

School burnout: Overcoming barriers to recognition, prevention, treatment, and policy adaptation

Edited by

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School burnout: Overcoming barriers to recognition, prevention, treatment, and policy adaptation

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The Perception of School Life From the Perspective of Popular and Rejected Students

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The experience of peer rejection in the classroom, an environment in which students spend a large part of their time, is accompanied by a sense of social pain which can have a profound effect on self-perception and attitude toward the overall school environment. These attitudes can be subsequently reflected in the student's behavior at school and in his/her school success. The research aims to identify differences in the perception of school life (interpersonal and intrapersonal) among rejected and popular upper-primary school students. For this purpose, the sociometric nomination method and a questionnaire measuring the student's perception of the school environment were used. From a total of 1,625 students (aged 11–15) from 20 schools, 312 students with the status of popular (liked) and rejected (disliked) were included in the research. The multivariate analysis of covariance (with age and gender as covariates) results revealed no significant differences between the two contrasting groups (popular and rejected) in terms of the perception of school life (interpersonal and intrapersonal). The results of the research indicated a different perception of the school environment *within* the groups of rejected and popular students rather than differences *between* the groups. Both the rejected and popular students report contradictory attitudes toward school life. Half of the students indicated that they feel lonely at school and have no confidence in teachers, considering the school a place where they do not like to learn, where they are troubled and where they do not like to talk to their classmates. Perhaps counterintuitively, a larger number of popular students stated that they feel lonely than did the rejected students from the class. Although the results do not paint a very positive picture of perceptions of the school environment, this should be seen as an opportunity to develop active class work with a greater emphasis on strengthening collective trust in the school.

Keywords: rejected and popular students, perception of the school environment, interpersonal and intrapersonal attitudes, peer rejection, upper primary school children

INTRODUCTION

School is one of the most important contexts for socialization and self-actualization among adolescents. The child-student needs not only the leadership of adults, but interaction with his/her peers, which also contributes greatly to social-emotional development. It is important that adolescents perceive the classroom peer context as positive and safe, i.e., they should feel

comfortable around their classmates, feel included in the group, and experience few conflicts in the class (Boor-Klip et al., 2016). Although the class peer group is not selected by the student, she/he must interact with group members on a daily basis (Mertens et al., 2021). Relations among peers develop progressively, with various peer groups evolving within a specific class hierarchy in which students take on the role of classmates. Peer group relations are fundamental in a child's development, affecting both school engagement and student academic achievement (Hurtado, 2018). Adolescents who feel that they are part of a school community are more likely to perform better academically and are more motivated in school; they are also less likely to engage in risky and antisocial behavior (OECD, 2017). Unlike other peer groups, the typical feature of a school class is non-selectivity. All members are putatively equal, sharing the advantages and disadvantages of daily school life together with the same rights and obligations (Rubin et al., 2015). In addition to the educational aspects, belonging to a class is a part of the student's social identity, with the class representing a social group that influences the socialization development of adolescents (Guan and So, 2016; Albarello et al., 2021). Since admission to a group of peers is generally valued by students, interactions within the collective greatly contribute to the development of specific social skills (Blažević, 2016). If a learner is accepted, she/he develops a sense of satisfaction and confidence through which self-esteem is built (Kulik and Kozieł, 2020). The position attained by the teens within the group then becomes an important part of their identity.

Group identity can represent a transitional phase which is often an intermediate step in the development of individual identity (Lage-Gómez and Cremades-Andreu, 2021). The various interpersonal relationships and social processes that occur in the classroom and other social spaces in the school shape the overall quality of the school environment. How students perceive, experience, and evaluate this environment can be influenced by their interpersonal relationships along with the position of the student in the classroom (Zandvliet et al., 2014). Although it can be assumed that the perception of the school environment will vary depending on peer preferences, we have relatively limited knowledge regarding how this perception of the school environment differs between rejected and popular students. Still, it may be assumed that a greater number of failed interactions with peers may cause lower social involvement as well as increased anxiety related to future social interactions, which in later years may also act as a barrier to career opportunities and the forming of other relationships.

PEER PREFERENCE AND PEER REJECTION

Peer preference is defined as the measure of the "like" or "dislike" of an individual or smaller group by a wider peer group. High peer preference has been defined by being liked by many peers and disliked by few; low peer preference is being liked by few peers and disliked by many. Peer preference differs from other peer constructs such as perceived popularity,

which focuses on social dominance and prestige rather than affective likes/dislikes (Parkhurst and Hopmeyer, 1998). Peer preference is an important aspect of relationships among children. In recent years, research in a number of disciplines has focused on peer rejection as a specific social phenomenon involving adolescent peer groups (Horn, 2003).

Research over the past two decades has highlighted the importance of peer rejection for the concurrent and subsequent adjustment of children. Rejection is a social phenomenon in which the main actors are the rejected child and the peer group, with the peer group shown to play a significant role in establishing and maintaining the status of the rejected child. Rejected children experience more negative expectations, behaviors, and interpretations of their actions than do other children (Coie and Cillessen, 1993; Milich et al., 1998).

Educators consider situations in which peers in the classroom reject a particular student to be but one aspect of normal social relationship formation (Smith and Brain, 2000). During schooling, children may find themselves in both the role of the rejecter and the rejected (Leary, 2001; Williams and Zadro, 2001). In one study conducted at the outset of the millennium, approximately one-third of young people reported experiencing some type of peer rejection (Deater-Deckard, 2001).

Social peer rejection is characterized by the avoidance of one member by most other members of the group (Townsend et al., 1988). A rejected child often serves as the group's scapegoat (a singular object of active bullying or ostracization) and is thus disliked or even hated by his or her peers. In contrast to the simple binary of rejected/popular, some authors suggest that social rejection by peers should be considered in terms of a continuum of dynamic social behavior ranging from full inclusion to complete exclusion (Leary, 2001; McDougall et al., 2001). The consequences of social rejection can be severe, and may be manifested immediately or only after a certain period of time, negatively impacting the psychological well-being of the rejected individual.

The negative consequences of peer rejection include severe psychological problems such as poor adjustment (Buhs and Ladd, 2001), low self-esteem (Storch et al., 2003), suicidal behavior (Paulson and Everall, 2001), criminal behavior (Miller-Johnson et al., 1999), drug use (Reinherz et al., 2000), and lack of social skills (Seng, 2001; Wolpaw, 2001). Further, the mere threat of social ostracism has been shown to increase depression and suicidal ideation in children and adolescents (DiFilippo and Overholser, 2000; Laible et al., 2000).

LONELINESS

Loneliness occurs most frequently during adolescence (Heinrich and Gullone, 2006) and is a common experience for children and adolescents (Parkhurst and Hopmeyer, 1998). A common feature of adolescence is that it carries the risk of perceived social isolation, a state which must be distinguished from objective isolation (Laursen and Hartl, 2013). At the beginning of adolescence, changes take place in what children expect from their peers and parents, with peer relationships growing

in importance (Parkhurst and Hopmeyer, 1998). A particularly significant finding is that loneliness has been shown to be higher in early adolescence than in later adolescence (Ladd and Ettekal, 2013).

Loneliness in children is influenced by how they are accepted by their peers, whether they have friends at all, the duration and quality of their closest relationships, and whether they are maltreated among peers (Asher and Paquette, 2003). Parker and Asher (1993) found that children without best friends are lonelier than children who report having a best friend. Low acceptance by peers contributes to a higher level of loneliness, although this is not synonymous with the absence of a close friend. McWhirter et al. (2002) report that social relationships are important in adolescence, as further evidenced by the findings of Chipuer and Pretty (2000) that adolescents more often experience social rather than emotional loneliness, i.e., the absence of a close relationship which fulfills the need for emotional attachment (a parent, best friend). In contrast, social loneliness represents a deficiency within a wider group (such as a peer group), i.e., it depends on the whole collective, not on individuals (Weiss, cited in Chipuer and Pretty, 2000). The basic trend in adolescence is that with increasing social support from classmates, the need for support from parents decreases (Hombrados-Mendieta et al., 2012).

Adolescents with poor or no social networks reported as being lonelier due to the absence of a group of friends with whom to engage in various activities as well as the absence of close, intimate friendships (McWhirter et al., 2002). It follows that psychological well-being during adolescence is influenced by the quality of peer relationships, a claim made by Hall-Lande et al. (2007) following their finding that social isolation is associated with an increased risk of low self-esteem as well as suicide attempts.

Demir and Tarhan (2001) found that among adolescents between the ages of 12 and 14, members of the rejected group of respondents were the loneliest. At the same time, the researchers compared this group with three other designated adolescent populations: a popular group, a controversial group, and a neglected group. In general, unpopular adolescents were rejected, while on the contrary, popular adolescents were liked. The students designated as neglected were those whom other peers overlooked completely, i.e., they were considered neither popular nor unpopular. The controversial group of adolescents was characterized by the fact that they were reported as popular with some peers and unpopular with others. Along with the unpopular adolescents, greater loneliness was indicated in the controversial group as compared to the popular group and neglected group. The investigators also offer an interesting explanation for this finding: being popular with some peers and unpopular with others can cause confusion and discrepancy. The child is aware of the instability in their peer relationships, and this confusion may cause greater loneliness for the members of this group, especially if the peers who like the child do not belong to the same reference group as does the child in question (Demir and Tarhan, 2001).

Peer status (as expressed by a peer preference score) in the classroom can play a key role in shaping the student's attitude

toward the school environment. The attitude to school determines how the student feels in this environment, e.g., as empowering or threatening to them (Kraft and Mayeux, 2016). Attitudes can significantly influence learning outcomes, the motivation for further learning and its perceived value as well as, finally, personal satisfaction and/or economic success in future life (Olalekan, 2016).

Our study follows other investigations based on the assumption that social acceptance, a condition which elicits positive emotions, is associated with positive perceptions of school life, while social rejection may be associated with negative perceptions of school life. Previous research has shown that school satisfaction is related to class climate and social acceptance. It has been found that school satisfaction is not determined solely by individual characteristics, but also to a large degree by class settings and structures (Verkuyten and Thijs, 2002). Research also points to a relationship between positive emotions and student satisfaction with school (Froh et al., 2008; Bordwine and Huebner, 2010). At least one study shows gender as a predictor of perceived school life, with boys scoring lower on school satisfaction than girls (GCR, 2021). Yet somewhat in contrast to these results, other research shows that gender and year of study significantly influenced the explicit school satisfaction of students, but not implicit satisfaction. In accordance with Wilson's Dual Attitude Model (Wilson et al., 2000), Tian et al. (2010) defined these two constructs of school satisfaction, with explicit satisfaction indicated in self-reports, and implicit satisfaction evidenced in automatic or unconscious processes. Further, implicit perceptions of school life may be more greatly influenced by social or personal factors rather than by individual factors (Tian et al., 2010).

RESEARCH AIMS

The research aims to determine how students with contrasting peer statuses perceive the school environment. The intention is to verify whether students who are rejected from the class group perceive the school environment more negatively than do their popular classmates. Taking into account gender and age, the aim of this study was to examine differences in perceptions of school life (interpersonal and intrapersonal) among upper-primary school children who experienced rejection from the class (i.e., with the peer status of a rejected student) and those who experience acceptance in the classroom (with peer status as a popular student). The research is based on the assumption that a contrasting peer status may be reflected in the perception of this environment, i.e., unpopular (rejected) students may perceive the school environment as more threatening than do popular classmates, and age and gender has no effect on this perception.

MATERIALS AND METHODS

Participants

A representative sample of 1,625 students from 20 upper-primary schools (6th–9th grade) in the Czech Republic was selected

TABLE 1 | Intrapersonal response rates for rejected and popular students.

School is a place...	Peer status	% yes, rather yes	% no, rather not
<i>where I like to learn</i>	Rejected	50%	50%
	Popular	52%	48%
<i>where I feel important</i>	Rejected	56%	44%
	Popular	57%	43%
<i>where I am often nervous</i>	Rejected	38%	62%
	Popular	48%	52%
<i>where I am happy</i>	Rejected	55%	45%
	Popular	54%	46%
<i>where I do not like being talked about</i>	Rejected	45%	55%
	Popular	51%	49%

for the research population. The selection was carried out randomly through a random number generator from all schools in the Czech Republic in the Register of Schools of the Ministry of Education, Youth and Sports. The sample included 849 boys and 776 girls aged 11–15 years (average age 13 years, $M=13.17$, $SD=1.287$). In the sample, 182 rejected students (11%), 130 popular students (8%), 27 controversial students (2%), 231 neglected students (14%), along with 1,055 (65%) other students were identified. Only students with the sociometric status of rejected (unpopular) and popular were included in the sample, for a total of $N=312$ students. All other students were excluded from the analysis. The research focused on the attitudes of two groups of students in the school class with the contrasting peer status of popular and rejected (unpopular). Comprising the group of rejected students ($N=182$), 63% boys and 37% girls were identified, with 60% of all these students in the lower grades (grades 6–7) and 40% in the upper grades of primary school (grades 8–9). In the popular group ($N=130$), 52% boys and 48% girls were identified, with 72% of students in grades 6–7 and 28% in grades 8–9.

Research Tools and Procedure

The questionnaire *School is a Place ...* (see **Tables 1** and **2**) was used to determine how students feel in the school environment. The student's social position (i.e., peer preference rate) in the classroom was determined using peer nominations as indicated in a sociometric-rating questionnaire.

The *School is a Place ...* questionnaire was designed as an abbreviated version of the original Students' Attitudes to School Life Questionnaire (Vojtova and Fucik, 2012) used in the previous researches (Hrbackova, 2018). The Czech version of the latter questionnaire was based on the Quality of School Life Scale—School Life Quality Questionnaire (Williams and Batten, 1981) as well as on the work of Binkley et al. (1996). The *School is a Place ...* questionnaire contains 10 items designed to identify how students feel in the school environment on two levels: in relation to others, i.e., the interpersonal level (five items), and in relation to themselves, i.e., the intrapersonal level (five items). The answers are expressed on a Likert scale of 1 (definitely yes) to 4 (definitely not). The results are expressed by an overall score of a minimum of 5 to a maximum of 20 points. The mean values of the calculated

TABLE 2 | Interpersonal response rates for rejected and popular students.

School is a place...	Peer status	% yes, rather yes	% no, rather not
<i>where can I turn to the teacher when I have a problem.</i>	Rejected	46%	54%
	Popular	51%	49%
<i>where I feel lonely.</i>	Rejected	53%	47%
	Popular	50%	50%
<i>where there is good fun during breaks.</i>	Rejected	47%	53%
	Popular	46%	54%
<i>where we like to talk to other classmates.</i>	Rejected	44%	56%
	Popular	47%	53%
<i>where I am troubled.</i>	Rejected	49%	51%
	Popular	44%	56%

score ($M=12.5$ points) represent ambivalent attitudes, with the higher the score, the more negative the students' perception of the school environment, and the lower the score, the more positive. Based on the principal component analysis, we have verified that both factors (interpersonal and intrapersonal) explain 50.17% of the variance. The interpersonal factor (1) explains 33.25% of the variance and includes five items with a weight factor of 0.63–0.88. This factor expresses how students feel in the school environment in relation to others, i.e., the student's feelings of closeness or openness to others. A higher score (min. 5–max. 20) expresses a greater degree of negative feelings experienced in the school environment and thus a higher degree of isolation and loneliness toward others. A lower score reflects more positive feelings experienced in the school environment and a higher degree of openness to others. A positive direction indicates that the school environment serves as a strengthening factor, while a negative direction indicates that the school environment functions as a threatening factor. The intrapersonal factor (2) expresses the students' feelings at school in relation to themselves. A higher score (min. 5–max. 20) expresses a negative experience associated with the student's perception of her/his own feelings in the school environment, with a lower score representing positive feelings experienced in the school environment. A positive direction suggests that the student perceives the school as an environment in which they feel good, i.e., the environment is perceived as empowering. In contrast, a negative direction suggests that the student perceives the school as an environment in which they do not feel comfortable or safe, i.e., they perceive this environment as threatening. This factor includes five items with a weight factor of 0.33–0.62 and explains 16.92% of the variance. Measured using Cronbach's coefficient, the internal consistency of all 10 items in the questionnaire attains a value of $\alpha=0.712$. McDonald's omega coefficient reaches $\omega=0.735$, representing a good measure of internal consistency (Cortina, 1993). The internal consistency for the intrapersonal factor reaches a value $\alpha=0.504$, $\omega=0.513$, and for the interpersonal factor reaches a value $\alpha=0.831$, $\omega=0.839$, which represents an acceptable level of reliability. The structural model provides a good model fit with the following indices: χ^2/df ratio = 0.918, $p=0.495$; GFI = 0.949; RMR = 0.074; CFI = 0.941; RMSEA = 0.069; PCLOSE = 0.063.

To determine peer status, a sociometric-rating questionnaire was used. The most widely used method to measure sociometric status is peer nomination, through which the participants are asked to nominate peers they like the most or the least. The measurement of sociometric peer status is based on the peer nomination items “liking” (e.g., acceptance) and “disliking” (e.g., rejection) by which peer status was determined. Unlimited nominations were used, and self-nomination was not allowed. The students were asked “Whom do you like the most?” (LM) and “Whom do you like the least?” (LL). They were also instructed to nominate classmates through a best-friendship question (“Who are your three best friends?”) as well as through an acquaintanceship question (“Who do you hang around with?”). The LM and LL items were used to calculate a peer preference index for each student according to the procedure of Coie et al. (1982), with the raw nominations for LM and LL ratings tallied, standardized, and transformed into a peer preference score. The rejected group consists of all students who received a peer preference standardized score of less than -1.0 , an LL standardized score of greater than 0 , and an LM standardized score of less than 0 . The popular group consists of all students who received a peer preference standardized score of greater than $+1.0$, an LL standardized score of less than 0 , and an LM standardized score of greater than 0 .

The data was collected from students during classes using paper–pencil assessment, with the students filling in the questionnaires based on the teacher’s instructions. The data was processed using the IBM SPSS program version 28. Firstly, descriptive statistical analysis was conducted, then to further analyze group differences the independent sample t -test and multivariate analysis of covariance (MANCOVA) was conducted (with age and gender as the covariates). The independent sample t -test was used to analyze the comparison of means regarding attitudes toward school of two independent groups (popular and rejected students). The MANCOVA was used to test the statistical significance of the effect of independent variable (peer status) on a set of two dependent variables (interpersonal and intrapersonal attitudes toward school life) after controlling for age and gender as covariates. In the MANCOVA analysis, Bonferroni alpha (0.05) corrections were used. To illustrate the results, simple frequency tables were used, with the results showing the prevailing distribution of attitudes toward school in the two contrasting peer groups (popular and rejected).

RESULTS

The results of the research in **Table 3** show that the rejected and popular students perceive the school environment very similarly both at the intrapersonal level ($p=0.108$) and interpersonal level ($p=0.470$). At the intrapersonal level, the rejected students scored $M=11.73$ points ($SD=3.098$), the popular students $M=12.25$ ($SD=2.345$). At the interpersonal level, the two groups of students with different peer statuses also achieved comparable results, with the rejected students scoring $M=12.87$ points ($SD=3.951$) and the popular students $M=12.46$ ($SD=5.138$).

The MANCOVA (with age and gender as covariates) results also revealed no significant differences ($p=0.137$) between the popular and rejected students with regard to interpersonal and intrapersonal attitudes toward school: Wilks’s $\Lambda=0.985$, $F(2, 270)=2.01$, $p>0.05$, $\eta^2=0.015$; gender, $p=0.651$; age, $p=0.410$.

On average, the perception of the school environment appears ambivalent in both groups (**Table 3**). Nevertheless, this result is due to the significant variance in the students’ responses (either positive or negative).

The response rates shown in **Table 1** indicate a different perception of the school environment within both groups rather than a different perception between the two groups of rejected and popular students. The rejected students as well as their popular classmates indicated that they experience similar feelings in the school environment. What is striking is the high percentage of students who perceive the school environment negatively, regardless of whether they are rejected or accepted among classmates. A total of 50% of the rejected and 48% of the popular students showed a tendency to dislike learning at school. 46% of the popular and 45% of the rejected students indicated that they perceive school as a place where they are not happy; 45% of the rejected students and 51% of the popular students reported to not like being spoken about at school. 48% of the popular and 38% of the rejected students indicated feeling nervous at school, and 44% of the rejected and 43% of the popular students reported not feeling important at school.

The student’s perception of the school environment in relation to others (interpersonal) tends more toward negative values (on scale ranging from completely positive to completely negative perceptions) than in relation to themselves (intrapersonal). The frequency of responses in **Table 2** shows that only 53% of the rejected students, but also 50% of the popular students indicated experiencing loneliness in the class. Similarly, communication with classmates was found to be unpopular with both groups, with 53% of the popular students from the class team reported not liking to talk to their classmates and 44% of rejected students from the class team indicating that they in fact like to talk to their classmates.

Partial responses show that 54% of rejected and 49% of the popular students indicated that they cannot turn to the teacher when there is a problem. 53% of the rejected and 54% of the popular students report that there is no fun during breaks, and 49% of the rejected students and 44% of popular students report that they suffer at school. These values are clearly unfavorable.

TABLE 3 | Perception of the school environment in rejected and popular students.

	Peer preference	Mean	SD	Std.
Interpersonal	Rejected	12.87	3.951	0.302
	Popular	12.46	5.138	0.467
Intrapersonal	Rejected	11.73	3.098	0.239
	Popular	12.25	2.345	0.214

MANCOVA (age and gender covariates) comparison of means scores showing no significant group differences: Wilks’s $\Lambda=0.985$, $F(2, 270)=2.01$, $p>0.05$, $\eta^2=0.015$; gender, $p=0.651$; age, $p=0.410$.

The differences among the responses of the rejected students from the class are also interesting. 50% of these students perceive school as a place in which they can learn. 56% of the rejected students feel important at school, and 55% of these students feel happy at school. 47% of the rejected students do not feel lonely at school, and 51% of these students do not perceive school as a place where they struggle. The rejected students even reported that “Breaks are good fun” (47% of students), and that they like to chat with their classmates (44% of students).

DISCUSSION AND CONCLUSION

The research results show no significant differences in the perception of the school environment between peer-rejected students and their popular classmates. The conclusions do not support the assumption that students rejected from the classroom perceive the school environment more negatively than their popular classmates, i.e., these designated groups perceive the school environment similarly. These findings are not consistent with research showing that peer status has a greater impact on school perception than does friendship, e.g., Osterman (2000) has published findings showing that children who are accepted by their peers are more likely to their classes and school in general. Similarly, Huebner and McCullough (2000) found that school satisfaction is related to the students’ assessment of how they feel about this environment in relation to the importance of the school, the school community as well as the interpersonal relationships experienced in this context. The fact that peer status does not seem to affect the perception of the school environment may be due to a discrepancy between implicit and explicit attitudes, a view which is consistent with the Wilson’s Dual Attitude Model (Wilson et al., 2000). It is possible that rejected students outwardly show explicit attitudes, with implicit attitudes tending not to be shown (which is to be expected given that these attitudes are often unconscious). Martín-Antón et al. (2016) report that some children have a privileged social status: “they are the preferred students, highly valued by their peers” (p. 2). Others simply get on well with others and have several friends. But there are also children who for various reasons do not fit in and are passively or actively rejected and excluded by their peers. This peer rejection is associated with the experience of social pain (Eisenberger, 2013), which activates various coping strategies to deal with rejection from the class (as a threatening situation). One of these strategies may be expressive suppression. Based on research findings on expressive suppression and pain empathy (Anderson et al., 2021), expressive suppression of pain expression faces was found to reduce neural representations of negative emotion. According to Hart’s (2014) Integrative Theory of Psychological Defense, self-deluding defense mechanisms are primarily motivated by a sense of insecurity characterized by the experience of vulnerability and a lack of confidence in one’s own ability to cope with threats. Uncertainty can arise from various sources, such as attachment relationships, self-esteem, or conflicts in beliefs.

Our research shows that regardless of peer status students perceive school life in contradictory ways. Our findings carry a number of disappointing implications. About half of students (regardless of their peer status) do not consider school to be a place where they like to learn, and more than half of the students would not turn to the teacher if a problem occurred. Almost half of the students are troubled at school; they are not happy and they feel lonely. More than half of the students do not consider school to be a place where they like to talk to their classmates and they do not view breaks as a time of good fun. The conclusions of other research surveys in the Czech context correspond with our results. The feeling of belonging to the school has weakened among Czech students from 2003 to 2012 (OECD, 2014). In 2015, the index of sense of belonging was the lowest among OECD countries (OECD, 2019). PISA (OECD, 2019) shows that 30% of students in Czech schools involved in their survey experienced some form of bullying several times a month. The research also indicates a link to online behavior. Students who report spending more than 6 h a day on the internet (about 26% of students) feel more comfortable alone, and they have lower expectations of continuing their education than do students who spend less time online (OECD, 2017). The percentage who report feeling like an outsider at school has increased on average in many countries between 2003 and 2015 (OECD, 2017).

Our research results show a different perception of the school environment *within* groups of rejected and popular students rather than differences *between* the groups as taken separately. The results in the responses of students rejected from the class are encouraging, as more than half of the rejected students still experience a sense of importance. Similarly, almost half of the rejected pupils feel happy at school. Almost half of the rejected students claim that they enjoy school breaks, do not feel lonely at school, and like to chat with their classmates. It is possible that rejected students do not perceive the school environment as threatening when compared with other environments which they encounter.

The basic mechanism of social exclusion from the class is mainly due to student diversity, i.e., students become excluded because of their specific differences from others (Harrist and Bradley, 2002). Bauman (1998) has defined the term *symbolic social exclusion*, a situation associated with the stigmatization of individuals stemming from stereotyped perceptions of differences seen as disadvantageous. In this context, the group of students rejected from the class group often includes children from socially disadvantaged backgrounds. From an existential point of view, family functionality can be fundamentally reflected in the assessment of the importance of other relationships, including the school environment (Zandvliet et al., 2014).

We did not find peer status to play a role in the different perceptions of the school environment. The statements from our student respondents indicate that half of them, regardless of their peer status, perceive the school environment negatively, especially in relation to others. This was a surprising and unexpected result. Judged by the negative valence of the responses, the school environment (especially at the interpersonal level) may be perceived as threatening. The incongruities in the statements among the

rejected students in the class seems interesting, with this ambiguity in the overall perception of the school environment leading us to several possible interpretations. It could be that rejected students are internally aware of their position in the classroom but outwardly deny this situation (a form of defense mechanism). Or they may fully acknowledge their situation and simply identify with it, which may largely be related to their level of self-esteem.

Our results suggest that regardless of social status, students generally perceive the school environment in very contradictory ways, a situation which does not provide a very satisfactory overall picture. These findings suggest that there is a need to identify the causes of pupil dissatisfaction toward school and take steps to alleviate the situation, e.g., by strengthening collective trust at school among all students (Forsyth et al., 2011). High collective trust can only be established in an environment which meets the student's basic psychological needs—autonomy, healthy relationships, ways of developing competence (Deci and Ryan, 2008). In such surroundings, students can develop their own independence and abilities (autonomy), establish and maintain meaningful interpersonal connections, e.g., by belonging to a class (relationships), and gain confidence by feeling that they do something well (competence; Adams et al., 2015). Such an environment can be described as a self-regulatory climate, i.e., a multidimensional interconnected system that affects the quality of social relations and positively influences the dynamics of the classroom as well as other environments (Adams et al., 2016). Collective faculty trust in students, collective student trust in teachers as well as “student-perceived academic emphasis” are prerequisites for establishing and strengthening a self-regulatory climate (Forsyth et al., 2011). These conditions can be crucial for transforming the school environment so that students perceive it as empowering (rather than threatening). As a positive perception of the school environment is strengthened, social relations among all school actors in the class develop in affirmative and constructive ways.

Some limitations of this study should be noted. First, the measurement of perceptions of school life was very specifically targeted. Although other areas of school life could have been considered, the research focused on finding out how students felt in the classroom in terms of interpersonal and intrapersonal relationships. Second, the research focused on two groups of students (the rejected and popular students) because of the contrasting status of students in the classroom. The research did not focus on the perceptions of all students and did not consider other sociometric statuses in the classroom. The two contrasting groups can be more revealing about perceptions of school life. Third, the partial results are shown using simple

descriptive statistics to highlight the prevalence of frequencies in the positive or negative direction. Finally, it should be emphasized that although the present study was based on an extensive research sample, the results may or may not prove generalizable beyond the Czech context.

In summary, two important findings can be emphasized. Firstly, the group of rejected students and the group of popular students were not uniform in their attitudes, thus problematizing the view that these two groups of students (whether they are the rejected student group or the popular student group) can be designated as homogeneous entities. Secondly, the attitudes expressed by the respondents toward school life cannot be explained by peer group preference. These outcomes highlight the need to work with the whole class together regardless of peer status.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethics Committee of Tomas Bata University in Zlín. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

The authors confirm contribution to the paper as follows: KH: study conception and design, data collection, analysis and interpretation of results, and draft manuscript preparation. ZH: theoretical concept of the article and theoretical background. Both authors reviewed the results and approved the final version of the manuscript.

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Psychological Strategies and Protocols for Promoting School Well-Being: A Systematic Review

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Physical, socio-economic, cultural and mental challenges faced by students have been associated with adverse impacts on school wellbeing, resulting in increased school dropout and deviant behaviour. This systematic review has analysed the present knowledge on factors associated with school dropouts to identify psychological interventions for promoting school wellbeing. A systematic search was done of the ScienceDirect, APA PsycINFO, Emerald and Google Scholar electronic databases. A hand-search was also done of the reference list of the included studies. The initial search resulted in 448 studies, and the search of the references list of the considered studies resulted in 28 more articles. The application of the eligibility criteria resulted in the inclusion of 38 studies in the review. The study established several factors associated with school dropouts and social deviance, such as school climate, school structure, and those defining social interaction among students. Mental and emotional health was identified as the main factor influencing school dropout and social deviance. A positive school climate should be the primary consideration for promoting school wellbeing. School administrations, teachers, and parents should collaborate to positively improve conditions in schools.

Keywords: wellbeing, school, dropout, deviance, addiction

INTRODUCTION

School completion rates have shown a marked improvement over much of the past century, rising from single digits at the turn of the 20th century (Ramsdal and Wynn, 2022). This shift has been associated with educational changes such as the standards movement in education, social activities and cultural changes. Nevertheless, the dropout problem has endured through these changes, even amid higher school completion rates (Dupéré et al., 2015). School dropout has considerable consequences, including perverse implications on employment, lifetime earnings, and health literacy. Students often fail to complete high school for complex reasons that manifest earlier in their lifetimes (Dupéré et al., 2015; Krane et al., 2016).

School dropout rates are linked to physical and mental problems, substance abuse, antisocial behaviour, negative school attitudes, low quality of education, parenting problems and family challenges (Ramsdal and Wynn, 2021). These factors can be shown to have an initial impact on school wellbeing, which often leads to school dropout. Nevertheless, the uniqueness of these factors necessitates a multifactorial approach for risk and needs assessment to promote the creation of interventions aimed at mitigating school dropout (Gubbels et al., 2019).

School dropouts self-report various reasons for leaving school, yet these do not accurately construct the picture of the underlying problem. It is usually difficult to establish a causal relationship between any single factor and the decision to quit school. However, preliminary studies have provided a framework that delineates the factors associated with students' individual characteristics and elements related to the institutional aspects of their families, schools and communities (Rumberger and Lim, 2008). The latter category encompasses school wellbeing, which is correlated to school dropout rates. According to Doll et al. (2013), dropping out is the culmination of a much longer process of leaving school, beginning long before the day that a student eventually ceases attendance. However, Doll et al. (2013) identified a different framework for the analysis of factors influencing dropping out of schools. The framework constitutes push, pull and falling out elements, and while each type of dropout antecedent has credence, pull factors demonstrated the highest rates (Bryk and Thum, 1989; Doll et al., 2013).

The key difference between push, pull and falling out factors is agency. In push factors, the school is the agent whereby a student is removed from school due to a consequence. In pull factors, the student is the agent, such that attractions or distractions lure them out of school. In terms of falling out elements, circumstances exist that neither the school nor the student can remediate, and as a result, the connection students have with school gradually diminish (Doll et al., 2013). Dropping out factors are associated with the characteristics of the individual students—their educational performance, behaviours, attitudes and backgrounds—as well as the characteristics of the families, schools and communities where they live and go to school. However, Rumberger and Lim (2008) determined that no single factor can entirely explain a student's decision to continue school until graduation.

According to Rumberger and Lim (2008), dropouts have higher rates of unemployment, lower earnings, poorer health and higher rates of mortality, higher rates of criminal behaviour and incarceration, as well as increased dependence on public assistance compared to graduates. Still, Drapela (2004) established that dropping out of high school has no substantive effect on later drug use. This relationship was assessed with two fundamental measures of association, zero-order correlations and partial correlations. Deviant behaviours such as post-dropout drug use, as measured by tobacco, alcohol, and marijuana consumption, were shown to have statistically significant but non-substantive relationships to dropping out among dropouts (Croninger and Lee, 2001; Drapela, 2004). According to Fernández-Suárez et al. (2016), alcohol abuse and substance use have direct consequences on individual characteristics related to deviant behaviours. Furthermore, significant dropout risk associated with poor mental health majorly occurs in vocational and higher education (Rumberger and Rotermund, 2012; Hjorth et al., 2016).

To address the dropout crisis requires a better understanding of why students drop out; however, identifying the causes of dropping out is extremely difficult (Rumberger and Lim, 2008). The dropout problem is considered a multifactorial phenomenon resulting in an emphasis on and development of school-wide multi-component interventions and strategies, mainly based

on school wellbeing research (Johansson and Uhnöo, 2019). School wellbeing constitutes factors relating to school characteristics, the school as an organisation, the school climate or culture, and the collaboration of professionals in the school. These factors include inadequate or inefficient disciplinary frameworks, poor academic climate and low school attachment, and conflicts. According to Gallup (2017), a significant solution to school dropping out would be for governments to allocate more funds to districts that report alarming rates. This intervention would attract higher-quality teachers to the area who, in turn, are better suited to motivate students to stay in school and complete their education.

According to Lee-St. John et al. (2018), drop out intervention strategies research should go beyond the typical school boundaries to mitigate dropout risk factors. Still, schools cannot achieve outreach independently and will require significant, meaningful and effective partnerships with community agencies. However, the barrier to research regarding dropout intervention strategies is that many interventions that can be comprehensively evaluated are narrow in focus and modest in scope. Moreover, complex interventions that address the comprehensive needs of students at risk of dropout can be challenging to study (Lee-St. John et al., 2018). The purpose of this systematic review is to examine the current state of knowledge regarding the risk factors associated with school dropping out and deviant behaviours and identify interventions used to prevent dropouts, as well as their outcomes and effectiveness.

METHODS

Literature Search and Reporting

This research paper has been reported based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2009 guidelines. A systematic literature searches until 27 March 2022 was carried out over multiple electronic databases, including PubMed, Google Scholar, ScienceDirect and CINAHL. A hand search of the reference lists of the studies obtained in the initial search was also conducted to maximise the scope of the data search. To ensure that the most cited and recently published articles were obtained, results on the first two pages of the databases were majorly considered. A list of terms was formulated for the research questions, and Boolean operators were used to group phrases and keywords. The following keywords were used in the search process: (“teacher-student relationship” OR “school wellbeing” OR “school climate” OR “student wellbeing”) AND (“dropout OR misbehaviour OR deviance OR defiance”); all the sources were published between 2000 and 2022.

Guidelines and Selection Criteria

To select relevant studies, several inclusion and exclusion criteria were formulated. The eligibility criteria were such that they allowed the comprehensive examination of psychological protocols and strategies that minimise social distress and promote school wellbeing, while ensuring the reporting of quality findings. The studies also had to focus on the students'

lives in school. Additionally, articles were also included if they reported on correlated factors associated to a student or a teacher. Consequently, studies were excluded if they did not include as participants were students or teachers, and if they did not empirically evaluate the relationships between factors in the school environment, dropout and social deviant behaviours.

The titles of the articles obtained in the primary search were analysed to ensure they discussed the subject under consideration. Following this process, the included articles were subjected to abstract screening, which resulted in the elimination of more articles. The articles included after the title and abstract screening needed to have answered the research questions. Subsequently, the remaining articles were then subjected to a full-text reading to examine their level of evidence and determine their significance in this systematic review.

Assessment of Methodological Quality

The articles were subjected to methodological quality assessment prior to the data extraction process; all the articles had to pass the criteria to be considered for data extraction. The assessment items were clarity in stating the research question, participant sampling method information, study design, data collection methods, data analysis, study limitations and comparison to the existing literature on the research topic. The studies also had to compare study findings with existing literature. Articles that comprehensively discussed these aspects and followed the criteria were considered high quality.

Data Extraction and Synthesis

Data from studies that passed the eligibility criteria were extracted into pre-defined descriptor tables. The tables collected information related to the following aspects: author, year, study design, number of participants, objective statement and study findings. Research findings were examined using a reciprocal translation approach and primarily involved considerations of psychological protocols and/or strategies for promoting school wellbeing.

RESULTS

Search Results

The initial database search yielded 448 citations and reference list search resulted in eight citations. The 244 articles that remained after elimination of duplicates were subjected to title and abstract screening. Finally, the application of the eligibility criteria resulted in the inclusion of 38 articles.

SUMMARY OF RESULTS

Results were organised according to the main themes emerged from the analysis of the included studies. Specifically, below are reported the risk and protective factors that were found leading to school dropout and social deviance in each article.

In addition to this, summary of results related to the interventions found were reported below (Tables 1, 2).

School Dropout

Studies that evaluated the risks of dropping out were Temple et al. (2000), Hess and Copeland (2001), Lee and Burkam (2003), Christle et al. (2007), Archambault et al. (2009), Lessard et al. (2010), Bergeron et al. (2011), Frostad et al. (2014), Austin et al. (2022) and Saleem et al. (2022). Different studies evaluated the effects of different school climate factors and student characteristics on dropout risks.

Student-Teacher Relationships

Most studies found a negative association between student-teacher relationships (STR) and the risk factor of dropping out (Lee and Burkam, 2003; Murray and Malmgren, 2005; Barile et al., 2011; Bergeron et al., 2011; Wang et al., 2013; Frostad et al., 2014; Littlecott et al., 2019; Song, 2021; Zheng, 2021). This means that in schools where there is a positive STR, there are low dropout rates. Some of the articles stated that STR did not affect dropping out directly. Lessard et al. (2010) stated that STR is related to a student's academic achievement and satisfaction levels, which are in turn associated with dropout rates. Also, a study by Wang et al. (2013) stated that STR was able to reduce dropout rates by mitigating the effects of negative peer pressure and conflicted parent-child relationships. It does not matter whether STR varies across school size and sector (Lee and Burkam, 2003), or if it has direct or indirect effects on dropout cases, what matters is that by using this research, education stakeholders can use STR as a measure of expected dropout rates. This association is significant, such that research done on the intention to leave came to the same conclusion (Frostad et al., 2014). Lee and Burkam (2003) also stated that positive relationships with staff and administrators was equally impactful as STR. Barile et al. (2011) went further and stated that evaluation of teachers by students led to a positive STR climate.

Academic Curriculum and Student Achievement

Students who achieved good levels of academic scores were reported as less likely to drop out of schools (Lee and Burkam, 2003; Lessard et al., 2010; Cittone and Villani, 2019; Hou et al., 2021). To explain the cause and effect of academics on dropout rates, Lessard et al. (2010) associated an increase in academic achievement to an increase in commitment by the student. Dropout rates are not only affected by the academic success of the student but also by the teaching curriculum adapted by the school. Lee and Burkam (2003) found that schools offering mathematics courses had 28% lower dropout rates. The aim of the school curriculum should be to keep students 'comfortably' busy by not overstraining them but also not giving them too much free time.

Another curriculum factor was the administering of preschool education to students (Temple et al., 2000). Students who

TABLE 1 | Study descriptor table.

Author and year	Study design	Region	Number of students
Archambault et al., 2009	Longitudinal study	Quebec, Canada	11,827 high school students
Bergeron et al., 2011	Case study	Quebec, Canada	2,360 secondary school students
Christle et al., 2007	Case study	Kentucky, United States	196 high schools
Frostad et al., 2014	Retrospective study	Norway	2,015 upper secondary students
Gottfredson et al., 2005	Retrospective study	United States	254 public secondary schools
Lee and Burkam, 2003	Retrospective study	United States	3,840 students
Lessard et al., 2010	Exploratory case study	Quebec, Canada	4,312 high school students (2,227 girls and 2,085 boys)
Wang et al., 2013	Longitudinal study	United States	1,400 students
Welsh, 2001	Retrospective study	United States	4,640 middle school students
Barile et al., 2011	Longitudinal study	United States	7,779 students
Hess and Copeland, 2001	Case study	United States	92 students
Kelly et al., 2021	Case study	Florida, United States	109 students
LaRusso et al., 2007	Retrospective study	United States	476 adolescent students
Loukas et al., 2006	Retrospective study	United States	489 students
Loukas et al., 2010	Longitudinal study	Central Texas, United States	476 adolescent students
Murray and Malmgren, 2005	Randomised control study	United States	48 African-American students
Ryan and Patrick, 2001	Longitudinal study	United States	233 students
Temple et al., 2000	Prospective study	Chicago, United States	1,159 African-American and Hispanic students
Piñeiro-Cossio et al., 2021	Review	European countries, United States and United Kingdom	10,357 students aged 7–18
Johns et al., 2019	Symposium	Chicago	40 experts bringing in the needs of schools and families
Marx et al., 2017	Review	Canada, United States, Northern Israel, New Zealand, Croatia and Southern Brazil	297,994 secondary school students
O'Reilly et al., 2018	Review	United Kingdom, Australia, USA, Sweden, Denmark, Germany, Ireland	9,700 students aged 5–19
Hou et al., 2021	Cross-sectional study	Australia	1,392 students aged 12.7–16.24
Gobat et al., 2021	Case study	Wales	22 secondary school students
Littlecott et al., 2019	Case study	Wales and United Kingdom	About 3,800 school students
Fernandez and Benner, 2022	Longitudinal study	United states	1,010 primary to second grade school students
Chan et al., 2022	Case study	California	55,383 first and second grade students
Saleem et al., 2022	Case study	United States	440 students university students
O'Donnell et al., 2022	Longitudinal study	United States	294 secondary school students
Austin et al., 2022	Interview	United States	75 students with an average age of 11.6 years
Coetzee et al., 2022	Interview	South Africa	22 students of the age group 10–15
Fu et al., 2022	Case study	China	496 teachers from special education schools
Salceda et al., 2022	Focus group	Spain	13 Teenagers age group 15–18
Tsukawaki and Imura, 2022	Ethnography	Japan	500 primary and first grade students
Cittone and Villani, 2019	Book chapter—review	Europe	Children in age preschool
Song, 2021	Review	Various Afferents	Not specified
Zheng, 2021	Review	Varies Afferents	Not specified
Hunter et al., 2022	Experimental study	Colorado	18 junior high school teenagers

received pre-school education had a 24% less risk of dropping out compared to those in the control group. The causal relation is that preschool education reduces grade retention, frequent school mobility and increases parental involvement.

School Structure and Organisation

Some of the school characteristics that were evaluated were race composition, gender composition, school size and sector. Christle et al. (2007) and Lee and Burkam (2003) both found that schools with a low-percentage of white students experienced reduced rates of dropouts. The reason for this is not well-known, but Welsh (2001) and Gottfredson et al. (2005), on the other hand, agreed that schools with higher ratios of African-American and Hispanic students had high levels of

misconduct. The level of misconduct was later on linked by Archambault et al. (2009) and Loukas et al. (2010) to levels of dropout.

Schools with high, very high and low number of students experience higher risks of child dropout (Lee and Burkam, 2003; Christle et al., 2007; Marx et al., 2017; Fu et al., 2022). Even though Christle et al. (2007) stated a statistically insignificant association, other reviews (Prevatt and Kelly, 2003; Christenson and Thurlow, 2004) found a relationship between school size and risks of dropping out. The reason given was that high population negatively affects academic achievement, STRs and social deviance for the students.

In analysing school structures, the issue of school policies came up in Barile et al. (2011), with policies like teacher evaluation and rewarding teachers were evaluated. The researchers

TABLE 2 | Study descriptor table.

Author and year	Objective statement	Wellbeing factor	Theme
Archambault et al., 2009	To assess the contribution of student engagement to school dropout	Students engagement and its specific dimensions	School dropout
Bergeron et al., 2011	To examine the association between STR and achievement motivation with a student's intention to dropout	Teacher–student relationship (STR)	Student's intention to drop out of school
Christle et al., 2007	To examine the relationship between school characteristics and dropout rates	School size, student body, student's ethnicity, academic achievement, attendance rate, suspension rate, school-law violation rate	School dropout
Frostad et al., 2014	To assess the relationship between social participation and motivation to leave school	Social participation	School dropout
Gottfredson et al., 2005	To explore the association between school climate characteristics and school crime and disorder	School's organisational characteristics	School crime and disorder
Lee and Burkam, 2003	To explore the relationship between a school's structure and organisation and a student's decision to dropout	Learning curriculum, sector and size, and STR.	Student's intention to drop out of school
Lessard et al., 2010	To analyse the relationship between students' school wellbeing and intention to dropout	Commitment, achievement, satisfaction	Student's intention to drop out of school
Wang et al., 2013	To investigate the relationship between STR and adolescent depression and misconduct	STR	Behavioural problems in students
Welsh, 2001	To explore the effects of school climate and student characteristics on school disorder	School climate and student characteristics	Behavioural problems in students
Barile et al., 2011	To investigate associations between teacher evaluation and reward policies, and student performance and dropout	STR climate	Effects of teacher evaluation and reward policies
Hess and Copeland, 2001	To investigate the relationship between coping strategies for stress and rates of finishing school.	Stress-coping strategies	Dropout rate
Kelly et al., 2021	To investigate the efficacy of psycho-spiritual education on school wellbeing and school climate	Mentoring program teaching psycho-spiritual principles	School wellbeing and perceived school climate
LaRusso et al., 2007	To examine the implications of a respectful school climate on student drug use and depression	School climate (support from teachers)	Student drug use and depressive traits
Loukas et al., 2006	To examine if the school climate is associated to adolescent conduct problems through school connectedness	School climate (interaction and competition among students and satisfaction with classes)	Student conduct problems
Loukas et al., 2010	To examine the contributions of early school connectedness to adolescent behaviour problems	School connectedness (social relations)	Student conduct problems
Murray and Malmgren, 2005	To examine the effects of increasing adolescent–teacher relationship	STR	Effects of improved STR
Ryan and Patrick, 2001	To investigate the relation between school social environment and students' motivation and engagement in school	Class social environment	Student motivation and engagement
Temple et al., 2000	To investigate the effects of participation in the Chicago Child–Parent Centre and Expansion Program on school dropout	Early childhood intervention	Problematic behaviour and dropout rates
Piñeiro-Cossio et al., 2021	To analyse interventions for the improvement of psychological wellbeing at school	Activities physics	Wellbeing school
Johns et al., 2019	To discuss the findings of the Symposium on Protective Factors for LGBTQ Students	School climate, supporting educators, student identity	Protective factors for LGBTQ students
Marx et al., 2017	To evaluate the effects of postponing the start of lessons to support health, education and wellbeing in secondary school students	Postponing the beginning of lessons	Start time of lessons and hours of sleep for increased wellbeing
O'Reilly et al., 2018	To identify those interventions that can support the promotion of students' mental health	Internal cooperation of the school community	School interventions for wellbeing at school
Hou et al., 2021	To improve wellbeing literacy to increase wellbeing	Literacy on welfare	Literacy and wellbeing at school
Gobat et al., 2021	For formative and pragmatic evaluations of the educational process to promote school wellbeing	Mapping of the socio-cultural and political contest	Promoting wellbeing through a restorative practice approach
Littlecott et al., 2019	For understanding the social interactions of school staff to foster student wellbeing	Interactions mediated by social networks	Role of school staff and social network on student welfare
Fernandez and Benner, 2022	To propose coping strategies to reduce the malaise resulting from discriminatory treatment in educational disparities	Coping strategies	Discriminations in educational disparities

(Continued)

TABLE 2 | Continued

Author and year	Objective statement	Wellbeing factor	Theme
Chan et al., 2022	To assess the support students receive and the perceived degree of wellbeing	Family, peer and school support	Support and wellbeing in school
Saleem et al., 2022	To assess the protective effect of racial-ethnic socialisation on ethnicity-related stress	Ethnic-racial socialisation	Ethnic-racial socialisation to reduce the negative effects of stress related to ethnic differences
O'Donnell et al., 2022	To test a longitudinal model of promoting confidence in adults and psychological wellbeing among adolescents	Positive expectations from adults	Promotion of student welfare through adult support
Austin et al., 2022	To evaluate the relationship between racial-ethnic connectedness and behavioural and emotional problems	Racial-ethnic connectedness	Effects of racial-ethnic connectedness on the wellbeing of African-American students
Coetzee et al., 2022	To evaluate the usefulness of mental health programs for reducing symptoms of anxiety and depression	Mental health programmes	Positive effects of mental health programs on symptoms of anxiety and depression in students
Fu et al., 2022	To study the relationship between social support, self-efficacy and the perceived wellbeing of teachers	Social support	Positive effects of social support on well being
Salceda et al., 2022	To analyse the effects of a Dialogic Literary Gatherings intervention on well-being and school performance	Meetings literary dialogical	Dialogic Literary Gatherings intervention to promote wellbeing and academic achievement
Tsukawaki and Imura, 2022	To assess the type of humour that has positive effects on students' mental health	Teachers' humour	The effect of teachers' humour on student wellbeing
Cittone and Villani, 2019	To allow the revision work carried out to identify the positive effect of psychomotor intervention on multiple areas of development	Psychomotor intervention	The positive effect of psychomotor intervention on movement, cognition and emotions
Song, 2021	To investigate the effects of teachers' optimism and effectiveness on student wellbeing	Optimism and effectiveness of teachers	The effect of teachers' optimism and effectiveness on student wellbeing
Zheng, 2021	To assess the importance of teacher support on student wellbeing	Quality of the STR	The importance of teacher support on student wellbeing
Hunter et al., 2022	To assess the effects of culturally rooted afterschool programmes on students' self-esteem, resilience and cultural identity	Cultural rootedness of planned afterschool programmes	The effect of culturally rooted afterschool programmes on students' self-esteem, resilience and cultural identity

cautioned against awarding achieving students to 'good' teachers, since this causes a negative STR environment. Furthermore, Lee and Burkam (2003) reported that public schools faced more dropout rates than private schools.

Student Emotional and Mental Health

Most governments in the world categorise education as a basic need; however, some school factors may hinder this requirement. The emotional and mental state of a student can be affected by factors within or outside school. Emotional wellbeing was evaluated in terms of school connectedness (LaRusso et al., 2007; Loukas et al., 2010; Wang et al., 2013; O'Reilly et al., 2018; Piñeiro-Cossio et al., 2021; Tsukawaki and Imura, 2022), family relations (Wang et al., 2013), loneliness (Frostd et al., 2014), and school engagement (Jimerson et al., 2003; Archambault et al., 2009). For example, in assessing students' frame of mind, Archambault et al. (2009), used three aspects of school engagements: a measure of how much students liked school, and affective and behavioural engagement. School engagement predicted dropouts with a statistically significant correlation ratio of 0.15.

Most researchers concluded that mental health was connected to conduct problems, which were in turn connected to dropout

rates. Hess and Copeland (2001) stated that students who sought more professional psychiatric help had a positive association with misbehaviour and were more likely to drop out of school. Emotional stability is an important aspect of a student's wellbeing.

Student Misconduct

Most studies associated dropping out with the increase in behaviour disorder (Hess and Copeland, 2001; Ryan and Patrick, 2001; Welsh, 2001; Gottfredson et al., 2005; Coetzee et al., 2022; Fernandez and Benner, 2022). There was significant positive association between dropout rates and law violation, suspension, and board violation rates (Christle et al., 2007). In the study by Hess and Copeland (2001), the researchers reported that students who showed high levels of stress had equally high levels of disorderly and risky behaviour involvement, and were more likely to drop out of school.

Social Deviance

There were a few studies that evaluated the causes behind social deviance and misbehaviour in schools, presented as follows: Hess and Copeland (2001); Welsh (2001), Gottfredson

et al. (2005), Murray and Malmgren (2005), Loukas et al. (2006, 2010), LaRusso et al. (2007), Gobat et al. (2021) and Chan et al. (2022). The reasons for behavioural problems in schools are school climate, student characteristics, and emotional and mental health of students.

School Climate

There are a lot of factors that define the school climate, as illustrated by Welsh (2001), Gottfredson et al. (2005), Johns et al. (2019) and Hunter et al. (2022). **Tables 3, 4** show the association between these factors and student behaviour deviance. Some of the most important factors that led to social misbehaviour are disrespect for student's views and perspectives, unfairness and lack of clarity in school rules, poor school administration, poorly organised schools, high number of students, and lack of morale by teachers (Welsh, 2001; Gottfredson et al., 2005). The lack of morale, means that teachers are less involved with students and do not teach out of passion and rather treat it as a job.

Students' Emotional and Mental Health

Students' misconduct are mainly results of emotional and mental issues. Issues like depressive traits (LaRusso et al., 2007), feeling of social isolation (LaRusso et al., 2007; Loukas et al., 2010), lack of interest in schools (Loukas et al., 2006, 2010) and high stress levels (Hess and Copeland, 2001).

School-Based Student Behavioural Characteristics

Apart from emotional issues, other student factors that promote misbehaviour are increase in age, high student retention rate, high ratio of African-American or Hispanic students, high ratio of male students and students spending more time in school activities (Welsh, 2001; Gottfredson et al., 2005; O'Donnell et al., 2022; Salceda et al., 2022). When students spend more time in non-academic activities, they have a lot of free time to indulge in breaking rules (Lee and Burkam, 2003).

Promoting Wellbeing in Schools

With regard to the interventions outlined in these studies, Murray and Malmgren (2005) examine the effects of an intervention aimed at increasing adolescent-teacher relationship, finding an improvement of the STR. Kelly et al. (2021) investigated the efficacy of a mentoring program based on psycho-spiritual education and aimed at enhancing school wellbeing and school climate. They found positive effects of psycho-spiritual education on school wellbeing and perceived school climate. Finally, Temple et al. (2000) investigated the effects of students' participation in the Chicago Child-Parent Centre and Expansion Program on school dropout, finding a decrease in in problematic behaviours and dropout rates.

DISCUSSION

School dropout could be defined as a multifactorial phenomenon (Johansson and Uhnöo, 2019) determined by several risk and protective factors that can hinder or enhance students' wellbeing and academic performance (Ramsdal and Wynn, 2022). The main aim of this review was to identify these risk and protective factors highlighted in literature to usually inform teachers, parents, the general public and interventions that can foster students' school engagement reducing drop out and social deviant behaviours.

From our results emerged that STR and students' emotions and mental health represents the main factors in predicting students' drop out and social deviant behaviours.

With regard to students' emotions and mental health the studies included in this review showed that the social wellbeing of students has an effect on the student's feelings of belonging to school (LaRusso et al., 2007; Frostad et al., 2014). In this regard, the social setting in a school should be able to mitigate negative emotions like feelings of incompetency, lack of involvement and dislike of schooling life, and consequently increase the commitment and interest to learn. In addition to this, Frostad et al. (2014) stated that loneliness, in contrast to other factors like gender, teacher support and academic

TABLE 3 | Show of associations between school climate, student characteristics and behaviour problems.

School climate and student characteristics	Behaviour problems				
	Offending	Misconduct	Victimisation	Avoidance	Feelings of safety
Respect for students	NA	NA	NA	NA	PA
School planning and action	NE	NE	NA	NE	PA
Fairness of rules	NA	NA	NA	NA	PA
Clarity of rules	NA	NA	NA	NA	PA
Student influence:	NA	NA	NE	PA	PA
Age	PA	NE	NA	NA	PA
Race (majority of students are non-white)	PA	PA	NA	NE	NE
Gender (majority of students are female)	NE	NA	NA	NA	PA
Involvement in school activities	PA	PA	PA	PA	NA
Positive peer associations	NA	NA	NA	NA	PA
Belief in school rules	NA	NA	NA	NA	PA

PA, positive association; NA, negative association; NE, no effect.

TABLE 4 | Show of associations between school climate and school disorders.

School climate	School disorders		
	Teacher victimisation	Student victimisation	Student delinquency
School size	PA	PA	PA
Gender (majority of students are male)	PA	PA	PA
Race (majority of students are African-American)	PA	PA	PA
Fairness in school rules	NE	NA	NA
Clarity of rules	NE	NA	NA
Psychosocial climate	NA	NE	NE

PA, positive association; NA, negative association; NE, no effect.

achievement, had the strongest associations with the intention to leave. From this review has also emerged that a positive school climate helps in mitigating the effect of negative family life and peer pressure. If students do not feel comfortable in school and at home, they are most likely to turn to friends who will mislead them into misbehaviour. Schools are thus responsible for the school crimes committed by their students; if schools provide the right climate by creating a positive STR, they will be able to reduce rates of students engaged in misbehaviour and misconduct.

Psychosocial factors negatively intervene in enhancing the relationships between dropouts and students' difficulty in managing educational issues (Finn, 1989; Kratochwill and Stoiber, 2000). Specifically, several studies on dropout, have highlighted the importance of relationships in school dropout processes (Ramsdal et al., 2018). Students who had been separated from their parents over longer periods of time, had struggled to find friends in school, had not supportive teachers, and had struggled with mental health issues reported higher levels of dropout and social deviant behaviours. In particular, positive teacher-child relationships were found to reduce the association between early mental health problems and school dropout (Holen et al., 2018). Relationships in general seem to play an important role in school dropout. Teacher support and loneliness, indeed, predict students' intention to leave school (Frostad et al., 2014).

Our review identified also other factors related to dropout and social deviance such as school organisation and structure, student individual characteristics and academic achievements. However, according to research that has explored students' perceptions about school dropout with qualitative interviews, the main challenge of these students is represented by the management of stress related to social situations associated with failure and humiliation (Ramsdal and Wynn, 2022). According to literature, it seems that they lack the necessary resources to cope with these social situation, and this contributed to prolonged stress and failure to maintain their educational goals (16, 17 and 29).

Finally, with regard to interventions outlined in the reviewed studies several important points could be highlighted. Murray and Malmgren (2005) recommended that teachers should be more involved with their students, while Kelly et al. (2021)

recommended the enrolment of students into programmes teaching psycho-spiritual principles of universal mind, consciousness and thought. They stated that the teachings improved the student's mental health. Temple et al. (2000) recommended preschool education to teach students about the importance of education and how to handle any education-related issues. In addition to this, schools should improve STR by establishing medium-populated schools (Lee and Burkam, 2003) and treating students equally, despite their academic success (Barile et al., 2011). The teachers should also be respectful to students and willing to regard a student's perspective instead of harshly discriminating their mental capabilities. Some schools should also reevaluate their school curriculum to exert just the right amount of academic stress on students. Social relations are an important part of any person's life, hence, schools should find a way of improving positive peer interactions. For instance, low achievers should stop being discriminated against, rather teachers should help them in their area of interest, be it music or arts. Schools should also improve the psycho-social climate in schools (Gottfredson et al., 2005). Professional help for emotional issues like stress and depression should be made readily available at school. Furthermore, this review demonstrates that mental health is important to a student's wellbeing (LaRusso et al., 2007; Archambault et al., 2009; Loukas et al., 2010; Wang et al., 2013; Frostad et al., 2014); hence, the school should provide readily available mental healthcare.

LIMITATIONS

The findings of this review should be interpreted in light of the limitations of our own work. Only assessed English-language literature has been assessed and may, therefore, significant findings reported in other languages have been overlooked. Although an exhaustive search was conducted, a relevant search term may have been omitted and consequently relevant studies may have not been retrieved. Finally, although we attempted to screen the retrieved studies thoroughly, it is possible that some salient studies were overlooked. Nonetheless, to the best of our knowledge, this review is the first to systematically review predictors of school dropout and deviant behaviours at school.

CONCLUSION AND IMPLICATIONS OF THE STUDY

Just like any other part of life, education has its own challenges. School wellbeing majorly impacts students' dropout rates and social deviance problems, with the causes being related to the school climate, STR to a great extent, the school structure and social interactions among students. Schools should know that their environments have a huge impact on the student's mental health, hence if preventive measures fail, treatment should be readily available.

To date, no single effect of interventions aimed at increasing school completion has been found to be explained by one

single factor within the various factors associated with the risk of dropping out of school, confirming the multidimensional nature of these variables (Ramsdal and Wynn, 2022).

This review aimed at reports on a number of factors that can affect a student's dropping-out rate and social deviance, in comparison most earlier studies that have only focussed on one factor, usually inform the creation of preventive and supportive interventions.

Future research perspectives could focus on the use of psycho-educational intervention protocols, not only in the school context but also in the wider community context.

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DATA AVAILABILITY STATEMENT

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found in the article/supplementary material.

AUTHOR CONTRIBUTIONS

PL: introduction and conclusion. All authors contributed to the article and approved the submitted version.

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Pupils' Adaptability at School, a Balance Between Demands and Resources?

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School burnout is affecting more and more adolescents. In order to develop appropriate preventative measures, the problem more than ever requires a detailed understanding of the mechanisms operating on students' capacity to adapt to circumstances rendered particularly difficult by the SARS-CoV-2 pandemic (COVID-19). In the absence of an explanatory framework in the field of school health, the JD-R model of work-related stress constitutes an original prism for reading the quality of pupils' adaptation to their school environment. The aim of this research is on the one hand to observe the predictive links between the different variables operationalized in the school JD-R model and on the other, to test the adequacy of this model against the data in schools acutely affected by the COVID situation. A total of 470 middle school, high school and 1st year BTS students agreed to participate in the longitudinal study. They were administered six scales spread over three measurement periods. The results of the predictive path analyses reveal that the hypotheses assumed are to a good degree verified. However, even if the model as a whole does not fit the data well, in their essence, the results point to the importance of strengthening students' own resources as well as those present within the school.

Keywords: secondary school students, demands and resources, school burnout, adaptation, health

INTRODUCTION

Stress has become the evil of the twenty-first century for working people. Unfortunately, it spares neither children nor adolescents for whom anxiety-related psychological distress has been steadily increasing in recent years (Kramer and Garralda, 2000; Kessler et al., 2007; Moghaddam et al., 2016).

Academic achievement and social networks are said to be the main culprits (Machillot, 2017). Indeed, we live in a performance society that values performance and parents have high expectations, which in turn creates pressure that can be a source of anxiety for a child who may fear disappointing his or her parents or being punished by them (e.g., Meylan et al., 2015; Lebert-Charron et al., 2021). Social networks can also be responsible for creating stress related to relationships and self-image, while the use of social media is reportedly correlated with appearance

anxiety, body image concerns and eating disorders in adolescence (e.g., Ponti, 2019). For some, it may even be a question of school burnout (e.g., Salmela-Aro et al., 2009). Assessing the physical, but also psychological and social health of adolescents in schools is now a priority (e.g., Botsas, 2019).

The article by Salmela-Aro and Upadaya (2014) presents an original approach not only to the determinants of students' coping skills within school but also to the consequences of burnout. For this study we have based our model of work stress on the resources that are potentially present (e.g., Hobföhl, 2002). Its primary focus is therefore neither the negative variables of the work environment where a degree of control is left to individuals (e.g., Karasek, 1979), nor the balance between efforts and rewards (e.g., Siegrist, 1996).

The model, called "Job Demands-Resources" (JD-R) developed by Demerouti et al. (2001) in the organizational field, makes it possible to examine the environmental causes of stress (the relationship between the level of resources and the level of demands) as well as its consequences measured in terms of burnout or quality of life at work such as satisfaction or engagement.

Job Demands and Job Resources

Job demands correspond to aspects of work requiring physical or psychological effort, adaptation capacities or adjustment or recovery strategies (e.g., work overload, interpersonal conflict, and job insecurity). They are defined as "those physical, social, or organizational aspects of the job that require sustained physical or mental effort and are therefore associated with certain physiological and psychological costs" (Demerouti et al., 2001, p. 501). They inevitably generate fatigue, and they are thus more related to the health domain. For example, "they are the most important predictors of burnout" (Bakker et al., 2014, p. 393). Job resources are more related to the motivational side (e.g., feedback, job control, and social support). They are defined as "those physical, social, or organizational aspects of the job that may do any of the following: (a) be functional in achieving work goals; (b) reduce job demands and associated physiological and psychological costs; (c) stimulates personal growth and development" (Demerouti et al., 2001, p. 501).

The JD-R model postulates that employees who cannot meet the demands of their work due to a lack, absence or over-subscription of resources, may find themselves in a burnout situation linked to exhaustion and/or disengagement. However, if they have significant resources, their exhaustion will be mitigated by the buffering effect of the resources on the workload (Bakker et al., 2003). They will be able to cope with the demands, their level of burnout will be reduced and their general satisfaction level improved (Bakker and Demerouti, 2007). According to the JD-R model, therefore, when job demands are high, extra effort must be made to achieve work goals and avoid a drop in performance (Schaufeli and Taris, 2014). On the other hand, when resources are high, they counterbalance the potentially deleterious effects of job demands. This research aims to transpose this model to the school environment in order to study the determinants of engagement and burnout.

Job Demands-Resources in the School Domain

Salmela-Aro and Upadaya (2014) four-wave longitudinal study investigates the applicability of this demand-resource model and specifically examines burnout and student engagement in schools. We base our research on this study. To our knowledge, it is the only one on this subject so far. At first glance, the model seems to offer a good representation of school burnout and its determinants. However, this test is only ecological and empirical, and would still need to be statistically tested against fit indices that evaluate the model's adequacy to field measurements. Moreover, if the proposed school JD-R model represents an innovative prism for analyzing what pupils experience and feel at school, it seems reasonable to suppose that it has the potential to capture issues at the heart of current events, such as the effects of the SARS-CoV-2 pandemic in a demanding school context. Indeed, the pandemic has reinforced the malaise already present in young people by encouraging the appearance of psychological distress (Gindt et al., 2020). The virus has in fact revealed and exacerbated the fragility caused in particular by isolation and confinement. Negative psychiatric consequences in adolescents have been revealed (Marques de Miranda et al., 2020). These alarming findings concerning young people's health make it more important than ever to take account of this social issue. The study by Salmela-Aro and Upadaya (2014) in this context seems essential: any consideration of the strategies to be deployed to prevent burnout among students and to increase their satisfaction needs to verify the relevance of a framework based on demands and resources.

Self-Efficacy

While students are likely to understand that a school institution will offer them resources that will help them meet the demands placed on them, it should also be recognized that they have their own personal resources. One such resource is their sense of self-efficacy (SE) (Bandura, 2006). This is defined as a student's belief in his or her ability to organize and execute any course of action required to produce a desired result (Bandura, 1997). In a school environment, a strong sense of self-efficacy results in a high level of motivation. It predicts academic success and has an effect on motivation in school (e.g., Relich et al., 1986). From a theoretical point of view, the question has been raised as to whether the feeling of self-efficacy is expressed in a global way or whether it is rather situation-dependent. Bong's (2004) work revealed that there are different kinds of SE, academic SE being distinguished from disciplinary SE. In the present study, the aim is to identify how a sense of academic efficacy, interacting with the demands and resources offered in school, can predict a variable related to motivation and commitment. A sense of SE also has an impact on health and burnout in both teachers (e.g., Maslach, 1982) and students (Salmela-Aro and Upadaya, 2014). In teachers, for example, a strong sense of SE will help focus their efforts on problem solving. On the other hand, when their sense of SE is weak, they are likely to avoid confronting a problem and withdraw into themselves, which in turn increases their propensity for burnout (e.g., Chwalisz et al.,

1992). The consequence of a strong sense of SE among students can be just as beneficial, i.e., negatively predictive of burnout. In contrast, a weak sense of SE positively predicts burnout (Salmela-Aro and Upadyaya, 2014).

Insofar as such a framework can be shown to be adapted *a fortiori* to the new challenges imposed by the health situation, the resources and demands initially perceived by adolescents in their school environment together with their own resources (in particular Self-Efficacy; SE), should have an impact on their capacity to adapt in terms of school burnout or engagement (see **Figure 1**). These would then influence the nature of the students' adaptation to the context and their general life satisfaction. When the environment is perceived as supportive and safe, the student would feel satisfaction. On the contrary, a context in which the pupil does not feel confident, or one which he or she perceives to be toxic or uncertain, would predict a negative adaptation that translates at the psychological level by stress or school phobia, and at the academic level, by absenteeism and a greater probability of dropping out.

OBJECTIVES

The aim of this research is to put the JD-R model to the test in schools inspired by the study of Salmela-Aro and Upadyaya (2014). Specifically, the study was scheduled over the duration of the Autumn term, which is known to be particularly challenging. In particular, it aims to observe in a three times measurement study the reality of the postulated predictive links between the different variables operationalized in the model presented in **Figure 1** (this in accordance with the original study); and then to test the general adequacy of the model against the data in a school context impacted by the COVID-19 pandemic. In line with the original model in work environments (e.g., Bakker et al., 2014; Schaufeli and Taris, 2014) or school environments (Salmela-Aro and Upadyaya, 2014), resources are assumed to positively predict engagement and negatively predict burnout. On the same theoretical basis, demands are assumed to positively predict burnout and negatively predict engagement. Personal resources (SE) are assumed to negatively predict burnout and positively predict engagement which is in line with the results obtained by Salmela-Aro and Upadyaya (2014). Moreover, burnout and engagement are presumed to mediate the relationships between Demands, Resources and self-efficacy, on the one hand, and negative adaptation and life satisfaction on the other. Finally, we also assume that resources and demands will not be correlated as studies in the school field have shown (e.g., Salmela-Aro and Upadyaya, 2014; Teuber et al., 2021) unlike those in the organizational field (e.g., Demerouti et al., 2001).

MATERIALS AND METHODS

Participants and Procedure

A total of 470 middle school (7th to 9th grade), high school (10th to 12th grade) and first year university students from

private and public schools in a single academic region, agreed to participate in the study. They were all volunteers, aged between 12 and 23 years (139 girls and 331 boys, $Mage = 15.7$ years, $SD = 2.12$) (**Table 1**).

In our country, in some schools it is possible to find boarders or half-boarders or day students. Boarding students are those who spend the week in school. They only go home on weekends and school holidays. Half-boarders are those who eat at school at lunchtime and go home every evening after school. Day pupils are those who don't eat at school at lunchtime and go home every evening. The time spent in school is therefore completely different between these different types of students (**Table 1**). In a traditional curriculum (without repeating a year), pupils are enrolled in secondary school from 11 to 15 years of age. From the age of 16 they enter either a high school, a technological high school or a vocational school. They can continue their studies at university or in the Senior Technician Curriculum, which also corresponds to a first year of university studies.

Questionnaires were administered in a paper-and-pencil format to students in various general, technological and vocational schools. The research project was initially presented to the school heads who agreed to participate and they in turn notified the students' families. Only those who agreed were asked to answer the different scales. Each participant was given a code to make their completed questionnaire anonymous. Measurements were made at three moments during the first term: at T1, at the beginning of the school year; at T2, at the end of November, which corresponds to the end of the first term; and at T3, just before the Christmas holidays. Six scales were administered, the details of which are given below. These three periods were chosen because they were intended to reveal how students could move from a situation of physical and mental freshness, just after the summer holidays, to a situation of fatigue due to the progressive increase in workload. Indeed, the second measurement time corresponds to the end of the teaching phases and the beginning of the revisions. The third measurement period, just before the Christmas holidays, corresponds to a traditional table-top examination phase in the school environment.

Measures

Six scales were administered to the participants for the purpose of the study during the Autumn term. Analysis of the data revealed good psychometric qualities for each scale. The administration of these scales was planned from September until the start of the Christmas holidays. At inclusion, T1, the following three variables were measured:

Demands/Resources

The tool used was the School Demands and Resources Measurement Scale called "EMERE." It is based on the JD-R model in education as developed by Oger et al. (2022). This scale is dedicated to the school environment (Oger et al., 2022) and is composed of two factors (study demands and resources). There are three items to assess the perceived level of demands (e.g., "I have to do my homework and be in class every day which requires a lot of mental effort"), and

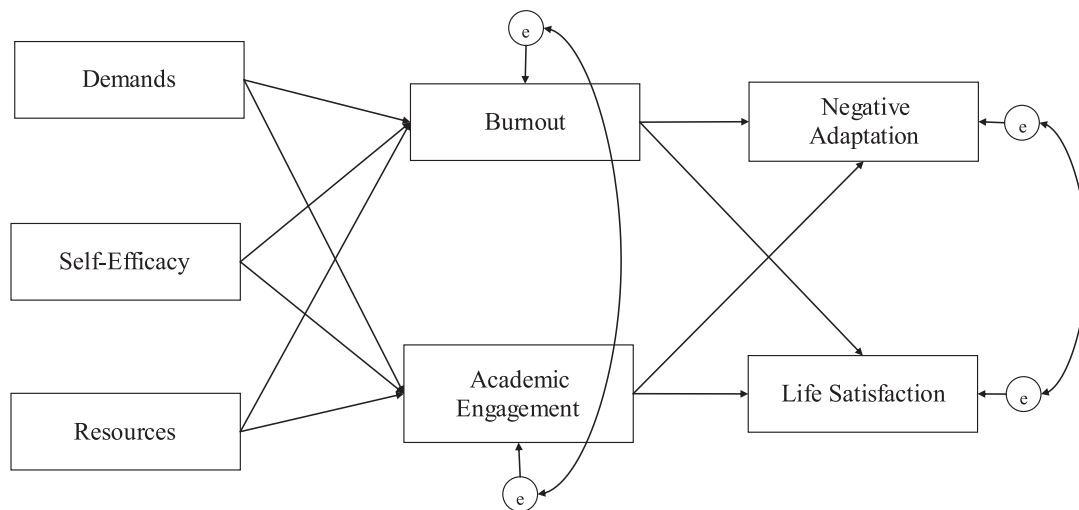


FIGURE 1 | The hypothesized model.

TABLE 1 | Descriptive data according to the school regime, to the gender and the type of schools.

School regime			Type of schools			
			Col	HS	THS	VC
1/2B	Gender	F	70	3	3	4
		M	59	5	7	70
	Total		129	8	10	74
DS	Gender	F	6	0	1	0
		M	1	1	0	17
	Total		7	1	1	17
B	Gender	F	0	21	10	11
		M	0	39	35	71
	Total		0	60	45	82
Total	Gender	F	76	24	14	15
		M	60	45	42	158
	Total		136	69	56	173

1/2 B, Half Boarder; DS, Day Students; B, Boarder; Col, College pupils; HS, High School; THS, Technological High School; VC, Vocational School; STC, students in Senior Technician Curriculum (1st year university).

three items on perceived resources (e.g., “I have moral support in my environment—boy/girlfriends, other students, teachers, educational counselors, supervisors, parents—when a difficult or stressful situation occurs”). Participants respond on a scale from 1 (strongly disagree) to 7 (strongly agree) according to the frequency with which the situations mentioned occur. The higher the score, the greater the perceived demands of the school on the student. For perceived resources, the higher the score, the higher the level. Finally, the greater the gap between the two (demands and resources), the more the imbalance is in favor of one or the other. For the EMERE, the construct validity is adequate (χ^2 , $p = 0.41$, CFI = 0.99; TLI = 0.99; SRMR = 0.045; RMSEA = 0.06) (Oger et al., 2022) and the internal consistencies in this study for the two dimensions are

satisfactory, with Cronbach’s alpha (Cronbach, 1951) and omega coefficient (Raykov, 2001) values of 0.71 and 0.72, respectively, for “demands.” For “resources,” the consistency is satisfactory with $\alpha = 0.69$ and $\omega = 0.74$.

Self-Efficacy

The tool used is the questionnaire developed by Masson and Fenouillet (2013). It measures students’ sense of self-efficacy in general at school, in French and in mathematics. Here, it is contextualized to middle or high school. The items were written in accordance with the recommendations of Bandura (2006). This scale comprises three sub-scales: a school SE scale, overall level composed of three items (e.g., “if the exercise is very difficult, I look for a way to find the solution anyway”); a French SE scale composed of four items (e.g., “I understand French exercises”); and a mathematics SE scale composed of four items (e.g., “I always manage to finish my math exercises”). Responses are given on a scale of 1 (Not at all true) to 6 (Totally true). This gives the overall school SE score that was calculated. The higher the score, the better the school SE. The scale showed sound construct validity (χ^2 , $p < 0.001$, CFI = 0.95; TLI = 0.93; RMSEA = 0.08) (Masson and Fenouillet, 2013). In line with the research question on the school environment in general and not on a subject-by-subject basis, only the “general” subscale was used. Accordingly, the two other subscales, in French and mathematics, were dropped. The internal consistency of the scale in this study was found to be satisfactory ($\alpha = 0.81$ and $\omega = 0.81$).

The items of the general SE were created “by ensuring that they refer to the individual’s belief in being able to organize and carry out a series of actions in order to succeed in a task. We therefore find here, on the one hand, the notion of competence and mastery but also that of controllability. Indeed, for a given task, the individual will judge to what extent he considers himself competent and he will also evaluate his ability to implement

strategies to become so” (Masson and Fenouillet, 2013, p. 382–387). In view of the object of the study, these are the items that were used here.

At T2, the following two variables were measured:

Burnout

The tool used to measure burnout at school is the one validated by Gauthier et al. (2010) for sport and school environments. It is the Burnout Measurement Scale (BMS), based on the Athlete Burnout Questionnaire by Raedeke and Smith (2001), following the recommendations of Cresswell and Eklund (2005). A scale composed of twelve items relating to the three components of burnout (physical and/or emotional exhaustion, low self-esteem and reduced sense of accomplishment) was validated, four items per component; for physical exhaustion (e.g., “I feel physically worn out by my days at college or high school”); for emotional exhaustion (e.g., “I have no idea what I’m doing,” “I don’t know what I’m doing,” etc.); for low self-esteem (e.g., “I don’t care about succeeding at college or high school, yet I should care”); and for accomplishment (e.g., “I feel that whatever I do, I don’t get the results I should”). For each of these, the individual answers on a five-point scale from 1 (never) to 5 (always). For school burnout, in accordance with the recommendations, a single burnout score was calculated: the higher the score, the higher the level of burnout (Raedeke and Smith, 2001; Gauthier et al., 2010). The scale showed sound construct validity (χ^2 , $p < 0.001$, CFI = 0.96; GFI = 0.95; RMSEA = 0.07) (Gauthier et al., 2010). In this study, the internal consistency was found to be satisfactory ($\alpha = 0.88$ and $\omega = 0.88$). The design of the scale allows it to be adapted to various types of contexts and audiences (college, high school, university) in accordance with the original version (Raedeke and Smith, 2001).

School Engagement

The Schaufeli et al. (2019) scale—the UWES-3, in its version adapted to the school environment (UWES-S)—was administered to participants. It consists of three items, each of which is based on one of three dimensions: “absorption” (e.g., “I am completely absorbed in my schoolwork”), “dedication” (e.g., “I am passionate about my schoolwork in college or high school”), and “vigor” (e.g., “I am overflowing with energy for my schoolwork”). Each item is rated on a Likert scale ranging from 1 (never encountered) to 7 (encountered every day). A high score indicates a high level of engagement in schoolwork. The scale shows sound construct validity (χ^2 , $p < 0.001$, CFI = 0.92; TLI = 0.92; RMSEA = 0.04; 90% ≥ 0.043 –0.045) (Schaufeli et al., 2019). In this study, the scale was found to be robust with good internal consistency ($\alpha = 0.89$ and $\omega = 0.89$).

At T3, the following variables were measured:

Life Satisfaction

Life satisfaction is a relatively stable cognitive appraisal of one’s life as it is subjectively perceived to be (Fenouillet et al., 2014). The scale administered was that of Fenouillet et al. (2014). It is the Multidimensional Students’ Life Satisfaction Scale (MSLSS) of Huebner (1994) in its French version. The questionnaire consists

of thirty questions relating to the themes of “family” (e.g., “I love spending time with my parents”), “friends” (e.g., “my friends help me if I need them”), “life” and “school” (e.g., “I learn a lot of things” and “I learn a lot of things in high school”), “the place where I live” (e.g., “I love the neighborhood where I live”) and “myself” (e.g., “I am a good person”). It “provides an adequate measure of students’ school wellbeing in the different contexts of the scale” (Fenouillet et al., 2014, p. 83). Responses are given on a scale from 1 (strongly disagree) to 7 (strongly agree). The higher the score, the better their satisfaction with life at school. The scale showed sound construct validity [$\chi^2(400) = 1081.02$, CFI = 0.93; TLI = 0.92; RMSEA = 0.07] (Fenouillet et al., 2014). In this study, the internal consistency of the scale as a whole was satisfactory ($\alpha = 0.92$ and $\omega = 0.93$).

Negative Adaptation

Negative adaptation is not a psychological construct but a sum of observations revealing how pupils adapt to their school environment and how they experience their schooling. In order to measure it, a scale has been developed. This is a composite scale constructed from indicators reflecting the extent to which a pupil is aligned with the school environment or shows signs of poor acclimatization (poor educational outcomes, attendance at the infirmary, absenteeism from class, college/school-related stress). The scale takes the form of 5 assertions (1- “I have good school results;” 2- “in recent months, I have often gone to the infirmary;” 3- I have been absent from class a lot in the last few months;” 4- “I feel stressed about school” and 5- “I like going to college”) for which the respondents are asked to evaluate their degree of agreement on a 5-point Likert scale. After reversing items 1 and item 5, all the scores were summed to obtain a single indicator of negative adaptation. The higher the score, the more negative is a pupil’s adjustment to the school environment. Finally, the results revealed internal consistencies within acceptable limits ($\alpha = 0.53$ and $\omega = 0.57$).

Data Analysis

Analyses were performed using the “lavaan” library available on the R software (version 3.6.2). Path analysis was performed using data from the variance-covariance matrix involving the variables of interest (see Table 2 with Pearson’s ρ correlation estimates).

Given the significant violation of the multivariate normality of the distribution between the variables (Mardia Skewness = 292.63; $p < 0.001$; Mardia Kurtosis = 5.46; $p < 0.001$), the Robust Maximum Likelihood estimator (MLR) was chosen to estimate the model and the standardized coefficients (β) of its different paths. To establish the general adequacy of the model, we relied on the interpretation of the Goodness-of-Fit indices with regard to the recommendations of Hu and Bentler (1999), i.e., absolute indices less than 0.06 or 0.08, respectively, for the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residual (SRMR), and incremental indices greater than 0.95 for the Comparative Fit Index (CFI) and the Tucker–Lewis Index (TLI). These benchmarks, understood as guidelines and values close to standards (e.g., CFI/TLI > 0.90; RMSEA/SRMR up to 0.10),

TABLE 2 | Variance-covariance-correlation matrix ($N = 470$).

	<i>N</i>	Mean	<i>SD</i>	1	2	3	4	5	6	7
1. Resources T1	470	16.3	4.1	16.85	0.01	0.10	0.23***	-0.20***	0.40***	-0.27***
2. Demands T1	470	13.0	4.2	0.25	17.70	0.02	-0.01	0.22***	-0.02	0.15**
3. Self-efficacy T1	470	12.8	3.1	1.34	0.21	9.75	0.35***	-0.35***	0.33***	-0.25***
4. Engagement T2	470	12.6	4.2	4.06	-0.10	4.64	17.98	-0.49***	0.48***	-0.43***
5. Burnout T2	470	30.1	8.6	-7.20	7.95	-9.37	-17.74	73.78	-0.48***	0.56***
6. Life satisfaction T3	470	159.6	25.2	41.78	-2.59	25.94	51.25	-103.37	634.65	-0.56***
7. Negative adaptation T3	470	10.3	3.2	-3.56	2.04	-2.54	-5.80	15.40	-44.75	10.17

Variance is displayed in the diagonal; Covariance and Correlation's coefficients are given, respectively, below and above the diagonal. Asterisk flag significant Pearson correlation coefficients as follow: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. The bolded values specified limits of the diagonal.

are acceptable insofar as the pattern of indices would converge globally toward a same conclusion (Jackson et al., 2009).

RESULTS

The Goodness-of-Fit indices show that the model as a whole does not fit the data correctly. Indeed, if the SRMR (= 0.06) and the CFI (0.91) are in the standards, the other indices are not acceptable with regard to the cut-offs, i.e., considering the robust Yuan-Bentler test, here significant $\chi^2(18) = 673.56$; $p < 0.001$, the TLI of 0.75 and the RMSEA equal to 0.149, CI95% (0.118–0.183) (Kenny et al., 2015). Despite the poor overall fit of the model, analysis of the local indices (path analyses and covariances) remains still possible.

The predictive paths are globally significant (**Figure 2**).

More precisely, demands ($\beta = 0.23$; $p < 0.001$), resources ($\beta = -0.17$; $p < 0.001$) as well as Self-Efficacy (SE) ($\beta = -0.34$; $p < 0.001$) at T1 predict burnout at T2. Burnout at T2 in turn predicts both "negative adaptation" ($\beta = 0.46$; $p < 0.001$) and life satisfaction ($\beta = -0.32$; $p < 0.001$) at T3. A significant covariance is observed between negative adaptation at T3 and life satisfaction at T3 ($Cov = -0.35$; $p < 0.001$). At the same time, SE and resources at T1, but not demands ($\beta = -0.01$; $p = 0.772$), predict engagement at T2 ($\beta_{SE} = 0.33$; $p < 0.001$; $\beta_{res} = 0.20$; $p < 0.001$). On the other hand, engagement predicts life satisfaction ($\beta = 0.32$; $p < 0.001$) and negative adaptation ($\beta = -0.20$; $p < 0.001$) at T3. There is at last a covariance between engagement and burnout at T2 ($Cov = -0.40$; $p < 0.001$).

DISCUSSION

This research was based on Salmela-Aro and Upadaya (2014) study, which reveals that the demands and resources related to both the environment (school) and to the students, determine their engagement with school and level of burnout. These in turn predict their levels of depression or satisfaction. In the present study, the aim was more specifically to measure the impact on adaptation to the school context and to satisfaction. The interest was twofold: on the one hand, to exploit, as previously (Salmela-Aro and Upadaya, 2014), an original reading of the mechanisms involved in the quality of life of pupils at school and their ability to adapt. On the other hand, it was to address a public

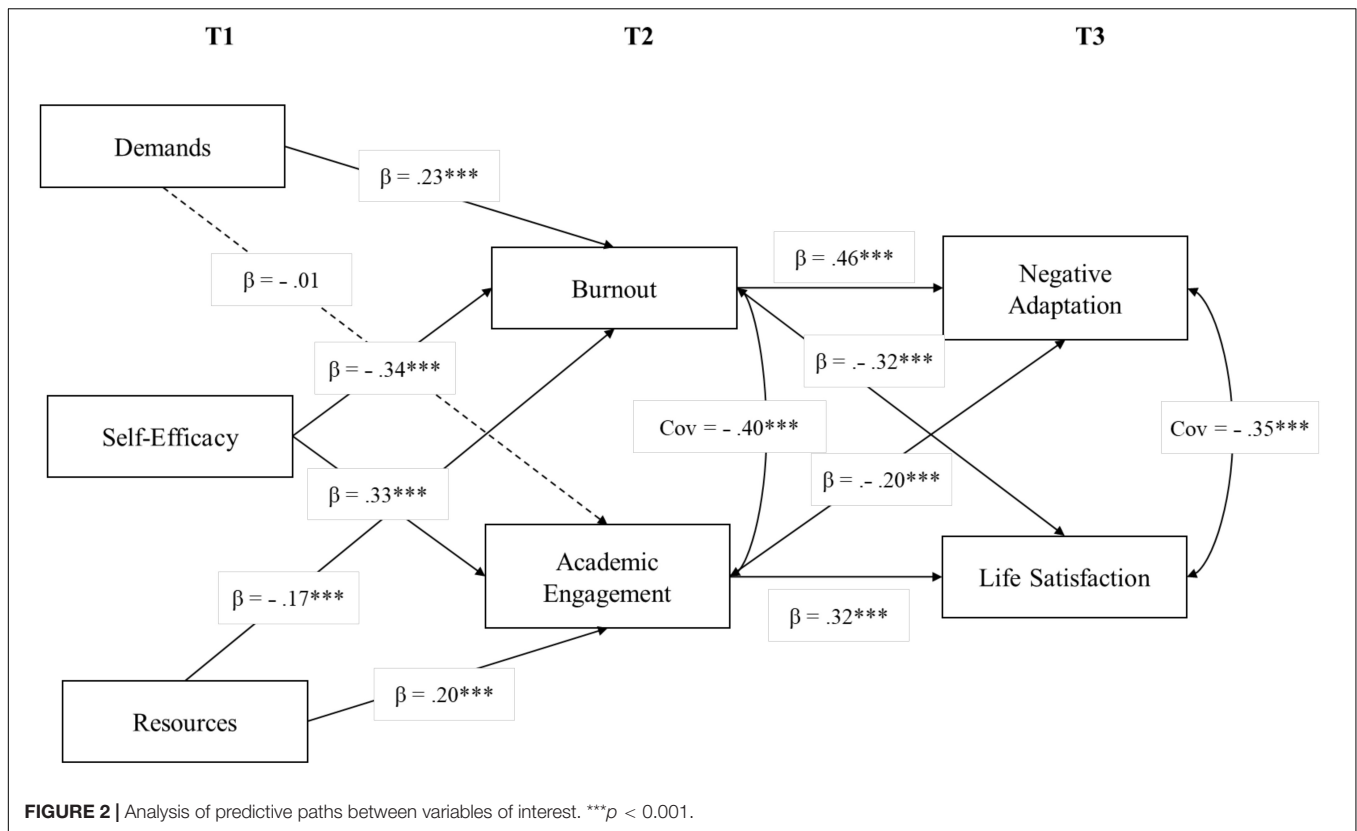
health problem that recent studies show to be increasingly serious amongst adolescents, particularly in this period of pandemic (e.g., Rolland et al., 2020; Jones et al., 2021; Stavridou et al., 2021). It is crucial to identify the mechanisms involved in order both to prevent a deterioration in adolescent mental health and then, if need be, to be able to manage it and promote a quality-of-life policy within schools.

Main Findings

The strength of the present study is that it was carried out according to a design with three measurement times, planned over 4 months (from September to December), making it possible to operationalize and test the temporal precedence of the predictors on the explained variables. Furthermore, this study involved a sample of more than 450 participants, another strong point with regard to the methodology adopted. In essence, the results obtained are in line with those of Salmela-Aro and Upadaya (2014), but in a school context marked by profound changes due to the pandemic. They reveal predictive links between the variables measured at three points in time, at the start of the school year, then 10 weeks later, at the end of the first term and finally just before the Christmas holidays. This period is traditionally a busy one for students and a potential source of dropout and dissatisfaction, depending on how they perceive the level of resources and demands. It is therefore clear that their perceptions will predict their overall level of satisfaction 2 months later. The level of demands perceived at the start of the school year, for its part, predicts exhaustion 10 weeks later. This level of exhaustion in turn predicts negative adjustment, which is negatively related to satisfaction. Overall, the model assumed in **Figure 1** was validated. Thus, the way in which students perceive the demands and resources at school from the beginning of the school year influences their overall wellbeing, either by altering it (negative adaptation) or, on the contrary, by promoting or reinforcing it (satisfaction). In the end, the results of this study reinforce and complement those of Salmela-Aro and Upadaya (2014).

Theoretical Implications

More specifically, the results reveal a link between student burnout and negative adjustment. Two alternatives can be considered in order to understand this. Firstly, they may suggest that students with burn-out would tend to be absent from classes



or school (drop-out) and feel unwell (stress), requiring more frequent visits to the infirmary. Exhausted, they would also feel less competent (e.g., Martin-Krumm et al., 2011) and would be likely to go to school less often. These results could also suggest that students seeking to avoid psychological discomfort would adopt avoidance strategies by fleeing the school environment through repeated absences or attendance at the infirmary. Burnout would be linked to a level of demands perceived at the outset by the pupils in their school environment to be greater than that of both personal resources (SE) and external resources (those of the school). Students who lack self-confidence, feel overloaded and think they cannot count on their teachers, peers or parents to help them when they need them, could easily find themselves in burnout and drop out in order to protect themselves. In the end, this strategy could be beneficial for them in terms of mental health, even if its consequences in terms of academic success are catastrophic.

Conversely, pupils with a high SE, who are able to organize themselves to manage their workload, and who perceive benevolence and possible support from those around them (peers, teachers, family, etc.) would tend to be more committed to school tasks. This engagement in turn impacts on their life satisfaction.

The results, determined from data gathered during a single term, make it possible to imagine that over a longer period of time the effects could be more pronounced, with an increasingly deleterious impact on demands. In itself, this would not necessarily be problematic as personal and environmental

resources increase over time. This possibility requires further study. The overall results confirm that indicators of student adaptation, such as engagement or satisfaction, are variables of interest in the exploitation of the model in the school environment (Oger et al., 2022).

Our study is intended as a contribution toward an evaluation of the JD-R model's external validity. Originating from work psychology, the JD-R model is increasingly being applied to the school domain since it aligns with the reasoning of Schaufeli et al. (2020) that "the activities of athletes, volunteers, and students can be seen as work, and hence, they may also suffer from burnout. Recently, it has been claimed that parents can suffer from burnout as well" (p. 5). It is therefore clear that the problem of burnout impacts on a wide range of domains. If the JD-R model proves to be functional in terms of primary prevention, then its potential application in the field of research is very broad.

The purpose of our study is then not to test the specificity of a school-based JD-R model so much as to add to the existing literature on its relevance in a school or student environment (Salmela-Aro and Upadaya, 2014; Oger et al., 2022; Salmela-Aro et al., 2022). On qualitative aspects, the specificity of the model is probably marginal to the choices children make. In a professional environment, employees have relative autonomy and develop a set of resources over the course of their employment history. The issues are not the same for children. They are "prisoners" of the system. Schooling is compulsory and they are dependent on their parents. To this extent a child has no choice and may feel that he or she is *subjected* to the school environment. The resources

available to children are mainly derived from the family unit and the school structure in which they live, while the same is true for the demands to which they must respond and adapt. A qualitative study conducted in both organizational and school environments would make it possible to identify the specificities of the two applications of the model.

Practical Implications

From a practical point of view, the results make it possible to envisage interventions designed to impact on both demands and resources with a view to limiting or reducing the negative effects of the former while favoring the development of the latter.

Intervening in demands in the school context means taking an interest in the workload that pupils are faced with (given amount of work, timetables, transport time, alternating school, and holiday times). The fear of failure, of disappointing or of not being up to scratch in assessments, tests and examinations is also mentioned when the demands of the institution are mentioned, since the results depend on the orientation, and therefore the future, in the mind of the adolescent. Orientation is therefore in itself a source of anxiety. On the other hand, the various pressures exerted by school heads on their teachers to respond to the competitiveness between schools (Shahmohammadia, 2011) and then, in turn, those of the teachers toward their pupils, is also part of the constraints of the school. These high demands create a psychological pressure that creates a climate of authority, order, effort and competition to achieve the best results at all costs, which is detrimental to the wellbeing of the student (Sarremejane, 2017). Finally, “strong family pressure at school, a potential source of conflictual parent-child relationships, can be conducive to the development of intense school stress which, in the long term, can lead to burnout” (Lebert-Charron et al., 2021, p. 64). In the end, a systemic vision of the problem should be envisaged, and it should not be left to the school alone, but to the educational structure as a whole. This applies not only to the school, but also to the family and the entire educational fabric in which the child is likely to be involved.

Mentioning resources in the school environment is tantamount to mentioning the support the students can receive from teachers who, for example, agree to take time to re-explain concepts outside the classroom, or whose encouragements reassure and stimulate (or restore) young people’s confidence in themselves. Mutual help between classmates may also provide support to a child as may the relationships within families: the support of parents and teachers is known to be a significant resource for the wellbeing of the pupil (Meylan et al., 2014). Knowing that young people can count on various actors in the education system (supervisors, school nurse and/or psychologist, etc.) with whom they can exchange ideas or obtain help is also an example of a resource. In terms of personal resources, we opted to deal with self-efficacy.

Taking into account this balance between demands and resources, tending either toward exhaustion and negative adaptation, or toward engagement and life satisfaction, provides some clues to improving the quality of adaptation of young people at school. Improving working conditions makes sense

here by also giving students the means to strengthen their own resources (e.g., SE, stress management, emotional management).

In view of the work that has been carried out in the organizational environment where the JD-R model has been shown to provide key elements for a primary burnout prevention policy (e.g., Demerouti et al., 2021), school deans could draw inspiration from it in order to establish a logic of health and effectiveness by considering motivation. Indeed, it may not be necessary initially to lower the level of academic demands; it may be equally effective to increase the scope of possible resources available to students (e.g., counseling, tutoring, extracurricular activities such as physical activity, drawing or music, a structure for welcoming parents, active pedagogies or school job-crafting schemes, etc.).

Strengthening Self-Efficacy at School

Given the impact of self-efficacy (SE) both on the quality of life of pupils at school and on their academic performance, it would seem vital that attention be paid to the different ways of supporting the available resources, particularly the support that teachers and parents can provide. It would be appropriate in this context to return to the recommendations of Bandura, for example (Bandura, 2007; Masson and Fenouillet, 2013). First and foremost, pupils should learn to capitalize on their mastery experiences. It is as important for them to learn from their mistakes, as it is for them to identify the resources involved when they succeed in tasks. On the other hand, providing opportunities for them to learn by watching their peers, would contribute to the reinforcement of SE. Verbal persuasion, i.e., encouragement, needs to be given special attention, especially qualitatively (e.g., giving “tips” for success in a task). Physiological and emotional states are of great importance, especially in negatively impacting on SE. They will be the subject of the next section. Finally, the integration of efficiency information should free teachers from having to think of learning as dependent on the completion of tasks of increasing difficulty. Indeed, pupils compare themselves to each other. When they fail in a task, if they notice that they are alone in having difficulties while their peers succeed, they are prone to blame themselves for their failure which in turn is likely to have a negative impact on their SE. If the task is problematic for all pupils, however, they are more likely to attribute the difficulty to the task and so avoid damage to their sense of SE. To conclude, it is worth emphasizing the importance of making available any information that may help students to succeed and so contribute to reinforcing SE. Let us return to the importance of physiological and emotional states.

Strengthening Stress and Emotional Management

Although it is sometimes forgotten, physical activity has been widely demonstrated to be relevant to stress management and emotional regulation, both in children (e.g., Ratey, 2008) and adults (Ratey and Loehr, 2011). Amongst other things, it helps prevent burnout (e.g., Isoard-Gautheur et al., 2019) and if promoted in school could provide primary prevention in the long term. Other types of action, such as the different programs of

emotion and stress management that have been developed for use in schools, deserve special attention. For example, Shankland and Rosset (2016) program is based, among other things, on mindfulness. The effects of this meditative practice have been widely demonstrated in the fields of physical and psychological health (e.g., Tomlinson et al., 2018), particularly in relation to primary prevention (e.g., Verdonk et al., 2021). It is in this perspective that mindfulness could be developed in schools, not only as a method of stress and emotion management, but also as a way to approach the problem of school burnout.

The aim, amongst others, is to provide examples of effective practice (see Martin-Krumm, 2021, for a review). This seems all the more urgent and crucial in the context of confinements.

LIMITATIONS AND PERSPECTIVES

A first limitation is statistical. Although the JD-R model adapted for schools taken from the study by Salmela-Aro and Upadaya (2014) has undeniable empirical validity—the predictive leads being consistent and significant in our study as well—it has to be said that the model as a whole only inadequately fits the data. Indeed, while the CFI and SRMR are good, this is not the case for the TLI nor for the RMSEA, which are more penalizing regarding sample size (Chen et al., 2008). This diagnosis may also suggest that: 1/the model is not parsimonious, in which case only the most essential predictive leads should be retained from a conceptual point of view (Gana and Broc, 2019); 2/the model is not good enough compared to the null model, due to the low correlations observed between certain variables of interest (thus reducing the incremental part of the model tested on the null model) (Kenny, 2020); 3/the model is not good enough because it omits to specify certain links that have a significant statistical weight (e.g., Satisfaction at T3 on Engagement at T2 or on Resources at T1 according to the modification indices of the model). However, such modifications improving the quality of the adjustment would not make sense given the temporality of the measurements (a variable at T3 cannot predict a variable at T1 or T2). Moreover, such a strategy to improve the fit of the model is not recommended (MacCallum et al., 1996). It may be recalled that poor overall fit of a model does not mean that it is invalid to interpret the local indices, just that a better explanation could be found to summarize the variance-covariance matrix (Gana and Broc, 2019). Correcting lack of fit involves rewriting the model to fit the data better, which was not our objective. That's why we have not attempted to address the problems with these issues but have sought rather to identify their source for further research. Apart from the possibilities already raised another reason for the results being not always satisfactory could be that our procedure includes incomplete features. This problem could be addressed by redesigning the procedure with the addition of key variables e.g., a test of the differential impact of age or gender through multigroup confirmatory factor analysis (MGCF) (Jöreskog, 1971). Those analyses will require adequate sample size. Finally, on the question of fit, we note that we lack a point of comparison, insofar as the main study by Salmela-Aro and Upadaya (2014) does not test the fit of the model.

Another limitation concerns the context of the research. As mentioned in the introduction, if some students are suffering at school, the current pandemic context reinforces this observation. In “normal” times, would the students' responses have been the same? Is the malaise accentuated? It is not possible to answer these questions, but it is important to be aware of them when reading the results of this study.

In terms of perspectives, it might be useful to consider either analysis taking into account the class level and to study the dynamics of the processes involved. Do middle school students perceive things differently from their high school counterparts? Is it possible to observe breaking points? If so, what countermeasures should be considered? Studies confirm, for example, the value of developing lessons on the importance of taking care of one's diet, engaging in regular physical activity, having a satisfactory quality of sleep (e.g., Tortella et al., 2021). A means to highlight the dynamics of the processes involved in a pupil's quality of life—indicators of wellbeing, of coping skills or, inversely, indicators of suffering—would make it easier to identify the key moments at which it is important to be vigilant. Similarly, it would make it easier to target potential interventions as part of a primary prevention approach. It could be of particular interest to follow cohorts of pupils, from their entry into 7th grade to their exit from the secondary system at the end of 12th grade. Such a study might help to identify the key points that lead the majority of students to persist in school while a minority drop out. How does the institution weigh on their decision to drop out? Does the demands-resources model provide some insight and, if so, how can dropout be avoided?

While in the organizational field resources and demands are correlated, in our school-specific study we found that these variables were independent (as other studies in this field have shown). We assume that this is related to the timing of the study. In both ours and Salmela-Aro and Upadaya (2014) study, measurements were taken at the beginning of the school year. It would be interesting to investigate whether the same independence between demands and resources exists at the end of the school year or whether, on the contrary, it is possible to make the same findings as in the organizational field.

Refining the analysis using a clinical approach based on interviews with students would make it possible to identify their specific needs and their expectations of the school environment. An analysis of the impact of this balance between demands and perceived resources on the quality of life at school, on adaptation and in turn on success, is another avenue to explore. It would allow recommendations to be formulated that aim at the health of pupils and avoiding school dropout. In this sense, this work is in line with the institutional logic that places “student wellbeing at the heart of education policy” (e.g., in France since November 2015)—all the more important in the context of the uncertainties linked to the enduring pandemic which reinforces certain ills. If, as Bezard and Rouquette (2019) suggest, “the first signs of mental disorders often appear at school or in the university training place (.) and 75% of psychiatric pathologies diagnosed

during the course of a lifetime began before the age of 24, then school-based prevention programs are of great interest” (p. 385). Shown to be of fundamental importance, mental health education can be envisaged through the knowledge and development of students’ resources.

CONCLUSION

The aim of our study, based on Salmela-Aro and Upadaya (2014) study, was on the one hand to test the JD-R model in a school environment, and on the other, to understand what may lead some students to be satisfied while others are suffering. The results obtained corroborate those of the original study. The present research carried out during the first part of a school year shows that over a relatively short period of time in relation to the whole of schooling, when pupils perceive high demands in their school environment, a problem of exhaustion may arise. This leads to avoidance behavior such as absenteeism, increased use of the infirmary and disengagement, which in turn leads to a decline in their life satisfaction.

In essence, these results corroborate previous work that suggests that an adolescent’s engagement in schooling promotes wellbeing (Pietarinen et al., 2014). The results reveal that the equation of “demands/resources perceived by students at school” must be in balance, or ideally tilted in favor of resources, in order for students to grow, learn, develop and flourish. The quality of a pupil’s adaptation needs to be taken into account not only from the perspective of academic success and prevention of school dropout, but also from that of the health of the child—the future adult—which is ultimately in line with the elements already highlighted by Lyubomirsky et al. (2005). The school certainly has its share of requirements in terms of rules to be respected and content to be learned, and this is fundamental:

it is part of its instructional and educational mission. But the school also has a formative role: to train the adult of tomorrow. This is only possible if the young person perceives a certain number of accessible resources conducive to their adaptation and feels confident. To act on this lever, knowing in more detail what pupils think, feel and experience at the heart of the school would be an asset in strengthening these resources. Examining this matter seems especially important in the light of the crisis we are experiencing today.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was provided by the participants’ legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

MO conducted the study and wrote the article. GB performed the statistics and contributed to writing the article. CM-K supervised the whole study and its design. FL and AM contributed to the data collection, data analysis, and discussion part of the article. CT made a significant theoretical contribution and participated in the writing of the article. All authors contributed to the article and approved the submitted version.

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Developing a CBT-Based Intervention Program for Reducing School Burnout and Investigating Its Effectiveness With Mixed Methods Research

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This study sets out to develop a cognitive-behavioral therapy-based psychoeducation application to reduce the school burnout levels of secondary school students and to test its effectiveness with the mixed methods research design. For this purpose, qualitative data have been included in the process at three different steps, before, during, and after the experimental application involving an intervention application. The application of the intervention of the research has been carried out with an experimental design with pretest-posttest control group, which is one of the true experimental designs. Experimental and control groups have been determined with 30 students reached by nested sampling method, and the CBT-based psychoeducation practice developed during the research process has been carried out for 9 weeks in the experimental group. During the research, descriptive analysis and content analysis methods have been used in the analysis of qualitative data, normality analysis, and One-Way Analysis of Covariance have been used in the analysis of quantitative data. Findings obtained from the study show that CBT-based psychoeducation practice is an effective approach in reducing school burnout. It has also been determined that the findings obtained from the analysis of the documents obtained during the application and findings from the interview process done after the application coincided with the findings of quantitative methods, and the qualitative findings adequately explain the quantitative findings.

Keywords: school burnout, cognitive-behavioral therapy, psychoeducation, mixed methods research, secondary school students (adolescents)

INTRODUCTION

School life has a unique quality in that it provides students with the environment and acquisitions they will need academically, socially, and emotionally (Wilson and Tanner-Smith, 2013; Kearney and Graczyk, 2014). On the other hand, problems such as school burnout, which arise due to both school-related and personal characteristics (Alarcon et al., 2011; Romano et al., 2020), limit students' acquiring those and using the facilities provided by the school (Seçer, 2015a). Although the concept of burnout is predominantly a problem area related to professional life (Maslach and Leiter, 1997), it has started to be associated with similar symptoms observed in students in recent years (Misra and McKean, 2000; Salmela-Aro et al., 2009b; Seçer et al., 2013;

Romano et al., 2020). Although being a student is not a job or a profession, it can be thought of as a “job” because its academic duties and responsibilities continue for many years and this process forces the cognitive, emotional and even physical resources of children (Salmela-Aro et al., 2009b). Children have many responsibilities such as attending school, doing homework and passing exams for most of the year. In addition, they are faced with the phenomenon of fulfilling the relatively high demands and expectations of their parents and teachers (Seğer, 2015b). Children may develop chronic responses such as being exhausted, developing negative attitudes toward school and school activities, and feeling inadequate (Schaufeli et al., 2002; Lee et al., 2010), decrease in academic achievement (Zhang et al., 2007) and losing ability to cope with the difficulties of this process (Romano et al., 2020) because of this ongoing responsibility and high expectations. These symptoms, which become chronic, also put pressure on the mental health of children (Misra and McKean, 2000; Gil-Monte, 2005; Seğer, 2015a). Thus, children may develop a meaningless and cynical affection toward school and eventually lose their satisfaction by seeing themselves as inadequate, useless and unsuccessful as a student (Salmela-Aro et al., 2009b; Walburg, 2014).

School burnout, which turns into an important pressure tool on social, emotional and physical health, is a problematic that consumes students’ available resources (Alarcon et al., 2011; Seğer, 2015b) and when it is not prevented, it has long-term and important consequences. It is argued that school burnout will cause secondary problems such as deterioration in social skills and interpersonal relationships (Yang and Farn, 2005), lack of empathy and health problems (Dyrbye et al., 2012; Mazurkiewicz et al., 2012), depression and anxiety symptoms (Salmela-Aro and Parker, 2011; Seğer, 2015a), sleep disorders, substance use and suicidal ideation (Nteveros et al., 2020) etc. as well as school problems such as decrease in academic achievement and dropping out of school. Therefore, it can be said that school burnout is an important mental health problem that threatens the students academically, socially and emotionally, and it is clear that if it cannot be prevented, it will have long-term and important consequences. So, it is thought that students’ positions need to be strengthened in order to effectively deal with problems such as school burnout throughout their educational life (Aypay, 2017; Seğer and Ulaş, 2020). Although the negative impact of school burnout on children’s social, emotional and physical health has been clearly demonstrated (Salmela-Aro et al., 2009b; Alarcon et al., 2011; Walburg, 2014; Seğer, 2015b), it is considered that the majority of the studies in the literature do not go beyond cross-sectional/survey nature and therefore contain an important limitation. In the literature, no intervention-based study has been found, and there are various model suggestions. Aypay (2017) suggested that practices that strengthen subjective well-being and future attitudes in young people can contribute to the prevention of school burnout. Romano et al. (2020) suggested that school burnout can be prevented by increasing emotional intelligence and teacher support and through reducing academic anxiety. It is considered that developing and implementing intervention practices for school burnout from the early stages of school

life will have an important protective function in terms of children’s mental health in the short and long term, and in this way, personal and academic achievements will be strengthened.

In this direction, Cognitive-Behavioral Therapy (CBT) is a frequently preferred approach in terms of intervention for various mental health problems related to adolescence. Along with the studies, it has been scientifically proven that cognitive-behavioral therapy is an effective approach to depression, anxiety, and avoidance in adolescence (Barrett, 1998; Verduyn, 2000; Kendall and Peterman, 2015; Rooksby et al., 2015). Ginsburg et al. (2008) found that a school-based CBT program was effective on anxiety. It has been found that CBT is an effective approach for improving social problem-solving skills in adolescents with behavioral problems (Matthys and Schutter, 2022), emotion regulation skills (Howells, 2018), and at the point of intervention in anxiety disorders in the context of anxiety sensitivity and emotion regulation (Asnaani et al., 2020). Hannan et al. (2019), on the other hand, evaluated that intensified CBT application in the intervention of school refusal, which is one of the school attendance problems, is promising in terms of increasing the time spent at school. In this context, the main purpose of the study was to develop a CBT-based intervention program based on the conceptual framework of school burnout and to test the effectiveness of secondary school students in reducing school burnout symptoms. According to this purpose, the research is based on the following questions and hypotheses.

Research question: “How do the qualitative findings obtained during the intervention (documents obtained from the students) and after the intervention (from the interviews) help in terms of explaining the quantitative findings of the intervention practice aimed at testing the psychoeducation program developed based on the interviews with secondary school students and the document analysis on school burnout?”

Research hypothesis: Psychoeducation application developed based on CBT is an effective approach in reducing school burnout in secondary school students.

The aims, questions and hypotheses of the research given above were designed with a mixed methods research process. In this direction, different qualitative and quantitative processes and stages were used simultaneously, sequentially and integrated in the process of both developing an intervention program and testing the effectiveness of the experimental procedure applied.

MATERIALS AND METHODS

Research Design

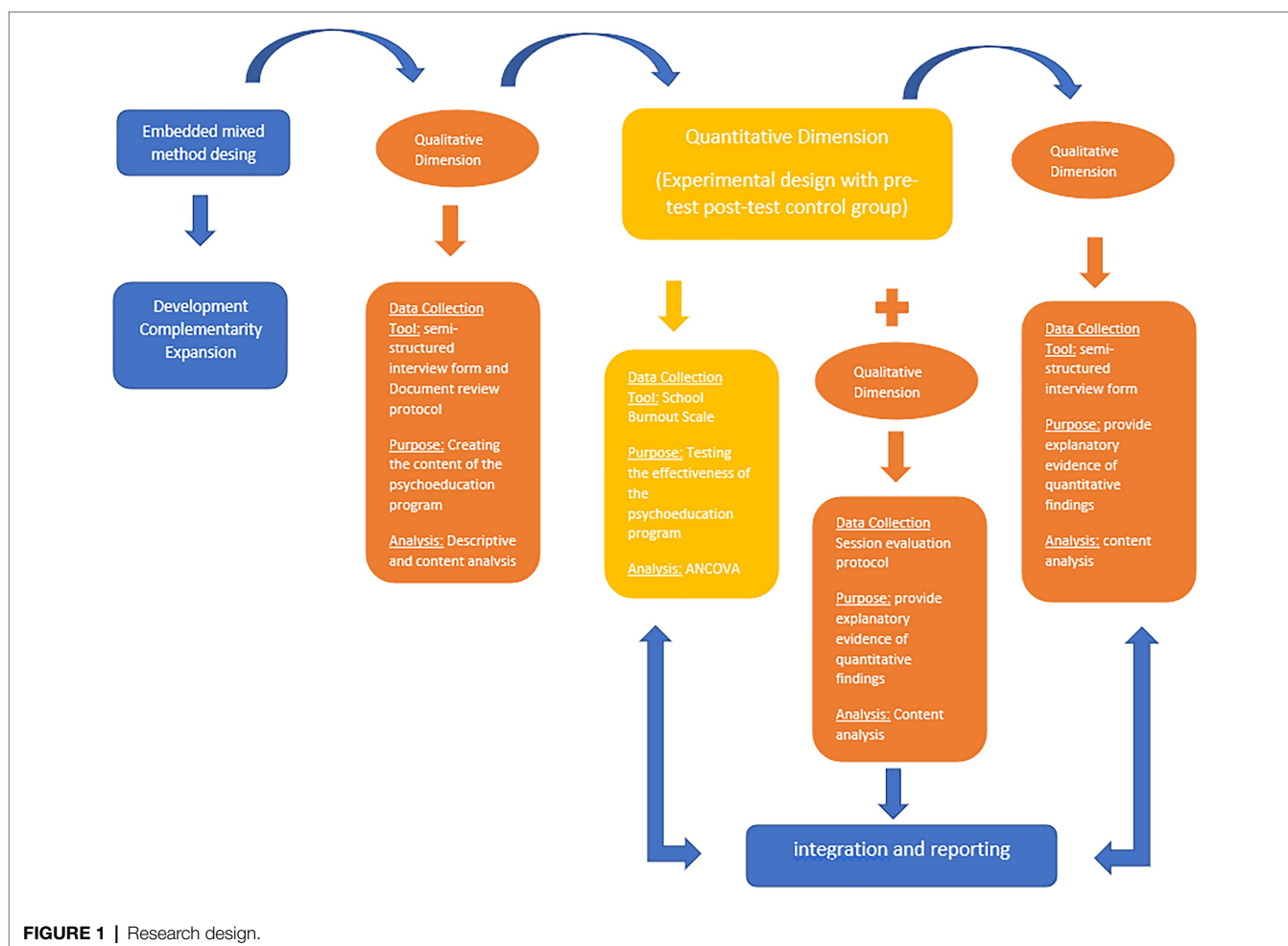
This study is a fully integrated mixed methods research. Accordingly, quantitative and qualitative approaches at all stages of the research interact with each other in a dynamic, dependent and repetitive manner (Tashakkori and Teddlie, 2003; Creamer, 2020). In this sense, it is aimed to base the study paradigmatically on pragmatism and accordingly, it was aimed to develop a psychoeducational application to intervene in the problem of

school burnout, which is frequently encountered in schools, to test its effectiveness and to explain the experiences in the process. In this context, the research process is as in **Figure 1**, and the steps followed in this process are as in **Figure 2**.

This research has *development, complementarity and extension rationales* among the mixed method research rationales. Rationale for *development* (use of findings obtained from a method in other stages and dimensions of the research) to form the content of the psychoeducation program; the *complementarity* rationale for the qualitative data collected during and after the experimental application and the quantitative findings obtained from the experimental dimension to detail and explain by the using findings obtained from the qualitative method; and the rationale for *expanding* the research using different research methods was used (Greene et al., 1989). According to Mason (2006), a qualitatively driven mixed methods approach has enormous potential for new ways to understand the complexity and contexts of social experiences. Therefore, in this research, a psychoeducational program was developed by referring to the views of students who experienced this phenomenon and the review of the literature in order to reveal the nature of school burnout. An experimental process with pre-test post-test control group was conducted to test the

effectiveness of the developed program. Meanwhile, students' evaluations in the experimental group for each session were obtained. With the completion of the applications, interviews were done with the students in the experimental group to explain their experiences in the 9-week psychoeducation process and to explain the findings obtained as a result of the statistical analysis of the pre-test and post-test applications. It can be said that the internal and external validity, credibility, transferability and verifiability of the findings obtained from the study are high, depending on conducting the study with a fully integrated mixed methods research (Mertens, 2019). Since the mixing points in fully integrated mixed methods studies should be clearly stated (Creamer, 2020), the mixing points of this study are as follows:

- Mixing in the writing of the basic research problem: "How do the data of the documents and interviews obtained from secondary school students help explain the results of the intervention trial aimed at developing a psychoeducational program and testing the school burnout of secondary school students?"
- Mixing in determining the research design: the research design was determined as a fully integrated mixed methods research,



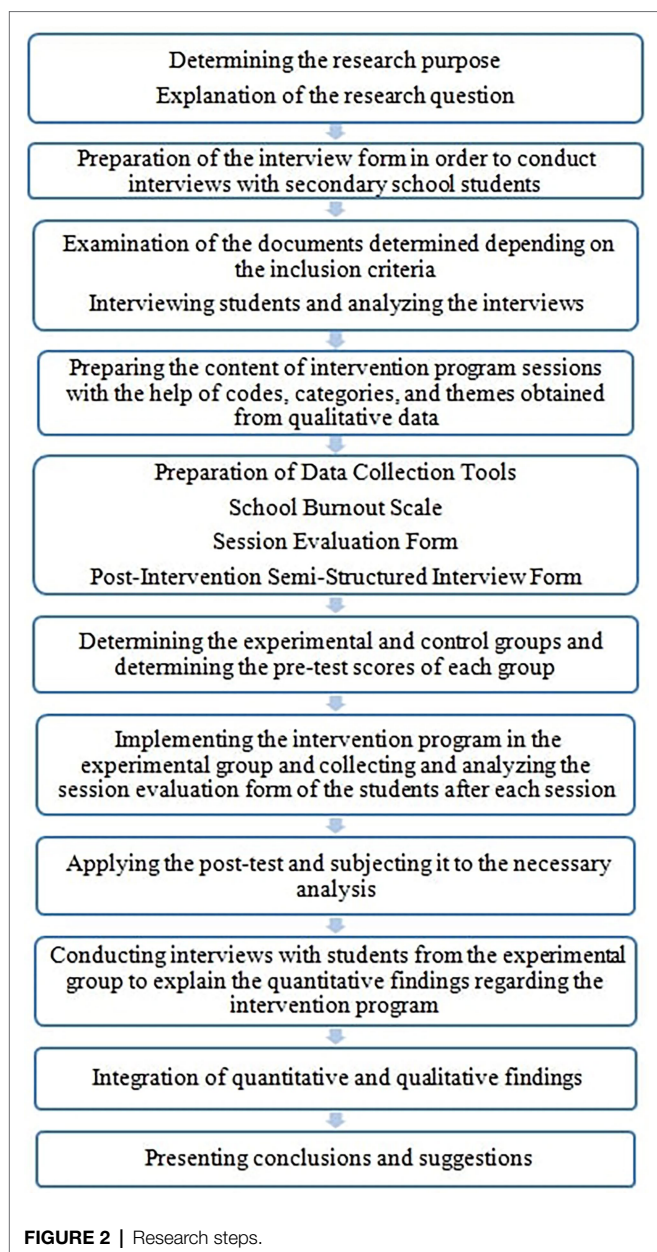


FIGURE 2 | Research steps.

and repetitive and interactive quantitative and qualitative approaches were preferred in the process.

- Mixing in data collection process: *Mixing was done during experimental application during data collection process.*
- Mixing in the sampling process: *Nested sampling method was used as the sampling method and qualitative data were collected from the group in which quantitative data were collected.*
- Mixing in the data analysis: *During the analysis, both qualitative data and quantitative data were mixed with each other and the analysis was completed.*
- Mixing in the interpretation and discussion: *Mixing was done after the analysis of the quantitative data of the experimental process and the qualitative data collected during and after the experimental process, and all findings were interpreted, integrated and discussed.*

In addition, the research was carried out with a mixed methods research priority rather than quantitative or qualitative method. Both a *concurrent* and a *sequential* process can be mentioned in data collection and analysis. There is a *concurrent* process in the development of the content of the psychoeducation program, a *sequential* process during the experimental application and a *concurrent* process after the process.

Study Group, Participants and Data Sources of the Study

The target population of this study is secondary school students who study in Erzurum province and experience school burnout, and the reason for choosing the adolescent students in the study group is to carry out an intervention process to prevent the negative effects of school burnout in the early stages. The research was initiated with purposeful sampling and interviews were conducted with 14 students who were determined to have school burnout before the psychoeducation application. In order to develop the content of psychoeducation, depending on the inclusion criteria, 8 theses and 44 articles are data sources for the document review step of the research. In the experimental process, nested sampling method, one of the mixed methods sampling strategies, was used (Creamer, 2020). Participants and groups were determined based on randomness. In this context, each of the experimental and control groups of the study consisted of 15 students, 8 boys and 7 girls, attending 7th grade. In addition, participants were selected among these students for the session evaluation forms collected during the experimental application (13 students) and the semi-structured interviews conducted after the experimental application (14 students).

The Validity and Reliability of the Research

One of the factors threatening internal validity in experimental studies is *sampling error*. This was prevented by the *randomness* in both the selection of the participants and the assignment of the groups. In addition, studies were conducted in two different schools to prevent the *interaction* of experimental and control groups. Considering the possibility of *subject loss*, the experimental and control groups were composed of 15 students each. To minimize the effect of participants' attitudes, which is another factor affecting internal validity, the principle of volunteerism was taken into consideration and the consent of both the family and the student for voluntary participation in the application was obtained. For the *statistical validity* of the study, the parametric test conditions of the collected data were examined and ANCOVA was done to determine the effectiveness of the intervention. The measures taken to increase the *construct validity* can be demonstrated by diversifying the theoretical and psychological framework of the psychoeducation program (McMillan and Schumacher, 2010). In addition, methods and data were diversified in order to control the *credibility* in qualitative processes. In addition, experiment fidelity was ensured in order to increase the reliability of the study, and any item

addition or removal that could affect the structure of the measurement tools used was not performed.

Data Collection Tools

Document Review Protocol

In the analysis of the studies determined to be suitable in line with the inclusion criteria determined within the scope of the study, the protocol developed by the researchers was used to include the author information of the studies, the year of publication, the status of the study as a thesis/article, the key concepts of the study, and the basic finding of the study and the process was carried out systematically by preventing possible data loss.

School Burnout Scale

The School Burnout Scale developed by Salmela-Aro et al. (2009a) was adapted into Turkish by Seçer et al. (2013) in order to determine the school burnout of students between the ages of 10–18. Exploratory and confirmatory factor analyzes were conducted to verify the latent structure of the scale and the structure expressed in the original form. A three-factor structure that explains 66.85% of the total variance was obtained as a result of the exploratory factor analysis. As a result of the confirmatory factor analysis, RMSEA=0.060, RMR=0.042, NFI=0.97, NNFI=0.97, CFI=0.98, IFI=0.98, RFI=0.95, AGFI=0.92, GFI=0.96 compliance values were reached and it was stated that these values were significant. It is a self-reported measurement tool in a 4-point Likert structure consisting of 9 items and 3 sub-dimensions. As an example of the items in the scale, “Lessons have started to seem meaningless lately”; “I feel that I am getting bored with the lessons” can be given. The internal consistency coefficient was 0.75, the split-half reliability coefficient was 0.72, and the test-retest reliability coefficients were 0.84 for the emotional exhaustion dimension, 0.83 for the depersonalization sub-dimension, and 0.83 for the low sense of personal accomplishment.

Semi-structured Interview Protocol

During the research process, two different semi-structured interview protocols were developed by the researcher. While the first was aimed at revealing the perceptions and definitions of secondary school students regarding school burnout before the intervention program. The interview form aims to determine the views and perceptions of students who experience school burnout. In this context, the researchers prepared an interview form consisting of 8 questions. As an example of the questions in the form, “Have you had difficulty in fulfilling your duties and responsibilities (homework, project, etc.) lately? If so, what do you attribute it to?, Have you had any recent changes in your interest in school? If yes, to what do you attribute this?, How do you evaluate your recent study time? Do you think you spend enough time to have fun and rest apart from this time?” is located. The interviews held within this scope lasted approximately 45 min.

The second semi-structured interview protocol was used to evaluate the intervention program and explain the quantitative

findings after the intervention program was implemented. In the development of both forms, necessary corrections were made by obtaining the opinions of both experts and peers. The interview form was used after the experimental procedure was completed. In this context, an interview form that was created to help explain the findings obtained after the quantitative analyzes were completed in accordance with the mixed method was used. An example question “Can you explain the reflection of the group experience you participated in your life?” It was used in individual interviews, which lasted an average of 10 min.

Session Evaluation Protocol

The session evaluation protocol used during the experimental process was also developed by the researcher, and the opinions of the students in the experimental group about the sessions were reached in writing. While developing the session evaluation protocol, both peer and expert opinions were consulted and when a consensus was reached, the form was finalized. In the session evaluation form, which consists of 5 questions, questions such as “How would you describe your general view of the session?, How did you feel” were asked and the answers were received in written form within an average of 10 min.

Process and Application

In order to carry out the experimental process, the School Burnout scale was applied to 8th grade students in two determined schools and the data obtained were analyzed. The opinions of the branch teachers were also taken for the students who were determined to have school burnout through the analysis. The families of the students, who volunteered to participate in the psychoeducation program, were contacted and informed with an informed consent form, and the necessary permissions were obtained from their families. With the determination of the experimental and control groups, a 9-week psychoeducation training was carried out in the experimental group, and guidance activities that were in the curriculum and not related to the dependent variable were applied to the control group. During the process, the students in the experimental group filled in the session evaluation protocols, and when the process was completed, semi-structured interviews were conducted with the post-test. Both a *concurrent* and a *sequential* process can be mentioned in data analysis process. In the first stage, both semi-structured interview data and document review data were analyzed with qualitative data analysis and a psychoeducation training program was developed. Measurements were made with the school burnout scale before and after the experimental application. SPSS 22.0 Package software was used in the analysis of the quantitative data obtained within this scope. Homogeneity, normality and extreme data analysis were performed to determine whether the data met the parametric test conditions. After determining that the parametric conditions were met, firstly independent samples t-test was conducted to determine whether there was a significant difference in terms of the dependent variable between the control and experimental groups. Secondly, Single-Factor Analysis of Covariance (ANCOVA) was done to determine whether there was a significant difference between

the post-test scores of the experimental and control groups after the experimental procedure. Content analysis was used for the depth analysis of the qualitative data obtained from the session evaluation protocols during the experimental process and from the interviews after the experimental process and to examine the relationships in more detail (Yıldırım and Şimşek, 2016). In general, the integration of the qualitative data collected in order to develop the psychoeducation content, and the mixing of the quantitative and qualitative data related to the experimental process were done.

The analysis of the pre-test in **Table 1** and post-tests in **Table 2** and evaluation of the experimental and control groups in terms of pre-test in **Table 3** are presented.

Tables 1 and 2 show the descriptive statistics and Skewness Kurtosis values regarding the pre-test and post-test applications.

When **Table 3** is examined, the pre-test scores of the experimental and control groups differ significantly [$t_{(28)} = -2.875$, $p < 0.05$]. Accordingly, it can be said that the experimental and control groups are not equal in terms of pre-test scores. In order to prevent this situation, which is thought to affect the internal validity of the research, from being a source of problems, Single-Factor Analysis of Covariance was used, which allows the analysis of the change in the post-test by keeping the pre-test scores under control.

Development of the Psychoeducation Program

In this study, a systematic psychoeducation program based on cognitive-behavioral therapy was developed to reduce the symptoms of school burnout of secondary school students. Cognitive-behavioral therapy is a therapy approach in which cognitive and behavioral techniques are used to develop an awareness of distorted thoughts and replace them with more functional thoughts (Sharf, 2015). In the development of this program, in the first stage, it was tried to determine the opinions and perceptions of secondary school students about school burnout by interview method in order to reveal the present symptoms of school burnout. The content of the psychoeducation program developed by combining the information obtained from the interview method with the themes emerging from the document analysis was determined. Briefly, in the intervention program design process, a literature review was first conducted for the conceptual framework of school burnout. At the same

time, interviews were conducted with students who were determined to show symptoms of school burnout. Findings from these two data sources were integrated. Cognitive-behavioral therapy is based on a therapeutic approach. In this context, the agenda and content were determined for each session. The final version of the program was given after the opinions of the field experts. The intervention process lasted for 9 weeks and there was no loss of subjects in the process.

As a result of the phenomenological study conducted to determine the content of psychoeducation to be used in the experimental stage, participants' perceptions of school burnout were grouped under three themes: *factors that predispose to experiencing school burnout*, *symptoms of school burnout* and *protective factors for school burnout*. The reasons that predispose to experiencing school burnout are discussed in three groups as *social factors*, *factors related to school* and *factors related to lessons*. Symptoms indicating that they experience school burnout were discussed in two sub-themes: *school-related symptoms* and *personal symptoms*. Participants' views on the factors that protect them from school burnout were discussed in four groups: *having social support resources*, *ensuring school-family cooperation*, *enriching the learning environment with various tools and teachers' positive attitudes and approaches*.

During the document review process inclusion criteria;

- ✓ Published in the last five years.
- ✓ Have open access.
- ✓ The publication language is Turkish or English.
- ✓ Publications in the Ulakbim index and National Thesis Center.
- ✓ Having the phrase school burnout in the title of the publication.
- ✓ Being accessible with "school burnout" as a key concept.

In order to develop the content of psychoeducation, 8 theses and 44 articles including theses published in the Council of Higher Education National Thesis Center in the last five years, which are open to access and articles published in journals that are included in the ULAKBIM index and have web archives and the term "school burnout" in the title of these publications and can be accessed with a keyword were determined as the data sources of the document analysis dimension of this study.

Descriptive information about the studies examined as data sources for the study is summarized in **Table 4**.

As a result of the analysis variables that were frequently addressed in school burnout studies between 2013 and 2018 were grouped under two themes: *variables related to psychological*

TABLE 1 | Pre-test descriptive statistics and skewness-kurtosis values of experimental and control groups on emotional exhaustion, depersonalization, low achievement perception, total burnout score.

Group		N	Median	Mean	Sd	Skewness	Kurtosis
Experiment	Emotional exhaustion	15	12.00	11.8	1.08	-1.10	1.94
	Depersonalization	15	10.00	10.13	0.99	-0.299	0.617
	Low personal achievement perceptions	15	7.00	6.80	1.14	-0.538	-1.05
	School burnout total score	15	30.00	30.06	2.25	-0.616	0.733
Control	Emotional exhaustion	15	11.00	10.66	0.617	0.312	-0.404
	Depersonalization	15	10.00	10.26	1.27	-0.103	-1.11
	Low personal achievement perceptions	15	7.00	6.66	1.17	-0.158	-1.47
	School burnout total score	15	32.00	32.00	1.30	-0.220	-0.628

experiences and variables related to academic experiences. Secondly, these variables related to both academic and psychological processes were categorized as negatively and positively related variables. Thirdly, it was discussed that school burnout has a predictive role for variables that are found to be associated with school burnout and which variables predict school burnout.

Integration of the Findings Obtained From the Interview Method and Document Analysis

From the interviews and the documents examined, it is found that the variables that play a role in experiencing school burnout are the effect of friends, teachers and family, the loss/lack of motivation, the intensity of the exams and the exam anxiety, academic motivation, alienation from school, depression, anxiety, academic stress, psychological well-being, school engagement, trust in teachers, ensuring school-family cooperation, teachers' positive attitudes and approaches, having a source of social support, academic self-efficacy belief, and self-regulation skills. In the findings obtained from the interviews, it has been determined that social support, teachers' positive attitudes toward students, ignoring students by teachers and the family's excessive expectations from the students, comparison in peer groups, intensity and complexity of the lessons, inability to use time efficiently, lack of motivation, doubt about the student's ability and potential, procrastination, forgetfulness, indifference, avoiding taking responsibility, enriching the learning environment with various tools and ensuring school-family cooperation have come to the fore and while social support, trust in teachers, competence beliefs, attitude toward school, and family's attitude coincide with document analysis, it was seen that psychological symptoms, need for psychological help, attachment styles, academic motivation, school engagement, metacognition, self-regulation, subjective well-being, depression, anxiety and educational stress were obtained from different data sources as different codes. Therefore, when the findings obtained from two different

data sources are integrated, the main elements that make up the content of the relevant intervention program are summarized as follows.

School burnout psychoeducation program session contents (Table 5).

RESULTS

Research Hypothesis: Psychoeducation application developed based on CBT is an effective approach in reducing school burnout in secondary school students.

In the process of testing this hypothesis, three main dimensions of school burnout were examined, as suggested in the relevant literature and included in the measurement tool. In the analysis process, analysis of covariance was used, and the equivalence of regression tendencies was tested as the prerequisite criterion of the analysis. Accordingly, the equivalence of regression tendencies is for emotional exhaustion [$F_{(1,29)}=0.159$, $p=0.693$], depersonalization [$F_{(1,29)}=0.143$, $p=0.708$] and low personal accomplishment [$F_{(1,29)}=0.239$, $p=0.629$]. Considering that the criteria suggested for all three dimensions were met, the experimental and control groups were compared separately for the three sub-dimensions. In addition, considering that the research was designed with a mixed methods research, each finding was mixed by indicating those obtained from different data sources altogether.

Analysis results regarding the emotional exhaustion dimension are given in Table 6.

When Table 6 is examined, it can be said that the cognitive-behavioral therapy-based school burnout psychoeducation program applied to secondary school students provided a significant decrease on the emotional exhaustion scores of the students in the experimental group [$F_{(1,29)}=5.327$, $p=0.029$, $\eta^2=0.165$]. Bonferroni test results showed that the results obtained in the post-test scores were in favor of the experimental group.

TABLE 2 | Post-test descriptive statistics and skewness-kurtosis values of experimental and control groups on emotional exhaustion, depersonalization, low achievement perception, total burnout score.

Group		N	Median	Mean	Sd	Skewness	Kurtosis
Experiment	Emotional exhaustion	15	8.00	8.13	1.50	-0.114	-1.30
	Depersonalization	15	7.00	7.66	0.816	0.740	-1.02
	Low personal achievement perceptions	15	4.00	4.00	0.654	0.000	-0.179
	School burnout total score	15	20.00	19.80	1.56	0.508	-0.534
Control	Emotional exhaustion	15	11.00	11.06	1.22	0.127	-1.03
	Depersonalization	15	10.00	10.33	0.975	0.276	-0.646
	Low personal achievement perceptions	15	7.00	6.60	0.633	0.547	-0.385
	School burnout total score	15	28.00	28.00	1.41	0.175	-1.35

TABLE 3 | Examination of school burnout pre-test scores according to experimental and control groups.

Group	n	X	SD	t	P
Pre-test scores	Experiment	15	30.06	2.25	
	Control	15	32.00	1.30	-2.875 0.008

TABLE 4 | Data sources of document analysis.

Author and publication year	Publication type	Keywords	Result
Burhan Çapri, Gülriz Yedigöz Sönmez (2013)	Article	High school students, burnout, psychological symptoms, attachment styles	As a result of the research, it was found that there were predictive relationships between burnout sub-dimensions, attachment styles and psychological symptoms.
Gülriz Yedigöz Sönmez, Burhan Çapri (2013)	Article	Student burnout, stress coping program, high school students	As a result of the research, it was found that the Coping with Stress Program had a permanent effect on reducing the scores of the students in the experimental group regarding the dimensions of emotional exhaustion and depersonalization.
İsmail Seçer, Sultanberk Halmatov, Fatih Veyis, Bünyamin Ates (2013)	Article	Burnout, school burnout, reliability, validity, scale adaptation	As a result of the research, it was found that the school burnout scale is a reliable and valid measurement tool for the Turkish sample.
Serap Kara (2014)	Master Thesis	Burnout, school burnout, psychological well-being, academic success	Result of the research, negative significant relationships were found between psychological well-being and school burnout.
Zekeriya Çam, Kaan Zülfiyar Deniz, Arzu Kurnaz (2014)	Article	School burnout, perceived social support, perfectionism, stress, structural equality model	As a result of the research, it was found that social support caused a decrease in school burnout scores; It was concluded that stress increased in perfectionist individuals, increased stress caused school burnout, and school burnout brought depersonalization with it.
Pınar Yeni Palabıyık (2014)	Article	Burnout, language proficiency, emotion, depersonalization	As a result of the research, no relationship was found between school burnout and English proficiency levels.
Eyyüp Akıl, Taha Yazar (2014)	Article	Prep class, student burnout, burnout scale	As a result of the research, it was found that school burnout differed significantly according to whether or not to come to the department voluntarily.
Filiz Bilge, Meliha Tuzgöl Dost, Bayram Çetin (2014)	Article	Academic success, working habit, high school students, school engagement, burnout, belief in self-efficacy	According to the findings obtained as a result of the research, if the students' self-efficacy belief is low, the level of burnout is high.
Kemal Avara (2015)	Master Thesis	Academic motivation, academic self-efficacy, career decision competence expectation, school burnout	According to the findings obtained as a result of the research, it was found that career decision competence expectation, academic self-efficacy and school burnout significantly predicted academic motivation. In addition, it was found that there is a negative and mediator relationship between school burnout and academic motivation.
Birkan Büyükarkan, Ulukan Büyükarkan (2015)	Article	Burnout, maslach burnout scale, science, graduate. education	As a result of the research, it was found that the dimension of emotional exhaustion was higher in graduate students who were in the course period.
İsmail Seçer (2015)	Article	School burnout, psychological adjustment, stress, structural equation modeling	As a result of the research, it was found that psychological maladjustment had indirect and direct effects on emotional exhaustion, depersonalization, and low personal achievement perceptions and predicted school burnout significantly in total.
Yalçın Özdemir (2015)	Article	School engagement, academic motivation, school burnout	As a result of the research, there were negative significant relationships between academic motivation and school engagement and school burnout, while a positive significant relationship was found between the time allocated for homework and school burnout.
Hakan Acar, Mehmet Ali Çakır (2015)	Article	Secondary education, school burnout, burnout	As a result of the research, it was found that the school burnout levels of secondary school students differed significantly according to their housing status, gender, monthly income of their families, and the field they studied.
Lokman Koçak (2016)	Master Thesis	Burnout, school burnout, depression	As a result of the research, it was found that there was a significant and positive correlation between anxiety and depression and school burnout; anxiety and depression were found to be significantly predicted by school burnout.
Hatice Özgen (2016)	Master Thesis	University students, school burnout, need for psychological help	As a result of the research, a significant and positive relationship was found between the need for psychological help and school burnout.
Servet Atik (2016)	Doctoral Dissertation	High school students, academic achievement, trust in teacher, attitude towards school, school burnout, alienation from school, structural equation modeling	As a result of the research, it was found that distrust in teachers affects school burnout negatively and directly; it has been revealed that school burnout is positively affected by alienation from school, and negatively and significantly affected by students' attitudes towards school. In addition, it was found that school burnout had a negative effect on their academic achievement.

(Continued)

TABLE 4 | Continued

Author and publication year	Publication type	Keywords	Result
Medina Akpınar (2016)	Master Thesis	School burnout, academic stress, subjective well-being, mediation relationship	As a result of the research, it was found that school burnout has a full mediator role between academic stress and subjective well-being.
Zeynep Banu Gündüz (2016)	Master Thesis	Parental attitude, self-esteem, school burnout, secondary school students	As a result of the research, it was found that the students who perceived their parents' attitudes as authoritarian and protective had a decreased self-esteem and increased school burnout levels, while the students who perceived their parents' attitudes as democratic increased their self-esteem and their school burnout levels decreased.
Şahin Kapıkıran, Metin Yaşar, Necla Acun Kapıkıran (2016)	Article	Self-esteem, school burnout, self-regulation, high school	As a result of the research, it was found that self-regulation has both an indirect and a direct role in the relationship between school burnout and self-esteem.
Bünyamin Ateş (2016)	Article	Solution focused psychological counseling, school, school burnout, high school students	According to the findings obtained from the research, solution-oriented group counseling was effective in the school burnout of high school students.
Ayşe Aypay, Emine Durmuş, Eren Can Aybek (2016)	Article	Peer bullying, school burnout, parental monitoring, victim	As a result of the research, it was found that the scores of being a victim of verbal and relational bullying as the level of burnout caused by family increases, of being a victim of verbal bullying as the level of school burnout caused by school activities increases, while the scores of being a victim of physical bullying decrease as the level of burnout caused by loss of interest in school increases.
Gufran Gündoğmuş (2017)	Master Thesis	Loneliness, attitude, parental attitude, burnout, school burnout, adolescence	As a result of the research, it was observed that loneliness was significantly predicted by burnout caused by family, loss of interest in school, inadequacy at school, and democratic parental attitude.
Hakan Sarıçam, İsmail Çelik, Halis Sakız (2017)	Article	Metacognition, education stress, school burnout, adolescents	As a result of the research, it was determined that metacognitive awareness had a mediator role in the relationship between educational stress and school burnout, and school burnout was strongly predicted by educational stress.
Birsen Şahan, Baki Duy (2017)	Article	School burnout, self-efficacy, school attachment, friend support, secondary school	As a result of the research, it was found that school burnout was predicted significantly by the teacher attachment variable.
Meva Demir, Adem Peker (2017)	Article	Motivation, burnout, structural equation model	The main finding of the study is that school burnout is significantly predicted by motivational determination.
Meva Demir, Başaran Gençdoğan (2017)	Article	Burnout, exam anxiety, academic success	The main finding reached as a result of the research is that academic achievement and test anxiety have a predictive role in school burnout.
Gürcan Şeker, Yasemin Yavuzer (2017)	Article	School burnout, academic locus of control, adolescents	As a result of the research, there was a positive and moderate relationship between school burnout and external locus of control; it was found that there is a negative and moderate relationship with the internal locus of control.
Emine Durmuş, Ayşe Aypay, Eren Can Aybek (2017)	Article	Parental monitoring, positive school climate, school burnout, high school, model testing	As a result of the research, it was determined that there is a negative relationship between parental monitoring and school climate, and school burnout.
Ayşe Aypay (2017)	Article	School burnout, reward addiction, academic context, high school, student, social	As a result of the research, it was found that reward commitment predicted school burnout.
Aygen Çakmak, Hande Şahin (2017)	Article	Secondary school students, school burnout, social relationship elements	As a result of the research, it was found that the school burnout levels of the students differed significantly according to the age of the parents, socioeconomic status, education level of the parents, class, and gender.
Pervin Nedim Bal, Casim Kaya (2017)	Article	School burnout, solution focused group counseling, 6th grade students	As a result of the research, it has been found that solution-oriented group psychological counseling is effective in the intervention of school burnout.
Yusuf Çelik, Ahmet Üstün (2017)	Article	Burnout, burnout, depersonalization, competence, senior university students	As a result of the research, it was found that the school burnout scores did not differ significantly in terms of the regions where the students came from and the gender variable, and the school burnout scores differed significantly in terms of the department they studied. In addition, it was determined that the family socioeconomic level variable showed a significant difference only in the dimension of depersonalization.

(Continued)

TABLE 4 | Continued

Author and publication year	Publication type	Keywords	Result
Nuray Taştan, Rıza Gökler (2017)	Article	Cyberbullying, school burnout, student	As a result of the research, it was found that there is a moderate and positive relationship between school burnout and cyberbullying.
Aylin Arıcı, Taner Artan, Merve Çiçek, Yalçın Özbek, Doğan Niyazi Özüçelik (2017)	Article	School social work, creative drama, life satisfaction, school burnout	As a result of the research, it was found that creative drama activities were effective in reducing school burnout.
Dilara Saka, Sabahat Burak (2018)	Article	Music education, music lesson downloads, school burnout	As a result of the research, it was found that there is a negative relationship between students' school burnout and music lesson loading levels.
Ayşe Aypay (2018)	Article	Sensitivity to punishment, school burnout, sense of school, sense of belonging to school	As a result of the research, it was found that there is a positive relationship between the students' punishment sensitivity sub-dimensions and school burnout levels.
Zeynep Banu Gündüz, Arzu Özyürek (2018)	Article	School burnout, parental attitude, high school students	As a result of the research, it was found that students who perceive parental attitudes as protective and authoritative have higher levels of school burnout, while students who perceive it as democratic have lower levels of school burnout.
Şule Polat, Murat Özdemir (2018)	Article	Educational stress school burnout school alienation secondary school students	As a result of the research, significant relationships were found between school burnout, school alienation, and educational stress, and it was found that school burnout and educational stress predicted school alienation significantly.
Gülcihan Arkan, Yaprak Sargöl Ordin, Meryem Öztürk (2018)	Article	Professional values, ethics, burnout, nursing students	As a result of the research, it was found that as the burnout levels of the nursing department students increased, their professional values decreased.
Mehmet Boyacı, Mehmet Buğra Özhan (2018)	Article	School burnout, hope, family relations, structural equality model school guidance	As a result of the study, it was found that there was a negative relationship between hope and supportive family relationships and school burnout, while a positive relationship was found between disruptive family relationships and school burnout.

TABLE 5 | The contents of the psychoeducation program.

Session	Content
1. Session	<i>Meeting (Structuring) Session</i>
2. Session	<i>Expressing their academic life and analyzing these experiences in terms of school burnout components</i>
3. Session	<i>Students' reactions to the situations in the second session and an analysis of these responses in terms of functionality</i>
4. Session	<i>Handling the phenomenon of school burnout with a cognitive model</i>
5. Session	<i>Focusing on the perception of low personal achievement perceptions, addressing the processes of doubting about their ability and potential and developing self-incriminating attitudes.</i>
6. Session	<i>Focusing on forgetfulness, fatigue, failure to fulfill school-related duties and responsibilities, escape from duties and responsibilities, and emotional exhaustion</i>
7. Session	<i>Focus on the concepts of indifference to courses, academic procrastination, lack of motivation and loss of motivation, and the dimension of depersonalization.</i>
8. Session	<i>Focus on motivation, academic motivation, social support concepts and factors with protective roles</i>
9. Session	<i>Expressing the acquisitions gained during the group process, planning what can be done to protect and increase the acquisitions gained during the sessions after the group</i>

It has been observed that the findings from the session evaluation protocols obtained from the experimental application explain the result of the experimental process. The evaluations of the students participating in the school burnout psychoeducation application related to the reactions they show against the school burnout were categorized under two themes as functional reactions and dysfunctional reactions. An example of the code of emotional exhaustion in the dysfunctional reactions category is by K11 “*I get bored, overwhelmed, worried, tired and sluggish. I cannot attend the lesson because of tiredness, I am constantly sleepy. As such, my homework piles up and I worry. Then, I regret.*” In addition, direct quotations about their functional responses to the emotional exhaustion dimension can be exemplified as by K12 “*I learned about distortions, for*

example, I can notice the distortions I make during the day. I learned how to deal with these. I learned that when my reactions are not functional, they will continue. I started to be more sensitive and calmer to things.”

Sample expressions taken from the interviews made after the implemented program are as by K7 “*I was also telling my parents, for example, I was asking “Mom, I get bored in lessons, what’s the reason for this” and etc. They never took me seriously, but I told you, I poured my heart out and relaxed. It contributed in this way. I also learned motivation, my teacher, I learned intermediate beliefs, basic beliefs, my teacher, I learned distortions. In this way, my indifference and boredom towards the lessons decreased*” and by K12 “*For example, I am calmer towards my teachers and friends, and I do not give adverse answers. I also*

do my homework without delay, even if I am tired, I will not delay. So, I see the effect,” and explain the significant difference found in the emotional exhaustion dimension.

The analysis for the depersonalization dimension, another dimension of school burnout, is given in **Table 7**.

When **Table 7** is examined, it can be said that cognitive-behavioral therapy-based school burnout psychoeducation program applied to secondary school students provided a significant decrease on the depersonalization levels of the students in the experimental group [$F_{(1,29)}=15.286$, $p=0.001$, $\eta^2=0.361$]. Bonferroni test results showed that the results obtained in the post-test scores were in favor of the experimental group.

Qualitative findings obtained from the session evaluation protocols explain this. The evaluations of students participating in the school burnout psychoeducation program regarding their reactions to school burnout, a dysfunctional sample directly quoted from the depersonalization code by K3 as “The teachers do not call me by my name and they use bad words, I am just annoyed by this situation, just annoyed,” functional responses for desensitization code by K6 “It is challenging for me that my friends know all the answers, my teachers always set someone example, I am guilty about issues that are not related to me. When I undergo through these situations, I ask why they do it, I say I do not want them to do it,” K3 “I mean, I did not want to come to school anymore for a moment, I even thought if I should quit. But I realized I had goals. I realized that to achieve these goals, I had to be in school. When I started these sessions with you, I realized that it is more necessary for me to reach these goals. Well, while I was studying, I used to think “I should not study, why am I studying? What is the point? but now I realized that I have to study.”

Sample expressions taken from the interviews made after the program are by K1 “For example, my teacher, I understood that I should not upset myself with what others said. Also, my teacher, for example, I learned some distortions, what caused them when I made things too big or too small,” “I can say that this application helped me to know myself. I learned about cognitive distortions. For example, I use it when deciding how to behave when something happens between me and someone,” and it explains the significant difference found in the depersonalization dimension.

The analysis for the low personal accomplishment dimension, another dimension of school burnout, is given in **Table 8**.

When **Table 8** is examined, it can be said that cognitive-behavioral therapy-based school burnout psychoeducation program applied to secondary school students provided a significant decrease on the low personal achievement perceptions of the students in the experimental group [$F_{(1,29)}=7.995$, $p=0.009$, $\eta^2=0.228$]. Bonferroni test results showed that the results obtained in the post-test scores were in favor of the experimental group.

In the session evaluation protocols, the direct quotation regarding the perception of low personal accomplishment dysfunctional reactions code is K1 “The question of whether I can do it causes me anxiety or I’m afraid if I get lower marks. This time, my self-confidence decreases, and I do not want to talk, I do not want to listen.” For low personal accomplishment code, functional responses can be exemplified as K6 “I constantly fear whether I will fall out of favor with the teachers. I become much more ambitious in case someone does it better than me. Telling myself that I have to compete with myself and have confidence,” K8 “I get anxious when I get a low grade in a course. I found out that I was making an

TABLE 6 | Analysis results regarding emotional exhaustion.

Source	Sum of squares	df	Mean square	F	Sig.	η^2
Corrected model	73.211	2	36.606	22.468	0.000	0.625
Intercept	1.072	1	1.072	0.658	0.424	0.024
Emotional exhaustion pre-test	8.678	1	8.678	5.327	0.029	0.165
Group	69.212	1	69.212	42.482	0.000	0.611
Error	43.989	27	1.629			
Total	2882.00	30				
Corrected total	117.20	29				

The results of the analysis regarding the effectiveness of the experimental procedure with bold lines are highlighted.

TABLE 7 | Analysis results regarding depersonalization.

Source	Sum of squares	df	Mean square	F	Sig.	η^2
Corrected model	61.527	2	30.764	57.392	0.000	0.810
Intercept	6.081	1	6.081	11.345	0.002	0.296
Depersonalization pre-test	8.194	1	8.194	15.286	0.001	0.361
Group	50.658	1	50.658	94.506	0.000	0.778
Error	14.473	27	0.536			
Total	2506.00	30				
Corrected total	76.00	29				

The results of the analysis regarding the effectiveness of the experimental procedure with bold lines are highlighted.

TABLE 8 | Analysis results regarding perception of low personal achievement perceptions.

Source	Sum of squares	df	Mean square	F	Sig.	η^2
Corrected model	53.350	2	26.675	80.474	0.000	0.856
Intercept	10.008	1	10.008	30.194	0.000	0.528
Perception of low personal achievement perceptions pre-test	2.650	1	2.650	7.995	0.009	0.228
Group	51.904	1	51.904	156.585	0.000	0.853
Error	8.950	27	0.331			
Total	905.000	30				
Corrected total	62.300	29				

The results of the analysis regarding the effectiveness of the experimental procedure with bold lines are highlighted.

exaggeration. I realized that I was not failing, I was hardworking. I developed the alternative idea of “you are already successful, you got low in a lesson” and I was happy with this idea.” K7 “I wish I could be successful in all subjects; I tell myself that I should do, I should study, and I realized that these were necessity statements or all-or-nothing thoughts,” K11 “I have a lot of anxiety about the lessons, I have no self-confidence. I experience sadness and pessimism by making things disasters to me,” K1 “My teacher, after trying to do more in the exams and if I get higher marks, I tell myself that OK, K1, you did this, you can do it in the future. It has been useful for me.”

Sample expressions taken from the interviews made after the program implemented are K7 “I believe more now that I can do things,” K8 “I realized that I would never break my mood and move on, consistently adhere to a plan and concentrate, and if I have something in my mind, I will achieve that. So, with these sessions, my belief that I can do something for myself increased,” K6 “My goal was to get higher marks from the exams. I think I achieved this. I used to have 22 wrong answers, but now I’ve pulled it into the range I wanted. And as such, my belief in going to a science high school increased. So I can say that this program has an impact on my study,” and this explains the significant difference found in the low personal accomplishment dimension.

DISCUSSION

In this research, a psychoeducational program for children with high symptoms of school burnout was developed and its effectiveness was examined. In the process of both developing the intervention program and examining its effectiveness, data triangulation was done in line with the mixed methods research approach. In this sense, the process started with a qualitatively oriented approach. In this context, the structure of school burnout was determined based on document analysis and phenomenology patterns and the intervention program was shaped. In the second phase of this process, quantitative and qualitative data collection processes were carried out in order to test the effectiveness of the developed intervention program. In the last stage, all the findings obtained were mixed and interpreted in order to provide high validity and reliability.

In this context, the experimental process carried out regarding the effectiveness of the school burnout intervention program

developed based on CBT is the quantitative dimension of the research. The findings obtained from this quantitative dimension reveal that the intervention program is an effective approach in reducing the symptoms of *emotional exhaustion*, *depersonalization* and *low personal accomplishment* (Salmela-Aro et al., 2009a,b), which are three main dimensions of school burnout. This finding is consistent with the limited number of research results that include interventions for school burnout in the literature (Salanova et al., 2010; Anggreini et al., 2019; Susanti et al., 2019). However, with the thought that quantitative approaches focusing on statistical validity as a requirement of positivist approaches will constitute an important limitation. It was aimed to strengthen the validity by explaining and expanding the findings obtained by trying to learn how the students’ experiences in the process shaped and to include these in the analysis (Mertens, 2019; Creamer, 2020). In this respect, it was determined that the analyzes carried out in two different qualitative processes, during and after the experimental application, generally explained the quantitative results and supported the findings regarding the effectiveness of the intervention program implemented.

Quantitative findings indicate that symptoms related to burnout significantly decrease after the intervention and the document analyzes obtained during the experimental application show that the cognitive distortion processes, which constitute the main focus of CBT, are understood by the students sufficiently and that the cognitive model is used effectively (K11, K1, K7) in the development of effective coping approaches. Similarly, the findings obtained from phenomenological interviews (K7, K12) can be evaluated as evidence that the cognitive model is used effectively both in the academic process and in daily life (K3). In the findings obtained from the interview processes after the application, it was determined that the students’ awareness of cognitive distortions that prepared the ground for school burnout increased (K7, K11), and the participants used expressions (K1, K3, K6, K7, K12) showing that the practice they participated in was effective in developing healthy cognitions and responses. In addition, it was found that there were some efforts to apply the cognitive model taught during the application in their daily lives (K6, K12) and it was concluded that these findings support and confirm the quantitative results.

In addition to the fact that quantitative findings show that there is a significant difference between pre-test and post-test measures, it is also possible to see the change in children more subjectively

through qualitative findings (Mason, 2006). In this sense, it is understood that with the obtained qualitative findings, students frequently use overgeneralization, personalization and selective abstraction distortions and learned to distinguish their reactions as functional and dysfunctional reactions. Increasing children's awareness of cognitive distortions and functional coping approaches is an important achievement of intervention practice and is expected to positively affect not only the school life but also the daily life.

In this context, as a result of the study conducted by Farina et al. (2020), it was found that the level of satisfaction with peer and adult relationships at school mediator the relationship between empathy skills (affective and cognitive) and school burnout as a risk factor. It has been evaluated that the intense use of the affective dimension of empathy is a risk factor for emotional exhaustion. The qualitative findings of the study were also found to be compatible with the intense emphatic concerns of the students, as well as feeling unable to cope with school-related responsibilities or feeling overwhelmed by the weight of these tasks (Wagaman et al., 2015; Bloom, 2017). In addition, studies have shown that students become overwhelmed with school and their work due to the decrease in their evaluations of the school and their feelings of emotional attachment to the school, as a result of seeing the school as less valuable, and as a result, they experience school burnout. It has been found to be effective (Wang et al., 2015). In the PISA 2012 (Organisation for Economic Co-operation and Development, 2013) results, it was reported that Korean students with the highest academic performance level were also the most unhappy students with the effect of decreased motivation and school engagement in the transition to high school education. In this context, the finding obtained from the study that there are exams in the transition to the next education level and that both parents and teachers have expectations above their abilities and skills is important in terms of experiencing burnout, parallels the report.

In addition, students' perfectionist tendencies and inadequacy of coping skills were found to be closely related to school burnout (Lau et al., 2020). A meta-analysis study by Kim et al. (2017) revealed that social support, which is closely related to the depersonalization dimension of school burnout, is effective in reducing school burnout. In this study, it was found that the perceived social support from parents, teachers, and peers helped students to stay away from the school context and develop a sense of belonging.

Social support has a mediator role between school burnout and academic self-efficacy (Aslan, 2018), and in the study conducted by Ulaş and Seçer (2018), academic self-efficacy has a mediator role in the relationship between school burnout and psychological maladjustment. Within the scope of this study, with the analysis of the goals that the students set for themselves in the content of the psychoeducation program, it was seen that the majority of the students had goals to improve their interpersonal relations and communication skills. This situation was evaluated as an effort to get rid of the effects of the depersonalization dimension, which is characterized by the elimination of social exclusion or isolation.

Among the prevention and intervention studies on school burnout, (Salanova et al., 2010) applied a 4-month

cognitive-behavioral approach based on social cognitive theory and aimed at reducing the burnout of university students and increasing their self-efficacy and performance. The main purpose of this program was expressed as minimizing students' pre-exam anxiety levels and increasing their efficacy beliefs, and school burnout was handled indirectly, and the findings revealed that the practice was significantly effective on students' school burnout. In the study conducted by Çapri and Yedigöz-Sönmez (2013), the effect of the stress-coping program on the burnout levels of high school students was examined and it was concluded that this program was significantly effective on the burnout of high school students. However, this study has additional academic factors such as lack of motivation, academic motivation, commitment to school, as well as the intensity of exams and test anxiety, the stress in general and academic stress in particular, at the point of experiencing school burnout obtained through interviews and document analysis before creating the psychoeducation program content. It has been found that psychosocial factors such as depression, anxiety, self-regulation, avoidance of responsibility, perceived parental attitudes, comparison within peer groups or lack of social support have an important place.

In this context, it has been evaluated that the studies conducted by Salanova et al. (2010) and Çapri and Yedigöz-Sönmez (2013) only focus on dealing with test anxiety and stress, creating a limitation in ensuring construct validity. İlbaş (2014), in his study with university students, concluded that solution-based group counseling was significantly effective on school burnout experienced by students. In this study, as a result of the qualitative dimension carried out to create the psychoeducational content, it was seen that the role of the family in the burnout of students is undeniable. Salmela-Aro et al. (2009b), on the other hand, found that the burnout levels of parents would also reflect on adolescents. In this context, while the codes related to the family were found to be parental attitudes, unrealistic expectations of parents from their children and seeking perfection, and comparing children with their peers, it was seen that this situation led students to doubt their own abilities and potentials. In addition, it has been found that the cooperation of the school and the family is a factor that strengthens the position of children in terms of school burnout. Salmela-Aro et al. (2009b), it was seen that it was mostly fed by school-related factors (trust in the teacher, positive attitudes and approaches of the teacher, enriching the learning environment through various materials) compared to the qualitative findings obtained from this study. A group intervention based on Rational Emotive Behavior Therapy by Anggreini et al. (2019) focused on the academic dimensions of school burnout and it was found to be effective. It was found that the Hope Therapy application by Mahdavi et al. (2020) significantly reduced students' burnout levels. Acceptance and Commitment Therapy Counseling and Mindfulness-based Cognitive Counseling are effective in reducing school burnout (Susanti et al., 2019; Ahmadi-Moghadam et al., 2020) find that it is effective in reducing school burnout, which is considered as a dimension of academic well-being. Found. It was found that the main theoretical views on which these practices are based are an

extension of CBT, therefore, the problem in the intervention of school burnout stems from possible cognitive errors, and this situation can only be resolved by replacing these dysfunctional cognitions with functional cognitions.

Study Limitations and Further Research

Although the research was conducted with an experimental design, which is strong in terms of cause-effect relationship, it has some limitations in terms of evaluation of the study group and the participants. The participants of the research were selected from the non-clinical group. Therefore, it is beneficial to conduct clinical trials as the results obtained cannot be generalized to clinical samples. In addition, in the context of multilevel approaches, it is thought that there is a need for practices that make parents and teachers a part of the intervention and data triangulation. The fact that the study was tested in a small group and only the school burnout scale was used as a measurement tool are limitations of the study. Finally, it is thought that the effectiveness of the program should be examined in other school levels other than the secondary school age group.

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DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Atatürk University Educational Sciences Ethics Committee. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

SU and İS worked together in the planning, practice, and reporting of this study. This study is based on a master's thesis by SU and supervised by İS. Both authors contributed to the article and approved the submitted version.

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The relationship between parental phubbing and learning burnout of elementary and secondary school students: The mediating roles of parent-child attachment and ego depletion

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In this study, we examined the effects of parental phubbing on learning burnout in elementary and secondary school students and its mechanism of action. A questionnaire method was applied to investigate parental phubbing, parent-child attachment, ego depletion, and learning burnout among 2090 elementary and secondary school students in Anhui Province, China. The results are as follows: (1) Parental phubbing was significantly correlated with parent-child attachment, ego depletion, and learning burnout; (2) Parental phubbing has an indirect impact on learning burnout in elementary and secondary school students through three pathways: a separate mediating effect on parent-child attachment, a separate mediating effect on ego depletion, and a chain mediating effect on both. Parental phubbing is a risk factor for Learning Burnout, which can positively affect Learning Burnout in elementary and secondary school students. The findings of the study contribute to revealing the influence mechanism of parental phubbing on learning burnout in elementary and secondary school students.

KEYWORDS

learning burnout, ego depletion, parent-child attachment, elementary and secondary school students, parental phubbing

Introduction

Learning burnout is a learning-related persistent negative psychological state found in normal individuals (Wu et al., 2007; Steele and Fullagar, 2009), which is manifested in three aspects, including physical and mental exhaustion, academic detachment, and low achievement (Schaufeli et al., 2002; Wu et al., 2010). Research has shown that learning burnout can lead to a series of adverse consequences, including physical dysfunctions such as headache, loss of appetite, joint pain, and general weakness, behavioral problems such as truancy and dropping out of school, and psychological problems such as anxiety and depression (Bask and Salmela-Aro, 2013; Wang et al., 2015). Studies have identified learning

burnout in many students and even a trend of spreading to younger students (Wu et al., 2007; Yang et al., 2013; Zhang et al., 2013; Zhu et al., 2021). Previous research results indicate that home environment and parenting style are important factors of learning burnout in elementary and secondary school students (Chang et al., 2015; Luo et al., 2016a,b). Among family factors, the effect of parental phubbing on learning burnout is rarely mentioned. Phubbing, a compound word for phone and snubbing, refers to the behavior of individuals with their heads down and absorbed in their phones in social situations while not minding or even snubbing the people or things around them (Angelucci, 2016; Roberts and David, 2016). Parental phubbing happens when cell phone use occurs in parent–child interactions, where parents focus excessively on their phones and neglect their children instead of caring for or interacting with them (Ding et al., 2018; Xie et al., 2019; Jiang et al., 2021). Previous research has shown that parenting styles with more parental warmth are less likely to induce learning burnout, whereas individuals under parenting styles with more rejections and denials are more vulnerable to learning burnout (Aunola et al., 2000; Li and Gan, 2011; Luo et al., 2016a,b). According to the 2014 National Parent–Child Relationship Report, 17.8% of parents often use their phones, and 51.8% occasionally use their phones when spending time with their children. As a risky environmental factor, parental phubbing may have negative effects on adolescents' emotions, cognition, learning, and questionable behaviors, thus impairing their learning effectiveness, psychological health, and adaptability development (Reed et al., 2017; Ding et al., 2020). Parental phubbing is a new common parenting behavior. Although previous research has found the negative effects of parental phubbing on learning, its effects on learning burnout have not been explored in depth. Therefore, this study examines the effects of parental phubbing on learning burnout in elementary and secondary school students and its mechanisms of action, which are important for the prevention and intervention of learning burnout in elementary and secondary school students.

Parental phubbing and learning burnout

Parental phubbing is a new type of neglect and rejection behavior between parents and children (Roberts and David, 2016; David and Roberts, 2017; Allred, 2020). Previous studies found that students whose parents exhibited more neglect and rejection behavior were more prone to learning burnout (Li and Gan, 2011; Shin et al., 2012; Luo et al., 2016a,b; Zhu et al., 2021). And parental phubbing may cause lower satisfaction of children's basic psychological needs. Self-determination theory (SDT) defines that the basic human psychological needs include autonomy needs, competence needs, and relatedness needs (Deci and Ryan, 1985, 2000). Social situations that satisfy the three psychological needs promote the internalization of external motivation and motivate individuals to persist longer in an activity, thus enabling them to maintain a positive psychological state, grow better, and produce

more positive behavioral outcomes. In contrast, environments that impede the satisfaction of these three needs often reduce individuals' autonomous motivation, work performance, and well-being (Reis et al., 2000; Patrick et al., 2007). The satisfaction of psychological needs is necessary for the optimal development of the individual. Impairing or depriving the satisfaction of any one of the three needs can have significant adverse consequences. Empirical studies have also found that the satisfaction degree of students' basic psychological needs could effectively predict learning-related behavior outcomes such as learning burnout and academic performance (Jang et al., 2009, 2012), and higher satisfaction degree of the three basic psychological needs means a lower level of learning burnout (Reeve, 2009; Sun and Zhang, 2012; Luo et al., 2014). Therefore, we hypothesized that the level of learning burnout in elementary and secondary school students might increase when perceiving the neglect and rejection from parental phubbing. Based on the above theoretical analysis and empirical results, we propose research hypothesis H1: Parental phubbing is a positive predictor of learning burnout among elementary and secondary school students.

The mediating role of parent–child attachment

Other than the direct effects of parental phubbing, this study also examines the mediating role of parent–child attachment based on attachment theory. As discussed above, parental phubbing is considered a form of neglect and rejection that can undermine parent–child attachment and affect children's psychological health development (Xie and Xie, 2020; Wang et al., 2021). Phubbing can cause a sense of social exclusion (David and Roberts, 2017). Adolescents are no exception. They would feel neglected when experiencing parental phubbing. As the earliest form of interpersonal relationship and essentially a relational structure, parent–child attachment is an emotionally enduring bond between parents and children (Ainsworth and Bowlby, 1991). Parental neglect is one of the risk factors affecting parent–child attachment, and children experiencing parental neglect are often reported to have high levels of insecure attachment (Borelli et al., 2015). Therefore, parental phubbing disrupts and reduces the level of parent–child attachment. On the other hand, parent–child attachment has a great impact on the development and adaptation of individuals (Popov and Ilesanmi, 2015). Attachment theory suggests that individuals with secure parent–child attachments are able to fully engage in exploratory activities even facing difficulties due to the protective, supportive, accessible, and empowering roles of the attachment object (usually parents), which ensure that the individuals feel safe and stress-free while engaging in exploratory activities, thereby increasing the willingness and quality of exploration (Bowlby, 1969; Aspelmeier and Kerns, 2003). Empirical studies have also found that the parent–child attachment among family factors is an important factor of learning burnout, i.e., parent–child

attachment negatively predicts learning burnout (Zhang, et al., 2019). Improving parent–child communication can reduce learning burnout among secondary school students to some extent (Zhu and Wang, 2009). Factors such as family environment and parenting style affect learning burnout through the mediating effect of parent–child attachment (Wu, 2015). Through the above analysis, this study proposes research hypothesis H2: Parental phubbing affects learning burnout through the mediating effect of parent–child attachment.

The mediating role of ego depletion

Ego depletion is a significant predictor of learning burnout (Baumeister et al., 1998; Price and Yates, 2010; Seibert et al., 2016). Ego depletion is a temporary decrease in an individual's ability or willingness to perform volitional activities (Inzlicht and Schmeichel, 2012). The resource model of self-control suggests that controlling attention, emotion regulation, and cognitive processing are all self-control activities that consume the limited self-control resources, which impairs the ability to engage in subsequent self-control tasks, resulting in ego depletion (Inzlicht and Schmeichel, 2012).

Parental phubbing may lead to ego depletion in elementary and secondary school students, which can be explained in cognitive terms. On the one hand, according to expectancy violations theory, individuals always have expectations about the behaviors of each other. During social interactions with others, if the behaviors of others are inconsistent with the individual's expectations, this expectancy violation can cause arousal and force the individual to make a series of cognitive assessments of the violation (Gong et al., 2019). Phubbing can produce negative expectancy violations (Nakamura, 2015; Gong et al., 2019). Therefore, after sensing the cold shoulder from parental phubbing, which contradicts their expectations of their parents, children would make cognitive assessments of such parental phubbing. For example, they would inquire about the reasons for the frequent parental phubbing. This inconsistency between particular parental behavior and children's psychological expectations can further increase the cognitive burden and deplete the psychological resources of the children. On the other hand, parental phubbing can induce feelings of rejection in children, triggering a strong claim for attention and belonging (David and Roberts, 2017) and greater sensitivity and attention to parental behavior. Empirical research has found that cognitive processing and attention control greatly deplete self-control resources, thus leading to ego depletion (Inzlicht and Schmeichel, 2012). Based on the above theoretical and empirical evidence, we hypothesize that parental phubbing causes ego depletion. Secondly, ego depletion may lead to learning burnout. In essence, learning burnout is a negative way to cope with learning tasks beyond an individual's competence (Vasalampi et al., 2009; Tuominen-Soini and Salmela-Aro, 2014; Salmela-Aro et al., 2019), encompassing three dimensions of physical and mental exhaustion, academic detachment, and low achievement.

First, ego depletion is sometimes considered a process whereby mental energy is expended during ego activity and takes time to recover afterward, similar to the need for rest to recover from muscle fatigue (Baumeister et al., 1998, 2000; Baumeister, 2000, 2001). In China, elementary and secondary school students learn at a fast pace and under a tight curriculum. With the fatigue from ego depletion, the new learning tasks may lead to physical and mental exhaustion in the learning process. Secondly, individuals have a lower level of attention control when in the ego depletion state (Garrison et al., 2018). Thus, they are easily distracted by other things (Englert et al., 2015), which is not conducive to the completion of learning tasks. In addition, construal level theory suggests that individuals in a state of ego depletion focus more on the achievability of events or tasks, especially the difficulty and completion method. Thus, they are more likely to choose tasks that are easier to achieve but less valuable (Fujita, 2008). For students, the achievable tasks in a state of ego depletion may include recreational activities other than academics or other tasks that appear easier than the academic work due, all of which can contribute to academic detachment. Finally, ego depletion may be followed by cognitive biases manifesting as an underestimation of one's own capabilities, a negative assessment of one's own control over the external environment, and more pessimistic expectations for the future (Fischer et al., 2007). This can decrease an individual's learning self-efficacy and cause a low sense of accomplishment. Empirical studies have also found that self-efficacy is an effective predictor of learning burnout (Zhu and Wang, 2009). With the above analysis, we propose research hypothesis H3 based on the ego depletion theory: Parental phubbing significantly and positively predicts the level of learning burnout in elementary and secondary school students through the mediating effect of ego depletion.

The chain mediating roles of parent–child attachment and ego depletion

In addition to examining the isolated mediating roles of parent–child attachment and ego depletion, we also examined their chain mediating roles based on parental acceptance–rejection theory. Parental acceptance–rejection theory suggests that parenting includes the dimensions of acceptance and rejection, where the acceptance and inclusion from parents promote the healthy development of children while parental neglect and rejection negatively affect the cognitive, behavioral, and emotional development of adolescents (Rohner, 2004; Fard et al., 2015). Parental neglect and rejection can also have a range of negative effects on children and adolescents, e.g., low parent–child attachment, ego depletion, and learning burnout (Shin et al., 2012). Nevertheless, the relationship between the outcomes induced by parental refusal behaviors is not clear. This study attempts an extension of the parental acceptance–rejection theory to examine whether parental rejection behaviors (parental phubbing) in the Internet era affect the levels of learning burnout

in elementary and secondary school students through the chain mediating effects of parent–child attachment and ego depletion. According to the attachment theory, the mental representations and cognitive patterns of self and others affect an individual's processing of knowledge experience and emotional affect in the self and social systems (Bowlby, 1969). Secure attachment provides an individual with an “internal working model” to confidently explore the external world. This “internal working model” helps individuals develop a healthy schema to positively understand the intentions of others. Individuals with low parent–child attachment tend to have higher levels of negative emotions such as depression and anxiety (Peter, 2000; Ju and Lee, 2017; Lin et al., 2018). According to the ego depletion theory, the self-regulation of negative emotions consumes many self-control resources and weakens self-control (Baumeister et al., 2007), and negative emotions also lead to higher levels of ego depletion (Inzlicht and Schmeichel, 2012). Ego depletion is the decrease in cognitive levels and executive function due to the consumption of psychological energy (Schmeichel et al., 2003; Tan et al., 2012), which negatively impacts academic success (Price and Yates, 2010). Through the above analysis, we propose research hypothesis H4: parental phubbing affects learning burnout in elementary and secondary school students through the chain mediating effects of parent–child attachment and ego depletion.

Hypotheses of this study

In this study, a serial mediation model (Figure 1) was proposed to test the mediating role of parent–child attachment and ego depletion in the association between parental phubbing and learning burnout in elementary and secondary school students. Based on reviews of the relevant

studies, we had the following tentative hypotheses.

Hypothesis 1: Parental phubbing is positively associated with learning burnout in elementary and secondary school students.

Hypothesis 2: Parent–child attachment plays a mediating role between parental phubbing and learning burnout in elementary and secondary school students.

Hypothesis 3: Ego depletion plays a mediating role between parental phubbing and learning burnout in elementary and secondary school students.

Hypothesis 4: Parent–child attachment and ego depletion play a chain mediating role between parental phubbing and learning burnout in elementary and secondary school students.

Materials and methods

Participants and procedure

Through random cluster sampling, 2,090 students in grades 4 to 9 were selected from two elementary schools and two secondary schools in Anhui Province, China. After excluding the invalid questionnaires with missing answers or consistent responses, 1,967 valid questionnaires were recovered, with an effective rate of 94%. Among them, 1,001 of the valid respondents were boys, and 966 were girls; the valid respondents included 273 in the fourth grade, 243 in the fifth grade, 252 in the sixth grade, 340 in the seventh grade, 427 in the eighth grade, and 432 in the ninth grade. The minimum age of the respondents was 9 years, and the maximum age was 17 years, with a mean age of 12.26 years and a standard deviation of 1.74 years.

Instruments

Parental phubbing scale

A revised Parental Phubbing Scale (Ding et al., 2020) was adopted, which was single-dimensional with nine items, such as “My parents do not use their phone when we are talking.” The

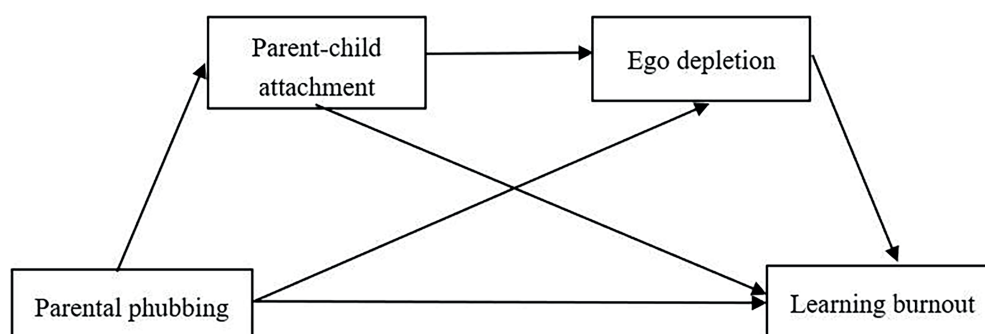


FIGURE 1
The proposed mediation model.

items were rated on a 5-point Likert scale from “Never” to “Always.” The higher the total score, the more intensive the parents focus on their cell phones while neglecting or snubbing their children. In the present study, the coefficient α of this scale is 0.73.

Ego depletion scale

A simplified Ego Depletion Scale was applied (Lanaj et al., 2014), which had five items, such as “I feel exhausted.” The 7-point Likert scale ranging from “Strongly disagree” to “Strongly agree” was adopted, where higher scores indicate higher degrees of ego depletion. The scale is suitable for the Chinese version with good reliability and validity (Ding et al., 2020). In this study, the internal consistency coefficient α of the scale is 0.80.

Parent–child attachment scale

A revised version of the Inventory of Parent and Peer Attachment (IPPA-R) was used to measure the respondents’ attachment to their parents (Chen et al., 2015). The questionnaire had 13 items, such as “My parents respect my feelings.” A 5-point Likert scale ranging from “Never” to “Always” was adopted. Higher scores indicate higher levels of parent–child attachment. In this study, the internal consistency coefficient α of the scale is 0.81.

Adolescent learning burnout scale

The Adolescent Learning Burnout Scale developed by Wu et al. (2010) was adopted, which included dimensions such as physical and mental exhaustion, academic alienation, and low achievement. Its 16 items included “I feel so empty recently, I do not know what to do,” and “I am so bad at studying and really want to give up.” A 5-point Likert scale ranging from “Strongly disagreeable” to “Strongly agreeable” was used, with higher total scores indicating higher levels of learning burnout. In this study, the coefficient α of this scale is 0.80.

Statistical analysis

In this study, trained postgraduates majoring in psychology conducted the test on a class basis, and the questionnaires were distributed and collected on the spot. Descriptive statistics and correlation analysis were carried out on SPSS 18.0. The chain mediation model tests were performed using the SPSS macro

programs PROCESS MODEL 6 compiled by Hayes. Significance testing of regression coefficients was performed using Bootstrap (sampling repeated 5,000 times) to obtain robust standard errors and a 95% bias-corrected confidence interval (CI) for parameter estimation. In addition, age and gender were included as control variables. The Harman single-factor test method was applied to process all measurement items through nonrotating exploratory factor analysis. According to the analytical results, eight common factors with eigenvalues greater than 1 were extracted, the first of which explained 20.15% of the total change, thus falling short of the 40% standard threshold. That is, no deviation is caused by the same data collection method in this study (Podsakoff et al., 2003).

Results

Descriptive statistics and correlation analysis

According to correlation analysis, parental phubbing is significantly and positively correlated with learning burnout; ego depletion is significantly and positively correlated with parental phubbing and learning burnout; and parent–child attachment is significantly and negatively correlated with parental phubbing and learning burnout (Table 1).

Parental phubbing and learning burnout: Chain mediating effect test

A chain mediation model was tested, which consisted of three indirect effects as follows: (1) parental phubbing promotes learning burnout *via* parent–child attachment, (2) parental phubbing promotes learning burnout *via* ego depletion, and (3) parental phubbing promotes learning burnout *via* parent–child attachment and ego depletion (Figure 2).

After controlling the effects of age and gender, the results showed a positive effect of parental phubbing on parent–child attachment, $B = -0.37$, $t = -17.02$, $p < 0.001$, and a positive effect of parental phubbing on ego depletion, $B = 0.12$, $t = 5.05$, $p < 0.001$. A negative relationship between parent–child attachment and ego depletion was also identified, $B = -0.32$, $t = -14.53$, $p < 0.001$.

TABLE 1 Mean, standard deviation, and correlation matrix of each variable.

Variables	M	SD	1	2	3	4	5	6
1. Gender	0.51	0.50	1					
2. Age	12.26	1.73	−0.02	1				
3. Parental phubbing	2.57	0.72	−0.11***	0.17***	1			
4. Parent–child attachment	3.55	0.89	0.04	−0.16***	−0.38***	1		
5. Ego depletion	2.07	0.78	−0.05*	0.15***	0.25***	−0.38***	1	
6. Learning burnout	2.61	0.69	−0.08***	0.19***	0.25***	−0.46***	0.61***	1

* $p < 0.05$; ** $p < 0.001$.

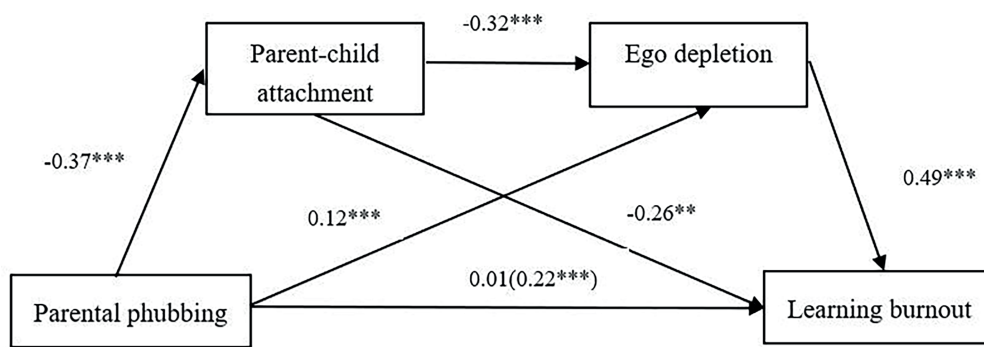


FIGURE 2

Serial mediation model shows effects of Parental phubbing, Parent-child attachment, and Ego depletion on Learning burnout. $N=1,967$. The total effect of Parental phubbing is shown in parentheses. Regression coefficients were obtained after controlling for age and sex in PROCESS Procedure for SPSS. *** $p < 0.001$.

Moreover, parent-child attachment significantly predicted learning burnout, $B = -0.26$, $t = -13.38$, $p < 0.001$. Ego depletion significantly predicted learning burnout, $B = 0.49$, $t = 26.61$, $p < 0.001$. The total effect of parental phubbing on learning burnout was statistically significant, $B = 0.22$, $t = 9.84$, $p < 0.001$. After controlling the effects of parent-child attachment, ego depletion, age, and gender, the direct effect of parental phubbing on learning burnout was not significant, $B = 0.01$, $t = 0.49$, $p = 0.63 > 0.01$.

Furthermore, the indirect effect of parental phubbing on learning burnout through parent-child attachment was significant, $B = 0.095$, $SE = 0.011$, 95% CI [0.073, 0.117]. The mediation effect (parental phubbing → parent-child attachment → learning burnout) accounted for 43.18% of the total effect. Also, ego depletion mediated the relationship between parental phubbing and learning burnout, $B = 0.057$, $SE = 0.013$, 95% CI [0.031, 0.083]. The mediation effect (parental phubbing → ego depletion → learning burnout) accounted for 25.91% of the total effect. Finally, the indirect effect of parental phubbing on learning burnout through parent-child attachment and then ego depletion (i.e., a chain mediating effect) was also found, $B = 0.059$, $SE = 0.008$, 95% CI [0.043, 0.076]. The mediation effect (parental phubbing → parent-child attachment → ego depletion → learning burnout) accounted for 26.82% of the total effect. The direct and indirect effects of parent-child attachment and ego depletion on the relationship between parental phubbing and learning burnout are shown in Table 2. Since 0 is not contained in the Bootstrap 95% confidence intervals, these three indirect effects are statistically significant.

Discussion

Parental phubbing and learning burnout

This study found that parental phubbing is significantly related to learning burnout in elementary and secondary school students, which is consistent with the research on parental phubbing and the internalizing and externalizing problems in children and adolescents. Thus, the negative effects of parental

TABLE 2 Direct, indirect, and total effects of parental phubbing on learning burnout.

Model pathways	Estimated effect (β)	95%CI	
		Lower	upper
DIRECT EFFECT			
PH \rightarrow LB	0.009	-0.029	0.046
INDIRECT EFFECTS			
PH \rightarrow PCA \rightarrow LB	0.095**	0.073	0.117
PH \rightarrow ED \rightarrow LB	0.057**	0.031	0.083
PH \rightarrow PCA \rightarrow ED \rightarrow LB	0.059**	0.043	0.076
Total effect	0.219***		

PH, parental phubbing; PCA, parent-child attachment; ED, ego depletion; LB, learning burnout. ** $p < 0.01$; *** $p < 0.001$.

phubbing on child and adolescent development are consistent, which include internalizing problems such as anxiety and depression and externalizing problems such as reduced learning efficiency, Internet addiction, and aggressive behavior (Sharaievska and Stodolska, 2016; Cho and Lee, 2017; Reed et al., 2017; Stockdale et al., 2018; Xie et al., 2019). Healthy socio-emotional development in children depends on sensitive parent-child interactions (Kelly et al., 2011). Parental phubbing during parent-child interaction makes it difficult for parents to identify and respond to children's individual needs in time, resulting in problem behaviors in children (Jiang et al., 2021). That also proves that individuals who grow up under the rejection parenting style experience more frustrations, feel more pressure and helplessness, and then experience academic burnout (Shin et al., 2012; Luo et al., 2016a,b). However, the present study is the first to discuss the impact of parental phubbing on learning burnout. Learning burnout has significant impacts on learning and life. It can lead to a range of adverse developmental outcomes, such as low levels of academic achievement, truancy, absenteeism, dropping out of school, and even psychological problems and disorders (Bask and Salmela-Aro, 2013; Wang et al., 2015). This is especially true in Chinese society, where learning is highly valued, and academic

performance is considered highly important by parents. However, parental phubbing is becoming increasingly common with the popularity of smartphones, and many parents neglect the impact of phubbing on their children's learning. The results of this study have practical implications in that it suggests that parental phubbing is an important factor inducing learning burnout in elementary and secondary school students.

The mediating role of parent–child attachment

Secondly, this study found that parent–child attachment mediated the relationship between parental phubbing and learning burnout, i.e., parental phubbing affected the learning burnout in elementary and secondary school students by decreasing parent–child attachment levels. This finding is consistent with the findings of previous studies on how parental phubbing adversely affects adolescents through parent–child attachment, e.g., Internet addiction (Cho and Lee, 2017; Xie et al., 2019; Zhang et al., 2021). Thus, the internal mechanisms by which parental phubbing affects questionable behaviors in adolescents are consistent. As an extension of previous research, this study suggests that parental phubbing impacts the learning problems in elementary and secondary school students through parent–child attachment. This suggests that parental phubbing is an important parenting behavior. According to parental acceptance-rejection theory, parental acceptance provides a warm home environment that promotes parent–child attachment and facilitates the children to explore with greater willingness. Parental phubbing is considered a rejection behavior and negative parenting behavior. Positive parent–child relationships enhance adolescents' ability to cope with academic stress and their motivation, initiative, and persistence in learning, thus effectively curbing learning burnout (Luo et al., 2016a,b).

The mediating role of ego depletion

This study also identified the mediating effect of ego depletion between parental phubbing and learning burnout, i.e., parental phubbing increases the risk of learning burnout in elementary and secondary school students by affecting ego depletion. This result is consistent with the Chinese and international research findings that higher levels of ego depletion are associated with higher levels of learning burnout (Price and Yates, 2010; Zhang, 2010), suggesting the important mediating role of ego depletion in the process of parental phubbing affecting the learning burnout in elementary and secondary school students. Parental phubbing is considered a new form of neglect and rejection (Roberts and David, 2016; David and Roberts, 2017; Allred, 2020). According to limited self-control theory, individuals consume part of their limited

cognitive resources after experiencing social exclusion, which reduces their level of self-control and induces ego depletion. As a typical manifestation of poor interpersonal relationships, social exclusion affects ego depletion (Baumeister et al., 2005; Bertrams and Pahl, 2014). Ego depletion is a process by which activities originating from the ego deplete mental energy and cause a decline in executive function (Tan et al., 2012). As a social exclusion behavior, parental phubbing depletes self-control resources and results in ego depletion, which in turn leads to reduced self-regulation, difficulties in emotion control, difficulties in attention control, and stress (Tan et al., 2012). These, in turn, increase the risk of learning burnout in elementary and secondary school students. In addition, previous studies of social exclusion leading to ego depletion have generally adopted the experimental paradigms of social exclusion induction, such as the accidental exclusion paradigm and the banishment paradigm (Williams and Jarvis, 2006; Park and Baumeister, 2015). This study is an expansion of the social exclusion research context by examining social exclusion (parental phubbing) in a real-life context.

The chain mediating roles of parent–child attachment and ego depletion

Overall, this study identified the chain mediating effects of parent–child attachment and ego depletion between parental phubbing and learning burnout, suggesting that elementary and secondary school students perceiving more parental phubbing have elevated levels of ego depletion and ultimately suffer from learning burnout. On the one hand, parent–child attachment was found to be an important mediator in explaining the effect of parental phubbing on children's adaptability, which is consistent with previous findings (Xie et al., 2019; Niu et al., 2020). However, few previous studies have continued to explore the mediating processes by which parent–child attachment affects children's adaptability. This study expands one mediating factor from previous studies into an intermediary chain. The explanatory mechanism of parental phubbing affecting children's academic adaptability was enriched from the perspective of ego depletion theory. Since self-control resources can be restored after ego depletion (Baumeister, 2000), interventions such as positive emotion induction (Tice et al., 2007) become possible, which are useful advances to previous research. In addition, the results support the parental acceptance-rejection theory, suggesting that parenting styles of rejection and neglect can negatively affect children and adolescents (Rohner et al., 2010). Moreover, compared with the rough parenting and parental neglect in previous studies (Shin et al., 2012; Qi et al., 2020), the parental phubbing explored in this study is a more insidious factor. This result also enriches the outreach of parental acceptance-rejection theory and expands its scope.

Practical significance

The results of this study have important implications for the prevention and intervention of learning burnout in secondary school students. For one thing, parents are an important part of the family system, and their parenting style plays an important role in children's cognition, emotion, behavior, attitude, academic performance, and even personality building (Jones et al., 2012). Parental neglect and rejection cause the children to be more prone to negative emotions and learning burnout (Blondal and Adalbjarnardottir, 2014; Waterman and Lefkowitz, 2017). Parents should be reminded as much as possible to be aware of what they say and do in their lives to prevent the creation of a risky ecological environment, e.g., avoiding excessive phubbing during parent-child communication. For another, the chain mediating effect suggests that parental phubbing affects learning burnout in elementary and secondary school students through interpersonal and individual factors. Thus, interventions can also be designed based on family and individual factors. For example, parents should actively maintain parent-child relationships, put down their cell phones to communicate more with their children, and jointly develop cell phone use norms; children should actively participate in group activities at school, learn to timely confide in their classmates or friends, and actively express their inner needs to their parents; In the meantime, positive emotional guidance and other methods should be employed to reduce the ego depletion caused by parental phubbing. This also indicates that taking an integrated perspective on learning burnout in elementary and secondary school students and integrating family and individual factors into the microenvironmental systems of child and adolescent development can help improve the effectiveness of interventions.

Limitations and future orientation

Some aspects of this study still need attention and improvements. Firstly, as a cross-sectional study, this research investigated the effects of parental phubbing on learning burnout in elementary and secondary school students but could not determine the causal relationships and developmental changes. Further in-depth studies could be conducted in the future through longitudinal follow-up. Secondly, this study examined parental phubbing as a whole and did not distinguish between paternal and maternal phubbing, while previous studies have shown the different effects of paternal and maternal behaviors of electronics usage on their children (Mcdaniel and Radesky, 2018). Thirdly, other studies in this field noted a bidirectional effect of parental phubbing (Gong et al., 2019). Specifically, a phubbing individual neglects others, and this attitude, in turn, promotes the individual's dependence on electronics. The special affections of parents for their children are different from other interpersonal relationships, and whether this bidirectional effect still exists is uncertain. If this

bidirectional effect exists, the extent to which such a vicious cycle affects adolescents requires investigation.

Conclusion

In summary, this study found that: (1) Parental phubbing was significantly negatively associated with parent-child attachment and significantly positively associated with ego depletion and learning burnout. Parent-child attachment was significantly and negatively associated with ego depletion and learning burnout. Ego depletion was significantly and positively associated with learning burnout. (2) Parental phubbing affects learning burnout through the isolated mediating effect of parent-child attachment; Parental phubbing affects learning burnout through the isolated mediating effect of ego depletion; and Parental phubbing affects learning burnout through the chain mediating effects of parent-child attachment and ego depletion.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by the Ethics Committee of Anhui Normal University. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

QH and BZ contributed to the conception and design of the study. QH organized the database and wrote the first draft of the manuscript. BZ wrote sections of the manuscript. HW and FH performed the statistical analysis. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The role of empathy between peers in upper secondary students' study engagement and burnout

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Having the ability to understand emotionally how other people feel and see things is an essential fabric for building and sustaining functional interpersonal relationships. Without such an ability, social interaction crumbles, engagement fails, and learning is eroded. Yet, empirical evidence on the relationship between study burnout and study engagement, and empathy between upper secondary school students is limited. We are tackling the challenge by exploring the association between empathy between peers and study engagement and study burnout among upper secondary school students. Two hundred and eighty upper secondary education students took part in our cross-sectional study. Structural equation modeling was used to analyze the association between empathy (i.e., cognitive and affective empathy), and study burnout and study engagement. The results showed that cognitive empathy contributed to affective empathy, which was further related to increased levels of study engagement, and decreased levels of cynicism, and sense of inadequacy. The role of cognitive empathy seemed to be more complicated: while cognitive empathy contributed directly to increased levels of cynicism, and inadequacy and decrease in study engagement, the indirect effects of cognitive empathy (through affective empathy) on cynicism and inadequacy were negative, and positive on study engagement. Neither of the empathy dimensions explained students' emotional exhaustion. The results indicate that merely teaching students to recognize and identify their peers' emotions is not sufficient to enhance study wellbeing, but they need to learn to share emotions and to tune into each other's emotions.

KEYWORDS

adolescents, affective empathy, cognitive empathy, empathy, study burnout, study engagement, structural equation modeling

Introduction

The diminishing levels of study wellbeing have become a growing concern among educational practitioners, policymakers, and researchers worldwide (e.g., Walburg, 2014; Yang and Chen, 2016; Salmela-Aro et al., 2021; Vinter et al., 2021). In Finland, it has been suggested that up to 21% of upper secondary education students have suffered from study burnout, whereas 33% reported experiencing positive study engagement (Finnish Institute for Health and Welfare, 2021). The challenge has been further added by the lock downs caused by the COVID-19 pandemic. Increased study burnout and reduced study engagement have severe consequences for both the individual and the society, including learning loss, increased risk of depression, and dropping out from school (e.g., Salmela-Aro et al., 2009b; Bask and Salmela-Aro, 2013; Symonds et al., 2016). Accordingly, efficient means to buffer study burnout and enhance study engagement are called after.

Peer relationships have been shown to play a key role in the development of study wellbeing (e.g., Ryan, 2001; Rubin et al., 2008; Mendoza and King, 2020). Respectively, problems in this domain can dilute efforts to promote students' study wellbeing made by teachers. Functional peer interaction provides the ability to recognize and identify the peer's emotions and tune into each other's emotional experiences; in other words, the empathy skills. Empathy skills are the core of receiving and providing well fitted social support that prevents study burnout and enhances study engagement among upper secondary school students, we believe. However, the effects of empathy on burnout and engagement so far have been explored primarily among healthcare professionals, social workers, teachers, and students within related fields (e.g., Wagaman et al., 2015; MacArthur et al., 2021; Wing et al., 2021). Accordingly, there is insufficient understanding on whether and how upper secondary education students' empathy skills are related to their study burnout and study engagement. We have contributed to filling this gap in the research by exploring the association between upper secondary education students' cognitive and affective empathy, and study burnout and study engagement.

Study wellbeing

Study wellbeing is a multidimensional construct referring to positive mental states, such as satisfaction, self-efficacy, and/or study engagement, combined with the absence of negative ones, such as study burnout or strain related to the studying, that together contribute to successful studying (Korhonen et al., 2014; Widlund et al., 2018). Study wellbeing is constructed through interactions between the students and their learning environment (Salmela-Aro and Upadaya, 2014). In this study,

we focused on upper secondary education students' study wellbeing in terms of study engagement and study burnout.

Study engagement is characterized by vigor, dedication, and absorption (Schaufeli et al., 2002; Salmela-Aro and Upadaya, 2012), and it has been suggested that it is a symbol of an optimal learning experience. The positive association between students' study engagement, life satisfaction and success in educational transitions has been detected in previous studies (see e.g., Salmela-Aro and Tuominen-Soini, 2010; Lewis et al., 2011). In turn, *study burnout* refers to a negative study experience resulting from prolonged study-related stress, characterized by three symptoms: *emotional exhaustion*, *cynicism*, and *sense of inadequacy* (Salmela-Aro et al., 2009a). *Emotional exhaustion* refers to chronic fatigue and lack of emotional energy, *cynicism* means alienation from the studying and perceiving the studying as meaningless, and *sense of inadequacy* is characterized by reduced sense of accomplishment in studying (Salmela-Aro et al., 2009a; Salmela-Aro and Upadaya, 2014). There is evidence that study burnout is related to other negative mental states, such as depression, and dropping out (e.g., Salmela-Aro et al., 2009b; Bask and Salmela-Aro, 2013; Symonds et al., 2016). Both development of study burnout and study engagement are socially embedded (e.g., Kiuru et al., 2008; Mendoza and King, 2020). This means that the quality and quantity of interactions in school with teachers and peers can either decrease or increase students' study wellbeing.

Peers play a significant role in the development of study engagement and burnout among students (see Ryan, 2001; Rubin et al., 2008; Mendoza and King, 2020). The quality of peer interaction and the effect it has on study wellbeing are dependent on the students' socio-emotional skills. However, prior studies focused heavily on the effect of identification and regulation of one's own emotions on study burnout and study engagement (e.g., Usán Supervía et al., 2019; Salmela-Aro and Upadaya, 2020; Vinter et al., 2021). Empathy skills, such as abilities to recognize peers' emotions and abilities in perspective taking and tuning into each other's emotions, which can be assumed to be crucial in functional peer interaction, and further, in the optimal development of study wellbeing, have rarely been the focus of those studies.

Empathy between peers

Empathy refers to an emotional response to the affective state or situation of another person (e.g., Feshbach and Roe, 1968; Eisenberg et al., 1991). Empathy has two dimensions: *cognitive empathy*, referring to ability to recognize and understand another's feelings, while *affective empathy* entails one's ability to share emotions or tune into another's emotional experiences (Eisenberg, 2004). It has been suggested that the cognitive and affective dimensions of empathy are distinct but related constructs playing different but complementary

roles in empathy (see Jolliffe and Farrington, 2006). The cognitive dimension includes the ability to understand how peers are thinking and feeling, but not necessarily sharing the feelings of another or resonating with those feelings (i.e., affective dimension). That the cognitive dimension might be a prerequisite for affective dimension has been proposed (see Feshbach and Roe, 1968; Lamm et al., 2010).

Previous studies have shown that empathy is positively associated with psychological wellbeing, positive behavior, such as prosocial behavior and problem solving, and negatively with antisocial behaviors such as aggressive behavior and engagement in conflicts (de Wied et al., 2006; Van Lissa et al., 2016; Laghi et al., 2018; van der Graaff et al., 2018; Vinayak and Judge, 2018). Low levels of empathy have been shown to be related to conflicts, aggression and bullying, respectively (Euler et al., 2017). Although the assets of well-developed empathy skills have been highlighted in the previous literature, it has also been suggested that it has downsides. For example, an association between high levels of empathy and internalizing problems, such as depression, has been detected (Calandri et al., 2019, 2021). The cognitive and affective dimension seem to be differentially associated with behavioral outcomes. The cognitive dimension has been shown to be positively related to indirect forms of aggression, while affective dimension has been associated with a decrease in relational and overt aggression (Batanova and Loukas, 2011, 2012). Moreover, without sufficient skills to overcome negative mental states, high levels of affective empathy may lead to co-rumination and increased risks of experiencing burnout symptoms *via* crossover or contagion (see Schwartz-Mette and Rose, 2012; Boren, 2013).

It has been shown that learning environments provided by a school play a role in the development of empathy and hence potentially in the development of study wellbeing: for example, receiving adequate support and acceptance from the teachers and peers can help students to learn to take others' perspectives (Batanova and Loukas, 2012). Farina et al. (2020) detected a positive association between students' affective empathy and exhaustion and showed that empathy as a whole contributed to higher levels of study burnout. High levels of empathy may contribute to the crossover of study burnout and study engagement by increasing the likelihood of emotional contagion (see Hatfield et al., 1992; Mendoza and King, 2020). This means that the students with high levels of empathy can be assumed to be more likely to "catch" their peers' study-related emotional states – both positive and negative – that can further contribute to their own study wellbeing, than students with low empathy levels. Also gendered differences in empathy have been detected. Girls typically report higher levels of empathy than boys (e.g., Jolliffe and Farrington, 2006; Mestre et al., 2009; Calandri et al., 2021). Moreover, individual variations in students' empathy levels are likely to occur. For example, adolescents are likely

to show more empathy for their peers than for their teachers or parents due to their experience of similar life conditions. However, to our knowledge, there are no measures of students' empathy specifically designed for measuring students' empathy toward their peers in educational settings. The empirical evidence of the role of empathy dimensions in study burnout symptoms and study engagement is limited. Hence, our study contributes to filling this gap by exploring the association between students' affective and cognitive empathy toward their peers, and study burnout symptoms and study engagement.

Aim of the study

The aim of this study was to advance the understanding of the function of students' empathy in educational settings by exploring the relationship between empathy and study wellbeing among upper secondary education students. First, we introduced an instrument for measuring students' empathy toward peers in educational settings and explored whether gender explained variation in empathy dimension (see e.g., Jolliffe and Farrington, 2006; Mestre et al., 2009; Calandri et al., 2021). Second, as the previous studies have not covered the effects of empathy skills on students' study well-being sufficiently, we explored the interrelations between cognitive and affective empathy and students' experiences of study burnout symptoms and study engagement (see Farina et al., 2020). Last, based on previous literature (see Feshbach and Roe, 1968; Lamm et al., 2010), we expected the cognitive empathy to be a prerequisite for affective empathy, and hence, explored the indirect effects of cognitive empathy (mediated by affective dimension) on study well-being. The following hypotheses were tested:

H1: Students' empathy skills comprise two components: (1) cognitive empathy and (2) affective empathy.

H2: Gender explains the variation in cognitive empathy (CE) and affective empathy (AE) (Jolliffe and Farrington, 2006; Calandri et al., 2021).

H3: The cognitive dimension of empathy (CE) explains the variation in the affective dimension of empathy (AE) (see Feshbach and Roe, 1968; Lamm et al., 2010).

H4: Both dimensions of empathy are directly related to study engagement (ENG) and study burnout symptoms, i.e., exhaustion (EXH), cynicism (CYN), and inadequacy (INAD) (Farina et al., 2020).

H5: The affective dimension of empathy mediates the association between cognitive empathy and study engagement (ENG), and study burnout symptoms (EXH, CYN, and INAD).

Materials and methods

Research context

Finnish children typically start their school career with pre-primary education at the age of six. At the age of seven, they start their 9 years of comprehensive schooling, consisting of primary (grades 1–6) and lower secondary schools (grades 7–9). After comprehensive school, at about the age of 16, the adolescents apply for entry into upper secondary education, which is either senior high school (academic track) or vocational schools, or a combination of these. Some students opt to attend a voluntary tenth grade. In the year of 2020, 54% of the adolescents who had completed the comprehensive school entered the upper secondary academic track, and 39% entered the vocational track (Statistics Finland, 2020).

Participants

The participants in the study were 280 students in upper secondary education. They were about 17 years old. Seventy-eight percent of them took the academic track ($n = 217$) and 21% took the vocational track ($n = 60$). Most of the participants were girls (69%, $n = 192$), while minority were boys (28%, $n = 79$). Of the participants, 3% ($n = 9$), disclosed “other” as their gender or did not want to specify it. Girls, and those on the academic track were overrepresented in the sample. The participants were from all over Finland, and both high (61%) and low (39%) socioeconomic neighborhoods in rural and urban areas were represented.

Data

The data collection was part of a larger, longitudinal research project. The participants had been involved in the study for 4 years, i.e., since 2017, when they were in the seventh grade. The data used in this study were collected between May and June 2021. The participants who had given their contact information ($N = 761$) and the permission to be contacted regarding the follow-up in the third stage of the data collection (in 2019) were sent a link to the online survey via SMS and e-mail. The data

were collected in the second year of their studying in upper secondary education, and they were about 17 years old. All the participants were informed about the study, and the participation was voluntary. They also gave their informed, written consent to participate in the study. Four gift cards (€100/each to verkkokauppa.com) were drawn as an incentive to participate in the study.

In Finland, ethical review is required when research involves intervention in the physical integrity of research participants, deviates from the principle of informed consent, involves participants under the age of 15 being studied without parental consent, exposes participants to exceptionally strong stimuli, risks causing long-term mental harm beyond that encountered in normal life, or signifies a security risk to subjects (Finnish National Board on Research Integrity, 2019, p. 19). None of these conditions were encountered in this study, and therefore no ethics review was required.

Measurement

In this study, we used the following scales: (1) empathy toward peers, consisting of two factors: *cognitive empathy* (five items) and *affective empathy* (four items), and (2) *study engagement* (nine items) (Salmela-Aro and Upadyaya, 2012), and (3) study burnout consisting of three factors: *emotional exhaustion* (three items), *cynicism* (two items), and *sense of inadequacy* (two items) (Salmela-Aro et al., 2009a). In addition, background variable, gender (female/male) was used. The *empathy toward peers*-scale was developed for the study by the authors. The cognitive empathy scale was modified from The Cognitive, Affective, and Somatic Empathy Scales (CASES) (Raine and Chen, 2018), and the affective empathy scale was inspired by Questionnaire measure of empathic tendency (Mehrabian and Epstein, 1972) and Multidimensional Emotional Empathy Scale (MDEES) (Alloway et al., 2016). We developed six items to measure cognitive empathy and six items for emotional empathy. The items were formulated to suit the educational context, and the items covered both positive and negative social, study-related emotions. Before data collection, the *empathy toward peers*-scale was tested and further developed based on a pilot study. In the pilot study, 22 upper secondary education students completed the survey and commented on the items. Cronbach's alphas were calculated for the factors (i.e., cognitive empathy and affective empathy) and based on these results, some of the items were removed.

Analyses

The descriptive statistics of the study variables, the correlations between them, and gendered differences in

empathy dimension were calculated with IBM SPSS Statistics 28.0. Other analyses were conducted using Mplus version 8.6.

First, the factorial structure of each scale (cognitive empathy, affective empathy, study engagement, and study burnout) was tested separately using confirmatory factor analyses. The measurement models were estimated using an MLR procedure which produces maximum likelihood estimates with standard errors and Chi-square test statistics that are robust to non-normality (Muthén and Muthén, 1998–2017), and the full information maximum likelihood method using all the information that is available in the data (Schafer and Graham, 2002). The goodness-of-fit of the estimated standardized models was assessed using a Chi-square test, Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Error of Approximation (SRMR). Correlations between some of the residuals were added to the measurement models when they significantly improved the model and were substantively meaningful (Byrne, 2012). Item reliability was explored by estimating the reliability coefficients (R-squared; [Supplementary Appendix 1](#)) and the structural validity by estimating the standardized factor loadings ([Supplementary Appendix 1](#); Hair et al., 2014). The internal consistency of the scales was examined by the factor determinacies and Cronbach alphas. Discriminant validity was explored by comparing the square root of the average variance extracted (AVE) values for each construct with the correlations between the different constructs (Fornell and Larcker, 1981) and by analyzing with Wald tests whether the correlations between the latent variables differed from one. Furthermore, multi-collinearity of the scales was examined using VIF (variance inflation factor) scores.

Second, the structural equation modeling (SEM) was used to determine the extent to which the hypothesized model was consistent with the data (Muthén and Muthén, 1998–2017; Byrne, 2012). The MLR procedure and the full information maximum likelihood were used (Schafer and Graham, 2002). The goodness-of-fit of the estimated standardized models was assessed using a Chi-square test, CFI, TLI, RMSEA, and SRMR. Gender was included in the model as an observed binary predictor variable. Other variables were included as latent variables. Independent samples *t*-test was used to further investigate the gendered differences in cognitive and affective empathy.

Results

The CFA results (see [Supplementary Appendix 1](#)) showed that the measurement models of students' cognitive empathy [$\chi^2(5) = 10.22, p = 0.07$, CFI/TLI = 0.994/0.988, RMSEA = 0.061 (90% CI: 0.00–0.12), SRMR = 0.015] and affective empathy [$\chi^2(1) = 4.35, p < 0.05$, CFI/TLI = 0.995/0.972, RMSEA = 0.109 (90% CI: 0.02–0.22), SRMR = 0.009] toward their peers

fitted the data (H1). *Cognitive empathy* reflected students' skills in recognizing and understanding their peers' emotional experience and perspective taking, while *affective empathy* focused on students' skills in tuning into their peers' emotions and reacting to them. The construct validity of the scales was considered sufficient from the perspectives of convergent construct validity and discriminant construct validity. The standardized factor loadings were adequate between observed variables and latent variables (≥ 0.50) (see [Supplementary Appendix 1](#)). The internal consistencies of the empathy scales were considered acceptable according to their Cronbach Alphas ([Table 1](#)), CR (> 0.70) and AVE (> 0.50) values, and factor determinacies (see [Supplementary Appendix 1](#)). In addition, discriminant validity between the empathy scales and the study burnout factors and study engagement scale was supported, with the square root of the AVE of each construct being higher than the correlation between the different constructs (Fornell and Larcker, 1981). The Wald tests also showed that the correlations between the latent factors differed significantly from one ($p < 0.001$) supporting sufficient discriminant validity between the scales. There were no signs of multi-collinearity either, as the VIF values of the empathy scales were below the threshold of 3.3 (Kock and Lynn, 2012).

On average, the students reported both high levels of cognitive empathy and affective empathy toward their peers (see [Table 1](#)). They reported increased levels of exhaustion and inadequacy, and moderate levels of cynicism. At the same time, the students reported experiencing elevated levels of study engagement. The study burnout symptoms correlated positively with each other and negatively with engagement. The cognitive and affective empathy were positively related to study engagement, and affective empathy was negatively related to cynicism.

The hypothesized model ([Figure 1](#)) was consistent with the data [$\chi^2(95) = 458.37, p < 0.001$, RMSEA = 0.048 (90% CI: 0.040–0.056), CFI = 0.959, TLI = 0.952, SRMR = 0.062]. The regression coefficients are shown in [Figure 2](#). As was hypothesized (H2), gender had an effect on cognitive empathy, which meant that girls scored higher in the cognitive dimension of empathy than boys. However, gender did not have direct effect on affective empathy. Further investigation on indirect effects (see [Table 2](#)) showed that there was a significant indirect path from gender to affective empathy. This indicates that, in the model, the girls who scored higher in cognitive empathy also scored higher in affective dimension, but gender did not contribute directly to variation in affective empathy. The differences between the means of cognitive empathy (girls: $M = 5.82$, $SD = 0.95$; boys: $M = 5.35$, $SD = 1.04$) and affective empathy (girls: $M = 5.70$, $SD = 1.02$; boys: $M = 5.19$, $SD = 1.15$) were significant [cognitive empathy: $t(269) = -0.3.55, p < 0.001$; affective empathy: $t(269) = -3.57, p < 0.001$]. The cognitive empathy contributed to higher levels in affective empathy (H3). This means that the students who recognized and identified

their peers' emotions skillfully, also tended to react and tune into emotional states of another person more easily. Some of the hypothesized direct effects of the empathy dimensions on study wellbeing were also detected (H4): The cognitive empathy was related to increased levels of cynicism and a sense of inadequacy. Cognitive empathy also had a direct negative effect on study engagement. Affective empathy was related to diminished levels of cynicism and sense of inadequacy, and increased levels of study engagement. However, neither dimension of empathy was related to exhaustion. These direct paths from empathy dimensions to study wellbeing suggest that the students' skills in recognizing and identifying their peers' emotional states might contribute to diminished levels of study engagement and increased levels of cynicism and inadequacy, while the students' skills in reacting and tuning into others' emotional states might protect them from cynicism and inadequacy and increase the levels of study engagement.

Further investigation of the indirect effects (see [Table 2](#)) showed that the affective dimension mediated the association between cognitive empathy and study wellbeing (H5): significant negative, indirect effects from cognitive empathy to inadequacy and cynicism were detected. Furthermore, an indirect positive effect was detected from cognitive empathy to study engagement. In other words, the affective empathy seemed to mediate the effect of cognitive empathy on cynicism, sense of inadequacy, and study engagement (H5). These indirect paths indicate that when students' skills in recognizing their peers' emotional states contributed to higher levels of affective empathy, they also had a positive effect on study wellbeing in terms of diminished cynicism and inadequacy, and increased study engagement.

Discussion

Findings in the light of previous literature

The aim of this study was to advance the understanding of the function of students' empathy in educational settings by exploring the relationship between empathy and study wellbeing among students. First, we introduced an instrument for measuring students' empathy toward peers in educational settings. Second, we explored the interrelations between cognitive and affective empathy, and students' experiences of study burnout symptoms and study engagement. The results showed that the students had well-developed empathy skills between themselves and their peers in terms of both the cognitive dimension and affective dimension; that is, they skillfully recognized if their peers' emotions in different situations and reacted easily to their peers' emotions. Being able to empathize with others allows us to relate with each other. It makes our thoughts, emotions, and behaviors more alike,

creating social glue and hence allowing students to build and sustain relationships with their peers. Based on our findings it seems that cognitive and effective empathy play different but organically complementary roles in students' ability to empathize with one of other.

Our results showed that cognitive empathy contributed to affective empathy between students, hence the students' skills in recognizing and understanding their peers' emotions was related to being able to tune to those feelings emotionally. The finding is in line with previous literature suggesting that cognitive dimension is a precedent for affective empathy (see [Feshbach and Roe, 1968](#); [Lamm et al., 2010](#)). Accordingly, our results indicate that being able to recognize peers' affective states is a precondition for being able to sufficiently tune oneself with such experience. [Van Lissa et al. \(2016\)](#) have suggested that of the empathy dimensions, perspective taking is more susceptible to developmental influences in adolescence ([Van Lissa et al., 2016](#)). It can be presumed that cognitive empathy, involving perspective taking, is also a central ingredient of co-regulation and prosocial behavior particularly when one does not necessarily agree with the collaborator's view. However, without affective toning, it is not enough to promote effective co-regulation.

Gendered differences were detected in cognitive and affective empathy. Hence, the results support previous evidence showing that girls typically score higher in empathy (e.g., [Jolliffe and Farrington, 2006](#); [Mestre et al., 2009](#); [Calandri et al., 2021](#)). Furthermore, our results showed that gender had an effect on cognitive empathy, and indirect effect on affective empathy implying that, in general, girls scored higher in cognitive empathy, and those girls who had well developed skills in cognitive empathy also scored higher in affective empathy. However, the gender did not have direct effect on affective empathy. This might indicate that gendered differences in students' empathy stem primarily from differences in their skills in perspective taking and abilities to recognize and understand others' emotions rather than in their ability to tune into their peers' emotions.

Further investigation showed that the students' empathy skills were related to their study wellbeing. We found out that the cognitive empathy contributed negatively to students' study wellbeing in terms of increased levels of cynicism, inadequacy, and decreased levels of study engagement. Hence, being sensitive to socio-emotional cues, particularly in recognizing peers' negative emotions, is likely to increase students' risk of experiencing those burnout symptoms that are more inter-personal in nature, i.e., cynicism and inadequacy, and simultaneously reduce the odds for experiencing study engagement. A reason for the negative association between cognitive empathy and study wellbeing might be that without the affectivity component, cognitive empathy only allows a student to recognize others' experiences, but not to relate to them, leaving them emotionally deprived of the social

TABLE 1 The descriptive statistics of the study variables and correlations between them.

	1. Cognitive empathy	2. Affective empathy	3. Study engagement	4. Exhaustion	5. Cynicism	6. Inadequacy
1. Cognitive empathy						
2. Affective empathy	0.670**					
3. Study engagement	0.215**	0.347**				
4. Exhaustion	0.052	−0.024	−0.297**			
5. Cynicism	−0.103	−0.275**	−0.553**	0.454**		
6. Inadequacy	0.044	−0.080	−0.392**	0.739**	0.626**	
No. of items	5	4	9	3	2	2
Cronbach's α	0.895	0.882	0.949	0.826	0.922	0.848
Mean	5.65	5.52	3.92	4.19	3.06	3.95
SD	1.02	1.12	1.39	1.61	1.80	1.82
Min/max	1.20/7	1/7	1/7	1/7	1/7	1/7

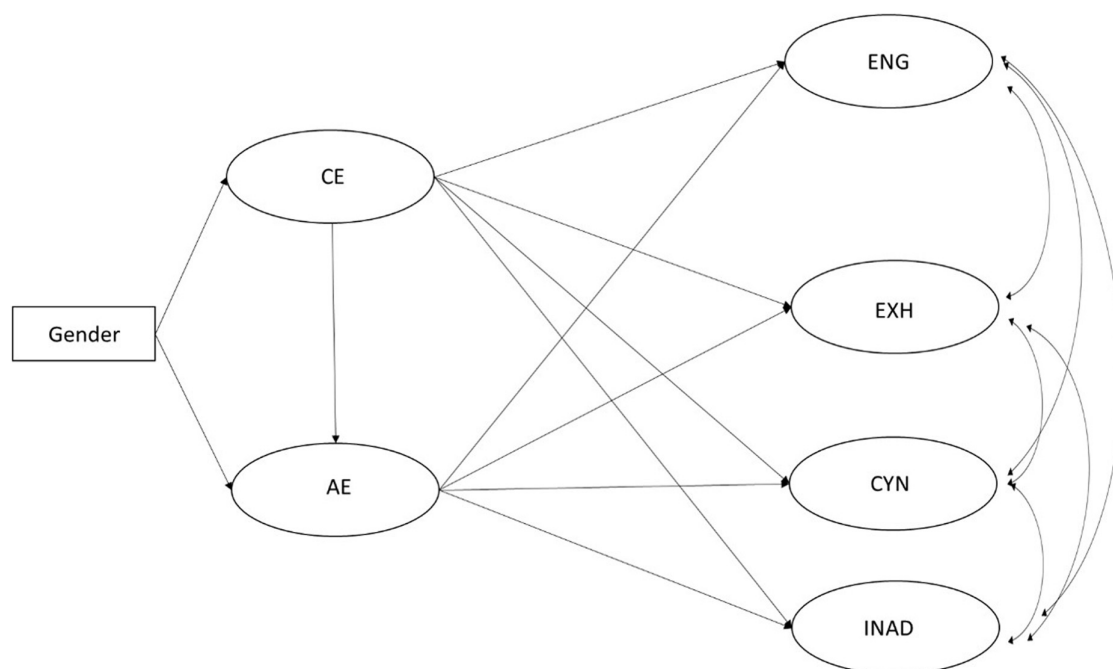
** $p < 0.001$.

FIGURE 1

Hypothesized model of the interrelations between the dimensions of empathy and study wellbeing.

fabric of peer relationship. If prolonged, such experience is likely to become painful, potentially further contributing to social exclusion.

In turn, the affective dimension seemed to have a twofold role in promoting the students' study wellbeing. First, it contributed directly to elevated levels of study wellbeing by reducing the risk of experiencing inadequacy and cynicism and increasing study engagement. The results indicated that students with well-developed affective empathy skills had a lower risk of study burnout and were more likely to feel vigor, dedication, and absorption while studying. A reason for this

might be that the students with high levels of affective empathy are more susceptible to getting the contagion of their peers' positive emotions (see Hatfield et al., 1992; Mendoza and King, 2020), which further increases their study wellbeing. On the other hand, affective empathy may promote study wellbeing by enabling the sharing of engaging study experiences with the peers. Second, affective empathy mediated the association from cognitive empathy to study wellbeing. Accordingly, it seemed that cognitive empathy promoted study wellbeing *via* affective empathy. The results indicate that merely recognizing peers' emotions and perspective taking can reduce students' study

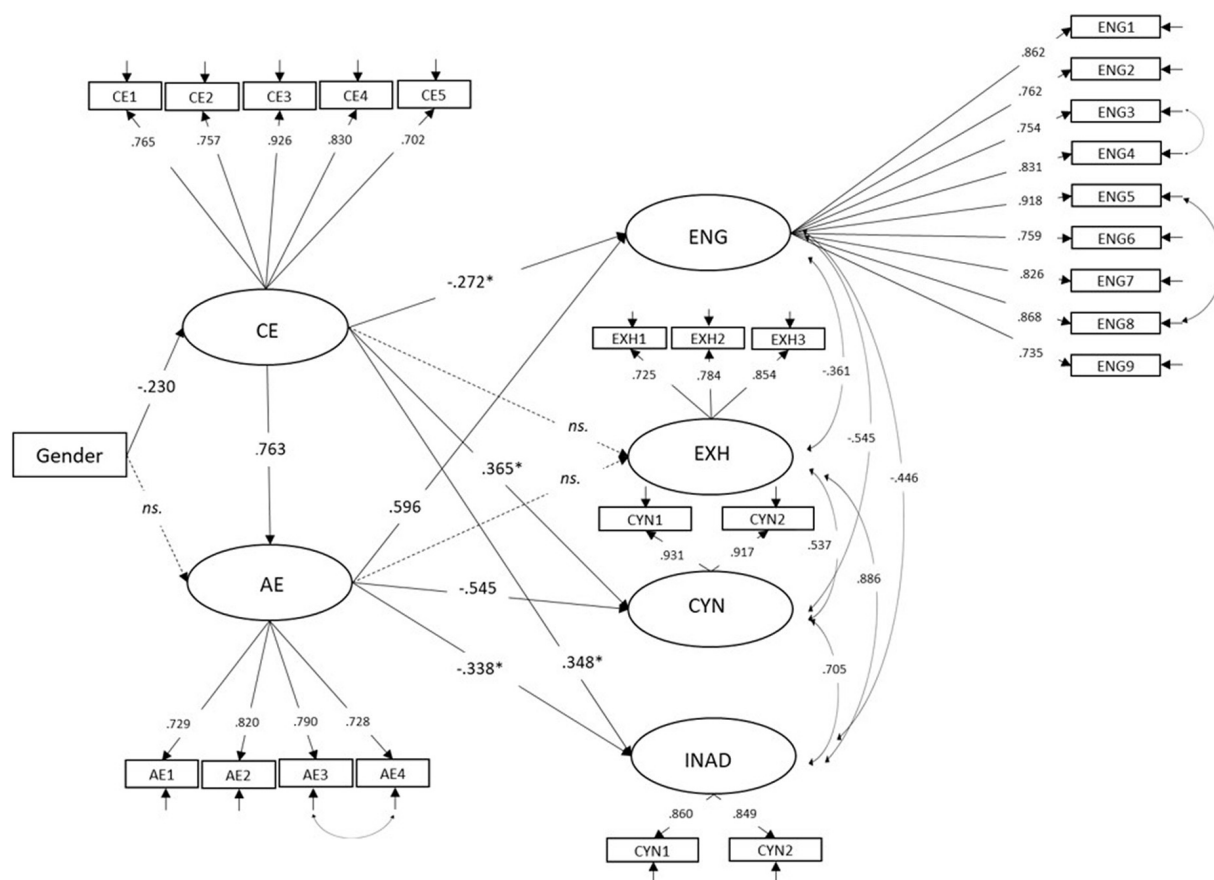


FIGURE 2

The structural equation model of the relations between latent variables of cognitive empathy (CE), affective empathy (AE), study engagement (ENG), emotional exhaustion (EXH), cynicism (CYN), and inadequacy (INAD). Standardized model. ns., indicates non-significant paths, * $p < 0.05$, all other parameters are significant at the $p < 0.001$ level.

wellbeing but combined with the ability to tune into their peers' emotional experiences it can provide a significant resource in promoting students' study wellbeing.

Contrary to the findings of Farina et al. (2020), we did not detect an association between the empathy dimension and emotional exhaustion. This can partly result from the differences in study designs. It is important to note that empathy skills were measured differently; we focused on empathy between peers, while Farina and others measured empathy in a more general sense. Students' empathy toward their peers is likely to increase the quality of peer interaction, which can further protect them from emotional exhaustion (see e.g., Ulmanen et al., 2022). However, their general empathy skills might not have direct effects to quality of peer interaction, and therefore, showing empathy to others might more easily lead to depletion of students' emotional resources. It is also important to keep in mind that most participants in our study were students on the academic track, while participants in the study by Farina et al. (2020) were at a school that prepared students in the helping professions, who have been shown to have high emotional

workloads. Another potential explanation for our finding might be that the primary source of exhaustion differs that from cynicism and inadequacy, which has been suggested are more inter-personal in nature, while exhaustion might result from study overload, and hence, is not affected to the same extent by empathy dimensions.

The study provides several directions for future research. First, as the results suggested that the recognition of another's emotions and perspective taking is not enough, reacting and tuning into other's emotions are needed to enhance study wellbeing. Accordingly, more studies exploring the teaching practices that enhance both dimensions of empathy are needed. For example, whether positive social support from the teacher could foster students' abilities to recognize their classmates' emotions and feel the joy and enthusiasm of another person should be studied. Second, the role of empathy in the spreading of study engagement and study burnout in the classrooms and peer groups should be addressed with longitudinal, nested data sets. Last, the differences in empathy dimensions between students are likely to occur, i.e., some students are likely to score

TABLE 2 Standardized indirect estimates, confidence intervals, and *p*-values.

	Effect	Lower 2.5%	Upper 2.5%	SE	<i>p</i>
Effects of cognitive empathy on study engagement					
Total	0.183	0.060	0.307	0.063	0.004
Direct	−0.272	−0.505	−0.038	0.119	0.023
Indirect (through affective empathy)	0.455	0.247	0.663	0.106	0.000
Effects of cognitive empathy on exhaustion					
Total	0.085	−0.053	0.222	0.070	0.227
Direct	0.223	−0.024	0.470	0.126	0.077
Indirect (through affective empathy)	−0.139	−0.346	0.069	0.106	0.191
Effects of cognitive empathy on cynicism					
Total	−0.051	−0.179	0.078	0.066	0.441
Direct	0.365	0.124	0.605	0.123	0.003
Indirect (through affective empathy)	−0.415	−0.629	−0.202	0.109	0.000
Effects of cognitive empathy on inadequacy					
Total	0.091	−0.038	0.219	0.066	0.166
Direct	0.348	0.083	0.614	0.135	0.010
Indirect (through affective empathy)	−0.258	−0.490	−0.025	0.118	0.030
Effects of gender on affective empathy					
Total	−0.225	−0.360	−0.090	0.069	0.001
Direct	−0.049	−0.173	0.074	0.063	0.432
Indirect (through cognitive empathy)	−0.175	−0.278	−0.073	0.052	0.001

high in both dimensions, some of them in one or the other, and others might have low scores in both dimensions. Knowledge of such empathy profiles could further increase the understanding of the interrelations between empathy dimensions and study wellbeing.

Practical implications

The findings have implications for promoting student wellbeing, particularly in upper secondary education. It might be that the students with well-developed skills in identifying their peers' emotions and taking the position of another person, but without affective empathy skills such as tuning into others' emotions, have a higher risk of study burnout. It could be beneficial to identify these students and monitor and support the quality of their peer interaction intentionally.

When teaching socio-emotional skills, it is important to consider that merely focusing on promoting adolescents' skills in recognizing and identifying their peers' emotions is not enough, as it may lead to a decrease in students' study wellbeing. Alongside promoting students' skills in looking at things from their peers' perspective and being able to identify their emotions, the students should be encouraged and trained to react and tune into each other's feelings, especially to positive ones such as enthusiasm. In other words, these skills should be taught simultaneously.

Methodological reflections and limitations

Several fit indices (RMSEA, CFI, TLI, and SRMR) indicated that the hypothesized model fit the data. However, according to the Chi-square test, the model fit was not acceptable (Miles and Shevlin, 2007; Iacobucci, 2010).

Cross-sectional design of this study does not allow us to draw causal conclusions. Longitudinal studies are needed to be able to say whether students' empathy skills contribute to their study wellbeing or another way around. In addition, although the respondents were all over the country, they were not randomly selected students. The girls and those on the academic track were overrepresented in the data, meaning that the sample was not representative of Finnish upper secondary students in these regards. Therefore, the findings cannot be reliably generalized to all upper secondary students in Finland, to other socio-cultural contexts, or other educational contexts. It is also important to keep in mind that the data were collected in the middle of the COVID-19 pandemic, which might have affected both the response rate and the responses, such as the levels of study engagement and burnout.

In this study, we introduced a new instrument designed for measuring students' empathy toward their peers in educational settings. The instrument included two separate scales: cognitive dimension and affective dimension. Contrary to findings of Baldner and McGinley (2014), the cognitive empathy scale was slightly more internally consistent than the one that assessed

affective empathy. However, in our study, based on Cronbach alphas and factor determinacies (Table 1 and Supplementary Appendix 1), the internal consistency of both scales was adequate. However, the reliability and validity of the scales need to be established in other socio-cultural contexts and other age groups.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

LT, HA, KP, TS, and JP contributed to original draft and its editing. LT contributed to conducting the analyses. All authors contributed to the article and approved the submitted version.

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Supplementary material

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Effects of the A+ intervention on elementary-school teachers' social and emotional competence and occupational health

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Teaching is, to date, one of the most prone jobs to experiencing occupational stress and burnout. Owing to burnout's negative personal, social, organizational and economic impacts, researchers, practitioners and education policy leaders are interested in developing practices and interventions aimed at preventing/reducing its prevalence. With teachers' main professional demands to be of a social and emotional nature, interventions designed with a view to promote teachers' social and emotional competence appears to be particularly promising, positively impacting teachers' well-being and personal accomplishment and contributing to a decrease in their psychological distress, namely emotional exhaustion. However, theoretical and empirically grounded interventions with ecological validity and specifically targeting teachers are still scarce. Thus, to bridge the previously identified gaps, the present study aimed to evaluate the efficacy and the quality of the intervention's implementation of the A+, an online social and emotional learning intervention for elementary-school teachers. A quasi-experimental study was conducted with a total of 81 participants (96.3% female, $M_{Age} = 46.21$, $SD_{Age} = 4.82$, $n = 42$ assigned to the experimental group) from three different school contexts. School clusters were similar in size, organizational structure and socioeconomic level, and as regards previous attendance at social and emotional learning interventions; however, they differed with regards to perceived organizational climate. Data on the efficacy of the A+ was collected across four waves using a set of self-report questionnaires that assessed proximal variables (i.e., social and emotional skills) and distal variables (e.g., well-being, burnout symptoms), and analyzed through Robust Linear Mixed-Effects Models. Coefficient omegas suggested adequate reliability of the measures. Additionally, two trained observers completed an observation grid to evaluate the quality of the A+ implementation (e.g., participant responsiveness, fidelity), with excellent inter-rater reliability. Results suggested that, over time, the A+ had positive impacts across proximal (e.g., increased self-regulation, positive relationship, conflict management skills) and distal variables (e.g., increased emotional well-being, decreased occupational stress and emotional exhaustion symptoms) favoring the experimental group. However, results differed across the school

contexts. These findings were accompanied by good implementation quality indicators, namely high fidelity in the delivery of the A+ contents and high participants' responsiveness. Despite its limitations, this study contributes to a growing body of research which reinforces the importance of investing in social and emotional learning interventions to prevent teachers' burnout and improve their occupational health. Furthermore, it highlights the importance of implementation quality research as a component of program planning with a view to enhancing programs' efficacy, as well as the need to adapt and consider context variables in research and practice.

KEYWORDS

elementary-school teachers, implementation quality, intervention efficacy, occupational health, online intervention, professional development, social and emotional learning

Introduction

Decades of research depict teaching as a highly demanding job which endorses the experience of chronic stress and burnout episodes (Maslach et al., 1996; Schaufeli and Buunk, 2003). Particularly, teachers are expected to cope with the daily challenges of their job (e.g., workload and time pressure, managing relationships with peers, school leaders, and students and their parents, dealing with criticism, classroom management) along with the new responsibilities that arise due to social changes (e.g., new teaching methods, curriculum content; Kyriacou, 2011). The period we have gone through in the last few years is a tangible example of this. Due to the SARS-CoV-2 pandemic outbreak, teaching demands have worsened in the last years, with teachers facing the need to adapt to new challenges, reinventing teaching methodologies and developing and perfecting their pedagogical, social, and emotional skills, whilst navigating adversity in their personal lives (e.g., Sokal et al., 2020; Kraft et al., 2021; Trinidad, 2021). Particularly, in Portugal, elementary-school teachers appear to have perceived the most teaching difficulties and decrease in their well-being in comparison with pre-school, middle and high-school teachers (Alves et al., 2021). Against this background, teaching is, to date, one of the professions with the highest risk of ill-health (European Commission, 2021), with many teachers presenting burnout symptoms (Varela et al., 2018; Marken and Agrawal, 2022). Consequently, teachers' occupational health, well-being, and performance are negatively impacted (Maslach and Leiter, 2016). Moreover, due to the co-regulative nature of classrooms, teacher burnout also indirectly compromises students' well-being and academic achievement (Jennings and Greenberg, 2009; Durlak et al., 2015; Gotlieb et al., 2022). In this scenario, to develop practices and interventions aimed at promoting teachers' occupational health and well-being gains especial relevance (Granziera et al., 2021; Gotlieb et al., 2022).

Interventions seeking to reduce teachers' burnout through the development of teachers' resources have increased in the last

decades. These interventions have been mostly individual-directed and adopted mainly cognitive-behavioral or, as observed more recently, mindfulness-based stress reduction strategies (Maricuțoiu et al., 2016). However, with regard to these interventions' efficacy, findings are remarkably inconsistent and often narrowed down to reducing emotional exhaustion symptoms (Maricuțoiu et al., 2016). Therefore, literature has stressed the need to investigate new intervention approaches that would complement traditional stress-reduction interventions (Maricuțoiu et al., 2016; Iancu et al., 2018). In this respect, Social and Emotional Learning (SEL) interventions have shown promising results in promoting teachers' occupational health and well-being (Oliveira et al., 2021a,b). Thus, with a view to contributing to the knowledge in this field, this study primary aims to evaluate the efficacy of the A+, an online SEL intervention program for elementary-school teachers. Moreover, following the literature in the field of intervention programs' development and evaluation (Fernández-Ballesteros, 1996; Durlak et al., 2015), this study also aimed to explore the role of organizational climate and quality of intervention's implementation (specifically the participants' responsiveness impact) in the program outcomes.

Impacts of social and emotional learning interventions on teachers' occupational health

Following the Job Demands and Resources (JD-R) model (Demerouti et al., 2001; Prieto et al., 2008), teachers' occupational ill-health stems from a perception of excessive job demands (e.g., time pressure and workload, interpersonal conflicts, coping with change) accompanied by the absence of personal and job resources to face these job strains (e.g., lack of autonomy, lack of emotion and behavior regulation skills, lack of organizational and social support; Kyriacou, 2001, 2011; Schaufeli and Taris, 2014). Specifically for teachers, the main sources of teachers' occupational

stress and burnout are variables of a social and emotional nature (Kyriacou, 2001, 2011). Thus, teachers' social and emotional competence (SEC; i.e., self-awareness, self-regulation, social awareness, relationship skills, and responsible decision-making; Durlak et al., 2015) have been highlighted as important protective factors to buffer against burnout and increase teachers' occupational health (Jennings and Greenberg, 2009; Schonert-Reichl, 2017). Hence, in the last 15 years, a rapid increase of interventions aiming to develop teachers' SEC, i.e., SEL interventions, has been witnessed (Oliveira et al., 2021a).

SEL for teachers is grounded in three main theoretical frameworks of reference (Jennings and Greenberg, 2009). First, the *Emotional intelligence theory* (Salovey and Mayer, 1990) which frames the five-core and interrelated domains of SEC that should be explicitly address within these interventions' content. Second, the *Transactional model of stress and coping* (Lazarus and Folkman, 1984) which provides information regarding the main teacher-specific stressors and informs on coping strategies to include in teachers' training. Lastly, the *Self-determination theory* (Deci and Ryan, 1985) which offers guidance on how to promote teachers' motivation for behavior change and learning. Overall, SEL interventions aim to enhance teachers' intra- and inter-personal development and their responsible decision-making skills, in the face of which they adapt and effectively respond to personal and professional challenges (Elias et al., 1997; Durlak et al., 2015). Empirical evidence has supported these interventions' efficacy in promoting teachers' SEC (e.g., emotional and behavioral regulation; e.g., Jennings et al., 2013, 2017, 2019; Carvalho et al., 2021). Moreover, prior research has also sustained these interventions' indirect effects on reducing teachers' psychological and physical discomfort, enhancing teachers' personal and professional well-being, and work performance. Specifically, effects have been found in reducing teachers' occupational stress and burnout symptoms (e.g., Roeser et al., 2013), ache-related symptoms, blood pressure and cortisol levels (e.g., Harris et al., 2016; Jennings et al., 2019), along with an increase of teachers' self-care practices and sleep quality (e.g., Harris et al., 2016; Crain et al., 2017), job and life satisfaction (e.g., Crain et al., 2017) and well-being (e.g., Jennings et al., 2013, 2019; Carvalho et al., 2021). Furthermore, SEL interventions for teachers have been linked to an increase in teachers' ability to manage their classrooms, providing greater emotional and instructional support for their students, and improving teacher-student interactions (e.g., Jennings et al., 2017; Carvalho et al., 2021). Taken together, these findings sustain that teachers who are more socially and emotionally competent are more effective in adapting and responding to personal and professional demands, displaying higher levels of occupational health and well-being, performance and positive interpersonal relationships. Recent meta-analyses have also sustained the promising contributions of these interventions in promoting teachers' perceived SEC, mitigating their psychological distress (namely emotional exhaustion symptoms), and improving teachers' well-being and personal accomplishment (Oliveira et al., 2021a,b). Additionally, due to the

co-regulative nature of classroom interactions, socially and emotionally competent teachers also appear to foster their students' SEC, well-being, and academic achievement (Jennings and Greenberg, 2009; Carvalho et al., 2021).

Overall, SEL interventions for teachers appear to support the development of teachers' resources (namely personal and non-work specific), which are particularly important in mitigating the impact of teachers' job demands (Bianchi et al., 2021). Particularly, as regards teacher burnout prevention, SEL interventions appear to be especially effective in promoting teachers' personal accomplishment, when targeting (pre-) kindergarten and elementary-school teachers (Oliveira et al., 2021b). In a scenario resulting from the SARS-CoV-2 pandemic outbreak, where teachers' social and emotional job demands (e.g., work-life balance, time management, workload, interpersonal relationships/conflict, emotional regulation; Sokal et al., 2020) were exacerbated to an unprecedented extent, SEL interventions for teachers are even more necessary (Gotlieb et al., 2022), particularly for elementary-school teachers (Alves et al., 2021).

Nevertheless, despite these promising contributions, prior literature signals the need to further invest in the development of theoretically and empirically grounded (Durlak et al., 2015) and culturally adapted interventions (Granziera et al., 2021), which has not yet been seen across the majority of SEL interventions for teachers (Oliveira et al., 2021a). Thus, in the context of this study, we aimed to evaluate the efficacy of the A+, an online SEL intervention program for elementary-school teachers. This study is part of a larger investigation trial aiming at the planning and evaluation of a culturally adapted, theoretically and empirically grounded SEL intervention program, specifically developed for Portuguese elementary-school teachers. In a previous stage, a needs assessment study ensuring empirical support, cultural adequation and ecological validity to the intervention's contents and methodologies, along with a pilot study for the assessment of a trial version of the A+'s social validity and efficacy was conducted (see Oliveira et al., under revision). In this stage, resorting to the A+'s expected efficacy and in accordance with prior literature findings, the following research hypotheses were established:

H1: The A+ intervention program will enhance teachers perceived social and emotional competencies across time and when compared with the control group.

H2: The A+ intervention program will positively impact teachers' self-care practices, sleep quality, and well-being (H2a) and negatively impact teachers' occupational stress and burnout symptoms (H2b) across time and when compared with the control group.

Furthermore, in line with what has been seen in other intervention approaches with teachers (Iancu et al., 2018), SEL interventions for teachers have been mostly individual-directed

not explicitly considering contextual-level factors (Oliveira et al., 2021a). Moreover, prior literature also stresses the need to develop more methodological robust studies aiming at SEL program evaluation (Oliveira et al., 2021a). Specifically, there is need to investigate time stability (i.e., maintenance, or not, of the intervention's effects over time) and the possible sleeper effects (i.e., long-term lagged effects which require some incubation time and, so, are not immediately present at posttest) of SEL interventions, namely through follow-up assessments (Oliveira et al., 2021a). Additionally, it is important to consider the role of implementation quality variables (such as fidelity, quality, and participants' responsiveness), since both have been less studied and may interfere with the interventions' efficacy outcomes (Berkel et al., 2011, 2018; Humphrey et al., 2018; Oliveira et al., 2021a).

The relationship between organizational climate and teachers' SEC

The role of social and contextual dimensions is depicted consistently throughout the different theoretical frameworks which frame teachers' SEL and occupational health. However, although different models (e.g., Collie's (2020) social and emotional competence school model; Jennings and Greenberg's (2009) prosocial classroom model; and Marchand et al.'s (2015) multilevel determinants of workers' mental health model) describe the influence of contextual dimensions on teachers' SEC, occupational health and well-being, research and practice which contemplates the impact of contextual variables is still scarce (Oliveira et al., 2021a). Thus, to date, literature continues to highlight the need to assess the role of contextual variables in teachers' personal and professional outcomes (Schaufeli and Taris, 2014; Collie, 2017).

In the context of teachers' occupational health and well-being, organizational climate has been a primary focus of research (Schaufeli and Taris, 2014). Organizational climate refers to the set of single characteristics that are perceived by the personnel, making each working context unique and influencing the workers' behaviors (Hoy and Tarter, 1992). Due to its strong links to teachers' emotions and behaviors (Collie, 2017), prior research has pointed to organizational climate as a predictor of teachers' job satisfaction, efficacy, stress and burnout symptoms (Collie et al., 2012, 2018; Skaalvik and Skaalvik, 2018; Ford et al., 2019).

The work context characteristics have not only been directly linked to teachers' occupational (ill-)health symptoms, but research has also sustained that subjective evaluation of the contextual variables determines the efficacy of different resources in responding to job demands (Taris et al., 2017). Recent studies also suggested a positive association between a closed or unhealthy organizational climate and lower personal resources (e.g., lower SEC) (Collie et al., 2012; Collie, 2017, 2020). Moreover, the demands that arose from the SARS-CoV-2 pandemic outbreak also impacted the contextual dimensions (namely organizational and social support) which were previously linked to teachers'

personal resources (e.g., SEC) and their occupational health (Sokal et al., 2020, 2021; Kraft et al., 2021; Trinidad, 2021). Thus, in the face of heightened job demands and teachers' consequent increased vulnerability to occupational stress and burnout, interventions should consider contextual variables in their assessment needs, content development and efficacy evaluation (Schaufeli and Bakker, 2004).

Therefore, in this study, teachers perceived organizational climate was considered as one of the central variables of this study. Not only context-specific needs were accounted for during the development of the intervention's contents and methodologies (*vide* section "Intervention" for further detail), as the impact of the organizational climate on teachers' SEC was also assessed in this study. Therefore, the following research question was established:

Q1: Does organizational climate predict the degree of teachers' SEC pre-intervention?

The role of implementation quality in program evaluation

Since they may interfere with the intervention's efficacy, prior literature on SEL for teachers signals the scarcity in assessing implementation quality variables as one of the main weaknesses of current investigation on the existing SEL programs (Berkel et al., 2011, 2018; Humphrey et al., 2018). Following the model proposed by Berkel et al. (2011, 2018), two core parameters are likely to interfere with the intervention's outcomes: the facilitator behaviors (i.e., fidelity, quality, and adaptation) and the participants' behaviors (i.e., responsiveness). To date, even scarce, prior studies on SEL for teachers have mainly addressed the impact of fidelity on program outcomes (Oliveira et al., 2021a). However, even when fidelity is ensured, participants' responsiveness (i.e., their active participation/engagement and attendance) may directly impact participants' individual learning and development (Humphrey et al., 2018; Schussler et al., 2020). Therefore, this study aimed to assess the A+'s quality of implementation and its relationship with the intervention's outcomes. Hence, the following research question was established:

Q2: Was the A+ implemented with quality? If so, how does participants' responsiveness impact the degree of teachers' SEC post-intervention?

Figure 1 depicts the proposed conceptual model of relationships between the variables under study.

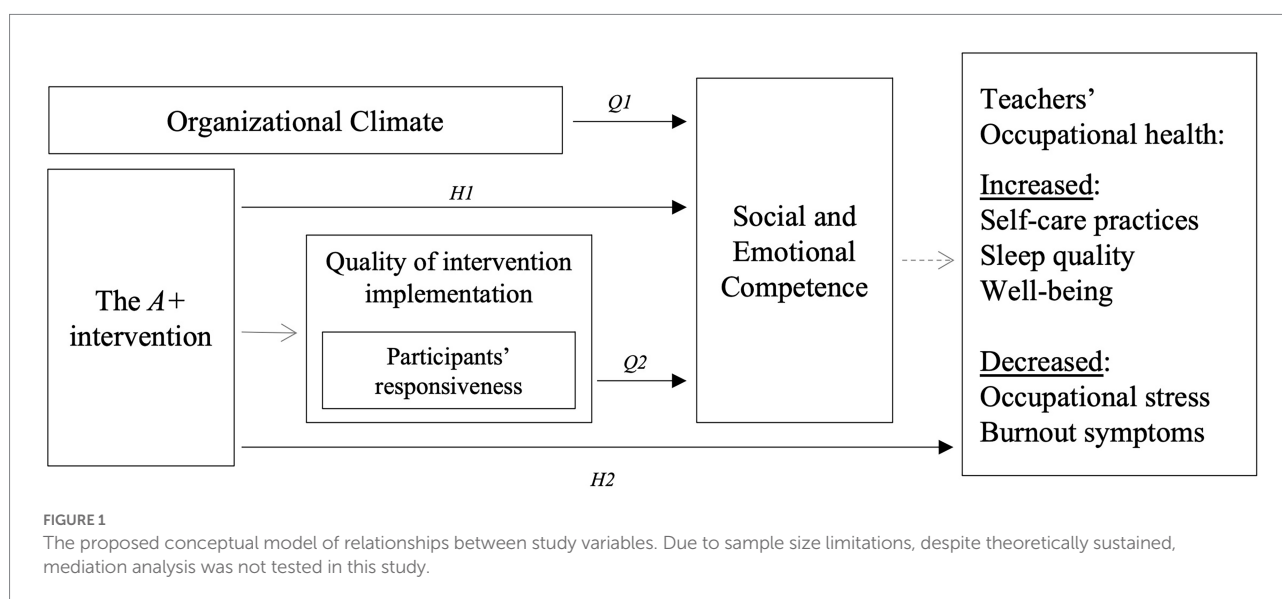
Materials and methods

Participants

Eighty-one elementary-school teachers (96.3% female, $M_{Age} = 46.21$ years, $SD_{Age} = 4.82$) enrolled in the study. The

TABLE 1 Participants' sociodemographic characteristics between school clusters (percentage of the most frequent category, mean and standard deviation).

	Cluster A		Cluster B		Cluster C	
	%	<i>M</i> (<i>SD</i>)	%	<i>M</i> (<i>SD</i>)	%	<i>M</i> (<i>SD</i>)
Gender (Female)	100.00		100.00		92.30	
Age		44.60 (4.33)		47.36 (4.78)		46.38 (4.97)
Years of teaching experience in the school cluster		7.60 (6.53)		15.64 (8.07)		10.31 (8.04)
Highest Educational Qualification (Master)	80.00		59.10		69.20	
Frequency of prior SEL interventions (No)	70.00		72.70		71.80	

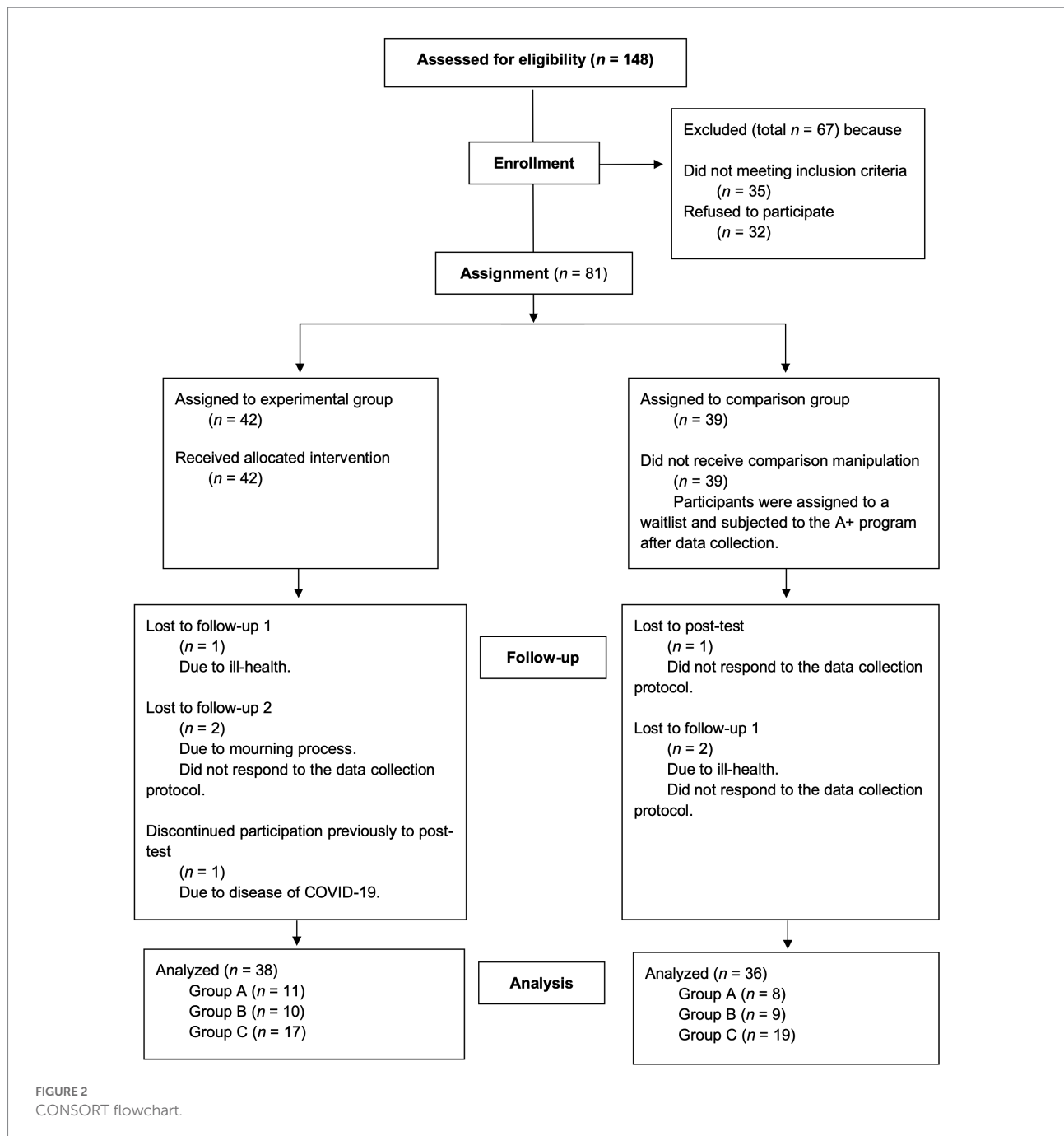


participants had a mean of 11.08 ($SD=8.18$) years of teaching experience and were practicing in state elementary schools from three different school clusters (referred to as Clusters A, B and C) across the Lisbon Metropolitan Area. Table 1 depicts a detailed characterization of the participants between the school clusters. Prior to this study, 71.6% of the participants had never attended a SEL intervention. The three school clusters were similar in size and also in terms of organizational structure and socioeconomic level. The experimental group (EG) included 42 participants, whilst the waitlist control group (CG) was comprised of 39 participants. Thirty-eight teachers from the EG and 36 teachers from the CG completed all four data collection waves. The overall attrition rate (8.64%) and the differential attrition rate (1.81%) at follow-up 2 were low under the optimistic threshold (CONSORT flowchart is depicted in Figure 2).

Despite the similarities on geographic location, size, organizational structure, and socioeconomic level, the three school clusters differed regarding perceived SEL needs and professional demands and resources. Professional demands and resources were acknowledged both on a personal level (i.e., individual characteristics which either hinder or promote teachers' performance) and on a contextual level (i.e., aspects from teachers'

immediate work environment or indirect/cultural environment perceived to either hinder or promote teachers' performance). In keeping with the findings of the prior study on the needs assessment of these contexts (Oliveira et al., under revision), we were able to understand that teachers from the Cluster A were those who identified the most professional demands at an indirect/cultural environment level (e.g., media, laws, social beliefs). At the same time, this was the school cluster where teachers perceived to have more personal resources (e.g., professional self-efficacy, work-life balance). Nevertheless, emotional regulation and, consequently, the experience of negative emotions and related symptoms, emerged as the primary risk factor of a personal level within this school cluster.

On the other hand, teachers from the Cluster B were the ones who described a greater balance between professional demands and resources. This was the school cluster to acknowledge the most protective work environment, with teachers identifying strong and supportive networks with their peers and the school leaders, and fewer risk factors in comparison with the Clusters A and C. Nevertheless, this was also, in comparison, the cluster where teachers made less references to personal resources, identifying emotional regulation as their greatest challenge.



Lastly, teachers from the Cluster C were those who recognized more professional demands, particularly at the personal (e.g., strains managing pedagogical relationships, emotional regulation, professional demotivation and turnover intention) and work environment (e.g., segregation of schools within the school cluster) levels. Complementarily, teachers from this school cluster referred to social support networks with peers as the strongest resource at the school level, although they also perceive a lack of contact with their peers. Full detail on the three clusters' SEL needs, and perceived professional demands and resources are

described in a previous qualitative study covering the needs assessment which underlie the A+ development (see Oliveira et al., under revision).

Measures

Evaluation of the intervention's efficacy

The *Social and Emotional Competence Assessment Battery for Adults* (Oliveira et al., in press) was used to evaluate teachers'

SEC. This battery integrates three independent questionnaires in a total of 37 items. The *Intrapersonal competence questionnaire* consists of two scales: Self-awareness (7 items, e.g., “In my daily life, I am able to identify and name my emotions when they occur.”; $0.79 < \omega_{T1-T4} < 0.82$) and Self-regulation (8 items, e.g., “I can adapt (e.g., thinking differently) towards new information or situations.”; $0.80 < \omega_{T1-T4} < 0.87$). The *Interpersonal competence questionnaire* is composed of two scales: Positive relationship (8 items, e.g., “I give appropriate feedback (e.g., timely, constructive).”; $0.78 < \omega_{T1-T4} < 0.83$) and Conflict management (8 items, e.g., “In the face of a conflict with someone I know, I am able to listen carefully to what that person is saying to me rather than trying to “read” their mind.”; $0.70 < \omega_{T1-T4} < 0.85$). The *Responsible Decision-Making competence questionnaire* is a unidimensional questionnaire composed of six items (e.g., “When I have a problem, I can think of alternative solutions.”; $0.71 < \omega_{T1-T4} < 0.82$). Items were evaluated on a 5-point scale (from 1 – *Never or hardly ever* to 5 – *Almost always or always*).

The *Positive and Negative Affect Schedule* (Watson et al., 1988; Portuguese version by Galinha and Pais-Ribeiro, 2005) was used to assess teachers perceived positive and negative affect. This questionnaire consists of 20 items organized in two scales: Positive affect (10 items, e.g., “Excited”; $\omega_{T1-T4} = 0.92$) and Negative affect (10 items, e.g., “Afraid”; $0.90 < \omega_{T1-T4} < 0.91$). For each item participants were asked to rate how often they had felt each described emotion over a two-week period. The items were evaluated on a 5-point scale (from 1 – *Very slightly or not at all* to 5 – *Extremely*).

To measure how participants regulate their emotions in the face of different situations, the *Emotion Regulation Questionnaire* (Gross and John, 2003; Portuguese version by Vaz and Martins, 2008) was used. The questionnaire comprises 10 items organized in two scales: Cognitive reappraisal (6 items, e.g., “I control my emotions by changing the way I think about the situation I’m in.”; $0.87 < \omega_{T1-T4} < 0.91$) and Expressive suppression (4 items, e.g., “I keep my emotions to myself.”; $0.73 < \omega_{T1-T4} < 0.81$). Items were evaluated on a 7-point scale (from 1 – *Strongly disagree* to 7 – *Strongly agree*).

A *Self-care scale* (adapted from Vala et al., 2016) was used to assess teachers’ self-care behaviors. Four items were selected as indicators of self-care behaviors regarding physical activity, leisure, eating habits, and socialization with friends. The items were answered considering a three-months period (e.g., “Considering the last 3 months, how do you evaluate the care you have taken of yourself in terms of the practice of planned and regular physical exercise?”) and evaluated on a 5-point scale (from 1 – *Not at all satisfied* to 5 – *Totally satisfied*). The internal consistency for the total scale ranged from 0.71 to 0.80.

An indicator of subjective sleep quality retrieved from the *Pittsburgh Sleep Quality Index* (Buysse et al., 1989; Portuguese version by Rodrigues et al., 2014) was used to assess how teachers perceived their overall sleep quality in the previous month (i.e., “Considering the last month, how would you evaluate the overall

quality of your sleep?”). The item was evaluated on a 4-point scale (from 1 – *Very bad* to 4 – *Very good*).

Teachers’ well-being was measured through the *Mental Health Continuum – Short Form* (Keyes et al., 2008; Portuguese version by Matos et al., 2010). The questionnaire comprises 14 items organized in three scales: Emotional well-being (3 items, e.g., “how often have you felt happy?”; $0.89 < \omega_{T1-T4} < 0.92$), Psychological well-being (6 items, e.g., “how often did you feel that you had experiences that challenged you to grow and become a better person?”; $0.91 < \omega_{T1-T4} < 0.93$), and Social well-being (5 items, e.g., “how often did you feel that you had something important to contribute to society?”; $0.82 < \omega_{T1-T4} < 0.89$). Items were evaluated considering the frequency of the described symptoms in the previous month on a 6-point scale (from 0 – *Never* to 5 – *Every day*).

An indicator of *Perceived occupational stress* (adapted from Kyriacou and Sutcliffe, 1978) was used to assess the degree to which teachers perceived their job as a stressful activity (i.e., “To what extent do you consider being a teacher as a stressful activity?”). The item was evaluated on a 5-point scale (from 1 – *Not at all stressful* to 5 – *Extremely stressful*).

Perceived experience of burnout symptoms was evaluated using the *Maslach’ Burnout Inventory – Educators Survey* (Maslach et al., 1996; Portuguese version by Marques-Pinto et al., 2005). The questionnaire is composed of 22 items organized in three dimensions: Emotional exhaustion (9 items, e.g., “I feel emotionally drained by my work.”; $0.91 < \omega_{T1-T4} < 0.93$), Depersonalization (5 items, e.g., “I feel students blame me for some of their problems.”; $0.85 < \omega_{T1-T4} < 0.88$), and Personal accomplishment (8 items, e.g., “I have accomplished many worthwhile things in this job.”; $0.83 < \omega_{T1-T4} < 0.84$). Items were evaluated on a 7-point scale (from 0 – *Never* to 6 – *Every day*).

The *Organizational Climate Description Questionnaire Revised for Elementary Schools* (Hoy and Clover, 1986; Portuguese version by Oliveira et al., 2022) was used to assess teachers’ perceptions of their school climate. This measure integrates 40 items organized in six scales. Three scales pertain to management behaviors at a leadership-level: Professional relationships management (10 items, e.g., “School coordinators listen and accept suggestions from teachers.”; $0.91 < \omega_{T1-T4} < 0.92$), Pedagogical tasks management (8 items, e.g., “School coordinators closely check the teaching practice.”; $0.79 < \omega_{T1-T4} < 0.85$), and Bureaucratic tasks management (5 items, e.g., “Administrative work is a burden at my school.”; $0.65 < \omega_{T1-T4} < 0.75$). The remaining three scales relate to teachers’ behavior within the school: Professional interactions among teachers (6 items, e.g., “Teachers help and support each other.”; $0.79 < \omega_{T1-T4} < 0.89$), Personal interactions among teachers (7 items, e.g., “Teachers socialize with each other regularly.”; $0.82 < \omega_{T1-T4} < 0.85$), and Dynamic of the teachers’ group (4 items, e.g., “Faculty meetings are useless.”; $0.64 < \omega_{T1-T4} < 0.81$). Items were evaluated on a 4-point scale (from 1 – *Rarely occurs* to 4 – *Very frequently occurs*).

Evaluation of the quality of the intervention implementation

To assess the quality of intervention implementation, systematic observation based on a *Synchronous Sessions Observation Grid* (SSOG) was performed by two trained independent observers. The SSOG was designed in the context of this study following [Berkel et al.'s \(2011, 2018\)](#) model and covers different parameters of the intervention implementation which are related to the program outcomes, namely facilitator behaviors (i.e., *fidelity* – one indicator concerning the concretization of session aims and another one relative to the staging of the activities on schedule; *quality* – one indicator related to the use of interactive teaching methods (e.g., brainstorming) and one indicator related to the clinical process skills (i.e., the ability to positively engage the participants in the session, to promote cohesion among the participants, and to present active listening and skillful feedback); and *adaptation* – one indicator reporting if any changes (modification, addition, or subtraction of contents) were performed in relation to the initial session plan) and the participants' behaviors (i.e., *group responsiveness* – assessed through the participants' active participation in the session). The fidelity-related indicators (e.g., “The session's goals were accomplished.”) were rated on a 5-point scale varying from 1 – *None* to 5 – *All*. The clinical process skills (e.g., “The facilitator was capable of engaging the participants in the session.”) and active participation (i.e., “The participants actively participated in the proposed activities.”) items were rated on a 5-point scale varying from 1 – *Nothing* to 5 – *Very much*. Lastly, the items regarding interactive teaching methods (i.e., “Were interactive teaching methods used in the session?”) and adaptation (i.e., “During the implementation of the session, were any changes made in relation to the initial session plan?”) were rated on a dichotomous scale (0 – *No*, 1 – *Yes*), indicating whether or not interactive teaching methods and adaptations were used during the session. To estimate inter-rater reliability, a two-way mixed effects Intraclass Correlation Coefficient (ICC; absolute agreement) was performed. The ICC for inter-rater reliability was excellent (ICC = 0.98, 95% CI [0.97, 0.99]; [Koo and Li, 2016](#)). In addition to the SSOG, we have also evaluated: responsiveness of each participant, assessed individually for each participant through an indicator of participants' active participation (rated on a 10-point scale ranging from 1 – *Did not participate at all* to 10 – *Participated constructively at all sessions*); attendance (i.e., measured through the number of sessions in which the teachers were present; maximum 10); and satisfaction (i.e., teachers evaluate their satisfaction throughout the training course on a 5-point scale ranging from 1 – *Not at all satisfied* to 5 – *Totally satisfied*; [Berkel et al., 2011, 2018](#)).

Procedures

Data collection

Before we began recruiting participants, ethics approval for this study was obtained from the Scientific and Ethical Council of

the Faculty of Psychology, University of Lisbon. School clusters were selected by convenience and authorization to conduct the study was obtained from the school principals. Elementary-school teachers within the school clusters and who complied with the eligibility criteria were invited to participate. Potential participants were contacted through their school's training center and attended a meeting held by the first author where the study aims and participation procedures were described. Participants were self-selected.

As for the inclusion criteria, participants had to be teaching an elementary-school class (grades 1 to 4) during the school year in which the data collection occurred. Also, three exclusion criteria were considered: (1) teachers who did not have a class assigned; (2) teachers who were performing coordinating and/or supporting roles at the school-cluster; and (3) teachers who were responsible for teaching extracurricular activities, were not eligible for the study. As we followed a between-subjects design, after indicating their intention to enroll in the study and prior to pretest, the teachers were randomly assigned to either the EG or the CG within their school group. Written informed consents were obtained from the participants and data confidentiality and anonymity were ensured. Data collection protocols were identified with an alphanumeric code created by the participants themselves, allowing data to be crossed between the four data collection waves without revealing the participants' identity. Following, the World Medical Association's Declaration of Helsinki ([WMA - World Medical Association, 2013](#)), we ensured the participation was voluntary and the teachers could withdraw their participation at any time.

The A+ intervention program was delivered in the form of a training course throughout 10 weekly-sessions and was accredited by the Pedagogical Scientific Council of Continuing Education (50-h for teachers' career development). The training sessions were provided online for the participants within the EG across the three school clusters (i.e., 10 sessions × 3 groups), with support of the Zoom software and in collaboration with the schools' training center. A trained and certified instructor, specializing in Educational Psychology, was responsible for delivering all the training sessions to the three intervention groups. The participants did not pay for the training course, however they were required to attend at least 2/3 of the sessions to receive the certificate. The teachers assigned to the waitlist CG did not have any intervention during this time but attended the A+ after completion of the fourth data collection wave, in the same terms as the participants assigned to the EG.

To assess the quality of the intervention implementation, the SSOG was completed by a trained observer at all 30 training sessions. To ensure data validity and assess inter-rater reliability, a second trained observer simultaneously filled in the observation grid at 1/3 of the training sessions. The second observer was present at all 10 different sessions of the A+, although some may not have been delivered to the same group of participants.

To evaluate the A+'s efficacy, data was collected in four waves, simultaneously for the EG and the CG: prior to the intervention's 1st training session (pretest held in September 2020), immediately

after the last training session (posttest held in December 2020), 3 months after posttest (follow-up 1 held in March 2021), and 6 months after posttest (follow-up 2 held in June 2021). To guarantee social, cultural, and linguistic validity of the measures, we used Portuguese versions of all selected instruments and we ensured that their psychometric qualities had been previously studied with Portuguese samples. The data collection protocol was completed online through the *Qualtrics* platform¹ and had an average response time of 30 min. All participants received a link to access the data collection protocol with the same instructions and at the same time, throughout the four data collection points. There were no missing values, since the software notified the participants of the need to complete their responses before submission. Also, participation was only registered when the full data protocol was completed. Regarding outliers' detection, the analysis of the Q-Q plots depicted a tendency towards normal distribution of the data across the four data collection waves (i.e., $|z| < 3$; Kline, 2016). To reduce Social Desirability Bias (SDB), the anonymity and confidentiality of the responses were ensured, and a statement encouraging honesty was included at the beginning of the protocol (Larson, 2019).

Intervention

The A+ is an online intervention program which sought to promote teachers' SEC. As previously addressed, it builds on a prior study which tackles the planning of the intervention by means of a needs assessment within the intervention contexts and a pilot study to evaluate the social validity and efficacy of a trial version of the program (Oliveira et al., under revision). The SEL framework for teachers (Elias et al., 1997; Jennings and Greenberg, 2009; Durlak et al., 2015), the JD-R model (Demerouti et al., 2001; Schaufeli and Taris, 2014), and Collie's (2020) Social and Emotional Competence School model ensured theoretical ground for the development of the A+'s contents and methodologies. While findings from previous studies on SEL interventions' efficacy (Collie et al., 2012, 2018; Jennings et al., 2013, 2017, 2019; Carvalho et al., 2021) and on good practices for effective SEL (Durlak et al., 2010) and online (Hofmann, 2014; Beatty and Binnion, 2016; Kintu et al., 2017) interventions ensured the empirical ground for it.

More specifically, the SEL framework for teachers (Elias et al., 1997; Jennings and Greenberg, 2009; Durlak et al., 2015) informed on specific SEC domains that should be addressed (i.e., self-awareness, self-regulation, social awareness, relationship skills and responsible decision-making), and on specific behavioral and motivational strategies to promote the desired behavioral change (e.g., problem-focused coping strategies). The JD-R model (Demerouti et al., 2001; Schaufeli and Taris, 2014) provided support for the teacher-specific stressors and their associations with the variables that are expected to be impacted by this

intervention (e.g., teacher burnout). Lastly, Collie's (2020) Social and Emotional Competence School model depict an interactive process in which the development of SEC stem from an urge for autonomy, competence and relatedness needs satisfaction (Deci and Ryan, 1985), and that is influenced by the individual's context and perceived social support. Hence, training groups were built within the same school cluster and different group activities were proposed to increase relatedness and teachers' social support networks among peers.

Concerning its contents, the intervention program includes five components organized on the basis of stress-generating situations identified in the needs assessment: *Personal organization and time management* (seeking to promote teachers' ability to set and achieve their goals, optimize their productivity, and to increase their adaptability skills in order to feel more comfortable in welcoming change and adjusting to new information or situations), *Emotional awareness and regulation* (aiming to promote teachers' awareness of their individual characteristics, emotions and behaviors, and their ability to self-regulate their own emotions and consequent behaviors and decisions both in regular and challenging situations), *Conscious communication* (seeking to promote teachers' open communication which contributes to their ability to build positive relationships and to collaborate with others), *Conflict management* (aiming to promote teachers' ability to effectively prevent and manage conflict situations and negative social interactions and to work collaboratively towards finding common solutions while respecting others), and *Personal leadership* (seeking to promote teachers' ability to make ethical and constructive decisions, evaluate and reflect on their behaviors, and to effectively solve problems). Table 2 depicts the structure, main contents, and examples of activities of the intervention program.

Regarding its structure, the A+ consisted of a total of 50 h of training, 25 of which were delivered in 10 weekly 2.5-h in-group synchronous sessions and 25 of which consisted in asynchronous training. The 25 h of synchronous training sessions were delivered through the *Zoom* software. The 25 h consisting of asynchronous training were supported by the *Moodle* platform. Each component of the A+ had approximately 5 h of synchronous training (i.e., two training sessions). The intervention program followed the SAFE guidelines for interventions (i.e., sequenced training activities; active learning methods; focus on the development of SEC; and explicit SEL aims; Durlak et al., 2010). Thus, all the sessions included both expositive (e.g., introduction of new concepts, lectures) and active (e.g., brainstorming, role-playing) moments, and ended with a homework assignment (i.e., a weekly exercise related to the contents covered in the synchronous session and which aimed to help teachers implement the competences and skills addressed in their daily lives). Further description of the A+ contents and structure, the specific procedural and methodological precautions for online interventions that were adopted, as well as illustrative examples of the *Zoom* and *Moodle* elements are depicted in the [Supplementary materials](#).

¹ <https://www.qualtrics.com>

TABLE 2 Structure and contents of the A+ intervention program.

Module	SEC domains	Specific skills addressed	Main goal and example activity	Reflection topics
I – Personal organization and time management (Sessions 2 and 3)	Self-awareness and self-regulation	<ul style="list-style-type: none"> · Accurate self-perception · Goal setting and achieving · Organizational skills · Adaptability 	<p><i>To set SMART goals:</i> Teachers perform a self-evaluation through a SWOT analysis. Based on these results, teachers are asked to identify specific social and/or emotional skills that require more investment. Then, teachers are guided to establish a SMART goal for one of these skills.</p> <p><i>To increase work-life balance, through time organization:</i> Participants begin by identifying the main obstacles to their productivity which compromise their work-life balance. Next, through brainstorming, the group is guided to share strategies for personal organization and time management that they use and consider to be effective. Then, the facilitator presents a structured set of personal organization and time management strategies. Finally, teachers are asked to, for each obstacle previously identified, establish a strategy to test.</p>	<ul style="list-style-type: none"> · The impact of 21st century demands on teacher stress and burnout · The importance of goal setting and strategic planning · Importance of work-life balance for well-being, occupational health, and performance
II – Emotional awareness and regulation (Sessions 4 and 5)	Self-awareness and self-regulation	<ul style="list-style-type: none"> · Emotional self-awareness · Emotional and behavioral regulation · Accurate self-perception · Self-efficacy · Optimism 	<p><i>To develop emotional awareness:</i> The “<i>Discovering Emotions</i>” activity begins with a group reflection in which teachers reflect on their personal definition of emotion, emotion versus feeling, what emotions are for, the existence of good and bad emotions. Next, main thoughts are systematized by the facilitator. The facilitator then presents the theoretic content to answer the questions previously raised. The functions of the six primary emotions are explored as well as the physiological, cognitive, and behavioral dimensions of emotion.</p> <p><i>To manage emotional symptoms:</i> During the exercise “<i>Physiology and State</i>”, teachers are asked to become aware of their physiological symptoms and emotional state while hearing the facilitator describe a positive and a negative situation. This is followed by a reflection on the importance of interpretation and thoughts in emotional states. Teachers are then guided, through changes in their body posture, to promote an emotional state of self-efficacy, strength and readiness.</p>	<ul style="list-style-type: none"> · Function of emotion and the importance of feeling the full emotional spectrum · The role of thoughts and beliefs in the emotional experience · Importance of emotional regulation
III – Conscious communication (Sessions 6 and 7)	Social awareness and relationship skills	<ul style="list-style-type: none"> · Open communication · Active listening · Empathy · Awareness of communication styles and non-verbal communication signs · Organizational awareness 	<p><i>To develop open communication and active listening skills:</i> The activity “<i>Wheel of Feelings</i>” consists of four rounds of increasing difficulty. In each round, participants are asked to, individually, answer a question while the remaining participants must actively listen to the answer. In the 1st round, participants must say whether they feel good or bad, at the present moment. In the 2nd round, they are asked to use an adjective to describe their physical state. In the 3rd round, participants must describe their emotional state with an adjective. In the last round, participants must explain why they are feeling any of the feelings expressed. In all rounds, participants can pass, and the response is voluntary. At the end, the discussion is open to the group, reflecting on the exercise.</p>	<ul style="list-style-type: none"> · The importance of verbal and non-verbal communication · The importance of conscious communication in interpersonal relationships · The role of growth mindset in ones’ attitude toward learning

(Continued)

TABLE 2 (Continued)

Module	SEC domains	Specific skills addressed	Main goal and example activity	Reflection topics
IV – Conflict management (Sessions 7 and 8)	Social awareness and relationship skills	<ul style="list-style-type: none"> · Taking perspective and appreciate diversity · Being receptive to others' feedback · Respect for others · Teamwork and collaboration 	<p><i>To develop effective conflict management strategies:</i> In the exercise “<i>Managing a Difficult Conversation</i>”, teachers are asked to visualize two different situations they have experienced with the same person. One of them should represent a happy moment in which they felt connected to that person. The other situation should allude to a moment of conflict. The teachers should try to externally observe the two situations and analyze their behavior (e.g., emotional state, body posture, tone, communication style), identifying similarities and discrepancies. The facilitator then presents a set of conflict management strategies that teachers can implement from then on. Next, the participants are split into small groups and given a script which presents a conflict situation in which only one part of the conversation is presented. In small groups, the teachers should, applying the presented strategies, respond to the interlocutor of the script, in order to effectively manage the conversation. At the end, a spokesperson from each group presents the answer given by the group, thus, the large group tries to identify the implemented strategy and different possibilities.</p> <p><i>To promote teamwork and collaboration:</i> In the “<i>Effective Communication at Work</i>” exercise, teachers are asked individually to identify a situation that they would like to see improved in their work context. The teachers then organize themselves into small groups and together come up with solutions/strategies that promote this change.</p>	<ul style="list-style-type: none"> · Assertiveness and respect for differences · The importance of teamwork and collaboration toward goals
V – Personal leadership (Sessions 9 and 10)	Responsible decision making	<ul style="list-style-type: none"> · Problem identification and situation analysis · Problem-solving · Behavior evaluation and reflection · Making decisions 	<p><i>To make decisions:</i> In this activity teachers are asked to establish a decision and then perform a best/worst analysis towards that decision. Teachers should anticipate the pros and cons of moving forward with that decision and of not moving forward. At the end, in a large group, teachers share their conclusions and experience with the exercise.</p>	<ul style="list-style-type: none"> · Consequences of decisions and behaviors

Session 1 corresponded to an introductory session where the participants introduced themselves to the group and shared their expectations with the intervention. Also in this 1st session, the program structure was depicted, and the specific topics to be addressed were outlined. The platforms used and their specific resources and completion requirements were also presented in detail during this session. Session 7 appears in both modules III and IV since the topic of interpersonal conflicts was introduced in the 2nd part of the session.

Data analysis

Reliability of the measures was studied through internal consistency calculated with the coefficient omega (ω ; Peters, 2014). Internal consistency was considered adequate for values above a minimum of .50, and good when scores were equal to or above .70 (Crutzen and Peters, 2017). Analyses were computed using the *effects* (effect displays for linear, generalized linear, and other models; Fox and Weisberg, 2019), *effectsize* (indices of effect size and standardized parameters; Ben-Shachar et al., 2020), *lme4* (linear mixed-effects models using 'Eigen' and S4; Bates et al., 2015), *robustbase* (basic robust statistics; Maechler et al., 2022), *robustlmm* (robust linear mixed effects models; Koller, 2016), *ufs* (a collection of utilities; Peters and Gruijters, 2021), and *WRS2* (collection of robust statistical methods; Mair and Wilcox, 2020) packages designed for R environment (R Core Team, 2019).

Intervention's efficacy

First, as the present study aimed to evaluate the impact of the A+ on the outcome variables, baseline analyses were performed to explore whether there were any initial differences between the school clusters, namely regarding the sociodemographic, SEC, and contextual variables. Due to the sample size within the clusters, all the analyses were performed using robust statistics. Thus, robust one-way ANOVAs based on trimmed means (20% trimming level) and *post hoc* tests were performed, at baseline, to compare sociodemographic, organizational climate and SEC variables between the school clusters. Then, to address our research question and anticipating a relationship between contextual and proximal dependent variables, Spearman correlations were computed to evaluate the association between organizational climate and SEC, and robust linear regression models were performed to evaluate whether perceived organizational climate predicted teachers' SEC at baseline. Following Cohen's (1988) criteria, correlation values around 0.10, 0.30, and 0.50 illustrate small, moderate, and large associations, respectively. To test our research hypotheses, the data analyses were performed within school clusters. Thus, robust one-way ANOVAs were also computed to analyze baseline differences across sociodemographic, organizational climate and SEC variables between the treatment conditions within school clusters. To account for family-wise error rate, the Holm-Bonferroni method was used for multiple comparisons (Mair and Wilcox, 2020; Maechler et al., 2022). Lastly, to test our research hypotheses, robust linear mixed effects models with 95% confidence intervals (CI) with bootstrap for the estimates were performed within school clusters to test for the intervention effects on the outcome variables. Interaction effects between the treatment conditions and the four data collection waves were estimated while controlling for the variables proving to be significant at baseline. To evaluate the magnitude of the findings, effect sizes with 95% confidence intervals with bootstrap were calculated for robust one-way ANOVAs using the Partial Eta Squared (η^2). For robust regression and mixed effects models,

effect sizes were measured using Cohen's f (f^2). Estimates were considered significant whenever the 95% bootstrapped confidence intervals did not include 0.

Quality of the intervention implementation

Regarding the indicators of quality of the intervention's implementation and their impacts on the program outcomes, fidelity, quality, and group responsiveness indicators were computed. Total indicators of fidelity, quality, and group responsiveness were calculated through the average evaluation across the 10 synchronous sessions. Partial indicators of fidelity, quality, and group responsiveness allowing a more refined understanding of the implementation processes were estimated through the average evaluation of the synchronous sessions within each program component. Additionally, robust linear regression models were computed within the school clusters following the previously stated analytical strategy (see Section "Intervention's efficacy") to evaluate if participants' individual responsiveness predicted their perceived SEC at posttest.

Results

Baseline analysis

Comparisons between school clusters regarding demographic, contextual and proximal dependent variables

Regarding the demographic variables, statistically significant differences between the school clusters were found for teachers' years of teaching experience ($F(2, 28.1) = 7.62$, $\eta^2 = 0.52$, 95% CI [0.28, 0.73]), with participants from Cluster B presenting longer years of teaching experience than teachers from Cluster A ($\hat{\Psi} = -10.83$, 95% CI [-17.92, -3.74]) and from Cluster C ($\hat{\Psi} = 7.74$, 95% CI [0.38, 15.10]). No differences were found regarding teachers' age and previous attendance at social and emotional learning interventions.

Concerning perceived organizational climate, robust ANOVAs depicted statistically significant differences between the school clusters for two dimensions: Professional relationships management ($F(2, 30.59) = 9.10$, $\eta^2 = 0.54$, 95% CI [0.34, 0.78]) and Personal interactions among teachers ($F(2, 26.43) = 4.01$, $\eta^2 = 0.40$, 95% CI [0.20, 0.67]). Post-hoc comparisons revealed that Cluster B presented higher perceptions of Professional relationships management than Cluster A ($\hat{\Psi} = -0.50$, 95% CI [-0.82, -0.19]) and Cluster C ($\hat{\Psi} = 0.45$, 95% CI [0.08, 0.82]). Cluster B also presented higher perceptions of Personal interactions among teachers than Cluster C ($\hat{\Psi} = 0.31$, 95% CI [0.01, 0.64]). No statistically significant differences were found between clusters A and C.

No differences were found regarding teachers' SEC between the school clusters.

Relations between organizational climate and proximal dependent variables

The correlation analysis indicated that, at pretest, all the organizational climate dimensions presented statistically significant associations with some of the teachers' assessed SEC variables, except for Professional relationships management (Supplementary Table S1). A subsequent robust linear regression analysis revealed that, at baseline, Positive affect was positively predicted by Bureaucratic tasks management ($B=0.30$, $SE=0.11$, 95% CI [0.07, 0.53], $R^2=0.06$, $f^2=0.27$), and Expressive suppression was positively predicted by Pedagogical tasks management ($B=0.66$, $SE=0.32$, 95% CI [0.01, 1.30], $R^2=0.11$, $f^2=0.28$). Moreover, Professional interactions among teachers was a positive predictor of perceived Self-regulation ($B=0.46$, $SE=0.15$, 95% CI [0.15, 0.76], $R^2=0.07$, $f^2=0.54$), Positive relationship ($B=0.41$, $SE=0.19$, 95% CI [0.02, 0.79], $R^2=0.13$, $f^2=0.53$), and Conflict management ($B=0.50$, $SE=0.15$, 95% CI [0.20, 0.79], $R^2=0.28$, $f^2=0.63$) skills. Conflict management was also negatively predicted by Personal interactions among teachers ($B=-0.39$, $SE=0.10$, 95% CI [-0.59, -0.19], $R^2=0.28$, $f^2=-0.47$).

These analyses supported the relationship between contextual variables and the proximal dependent variables, with perceived organizational climate predicting teachers' SEC. Additionally, baseline comparisons between the school clusters also revealed statistically significant differences across perceived organizational climate. Thus, analyses of the intervention program's efficacy and the quality of the intervention's implementation were performed within the school clusters.

Comparisons between treatment conditions within school clusters regarding demographic and outcome variables

No differences were found between the treatment conditions at baseline for Cluster A. Within Cluster B, no differences were found regarding demographic variables, however the EG evidenced a higher positive relationship ($F(1, 13.96)=4.85$, $p=0.045$, $\eta^2=0.48$, 95% CI [0.09, 0.93]) and responsible decision-making ($F(1, 11.80)=5.10$, $p=0.044$, $\eta^2=0.49$, 95% CI [0.03, 1.06]) skills at baseline compared to the CG. As for Cluster C, the teachers in the EG revealed higher expressive suppression ($F(1, 21.71)=8.69$, $\eta^2=0.66$, 95% CI [0.34, 0.93]) and lower positive relationship skills ($F(1, 22.46)=5.61$, $\eta^2=0.46$, 95% CI [0.03, 0.83]) than the teachers in the CG. No differences were found regarding demographic variables in this school cluster.

Intervention's efficacy

In order to help determine the direction of change, Supplementary Tables S2–S4 in the Supplementary material present the means and standard deviations for all the dependent variables for the EG and CG within the school clusters and across time.

Cluster A

The analysis of baseline differences between the treatment conditions showed no differences across the demographic and outcome variables. Robust linear mixed effects models evidenced interaction effects on teachers' SEC and burnout symptoms, favoring teachers from the EG. Regarding SEC, the teachers who attended the A+ program showed a decrease in negative affect and an increase in self-regulation skills at follow-up 1, and an increase of cognitive reappraisal and decrease in expressive suppression at follow-up 2. Concerning the distal dependent variables assessed, the teachers from the EG reported a decrease of emotional exhaustion symptoms at posttest. A graphical representation of the interaction effects is presented in Figure 3.

Cluster B

After controlling for significant baseline variables (i.e., positive relationship and responsible decision-making), the results showed increased negative affect within the EG at posttest (Figure 4). No other interaction effects were reported regarding Cluster B.

Cluster C

After controlling for significant baseline variables (i.e., expressive suppression and positive relationship skills), the findings showed statistically significant interaction effects favoring the EG across teachers' perceived SEC, self-care, well-being, and occupational stress (Figure 5). Concerning the proximal dependent variables, the teachers who had attended the program presented: a decrease in expressive suppression at follow-up 2, an increase in positive relationship at follow-up 1, and an increase in conflict management skills at posttest, follow-up 1 and follow-up 2. Regarding the distal dependent variables measured, the teachers who had attended the A+ evidenced higher self-care practices at follow-up 1 and follow-up 2. Moreover, the teachers from the EG also showed improved sleep quality at follow-up 1 and follow-up 2, emotional well-being at posttest and follow-up 2, and a reduction of perceived occupational stress intensity at follow-up 1.

Quality of the intervention implementation

The means and standard deviations of the total and partial indicators of intervention implementation quality across the school clusters are depicted in Table 3. No statistically significant differences regarding the SSOG's quality of implementation's indicators or the individual participants' responsiveness were found between the school clusters. Assessment of Interactive teaching methods revealed that active methodologies (e.g., individual and group reflections, role-playing, written exercises, brainstorming) were present at all sessions throughout the school clusters, justifying the absence of variability found in the table ($M=1.00$, $SD=0.00$). Also, the facilitator was perceived to present clinical process skills consistently throughout the sessions and across the training groups ($M=5.00$, $SD=0.00$, except for the

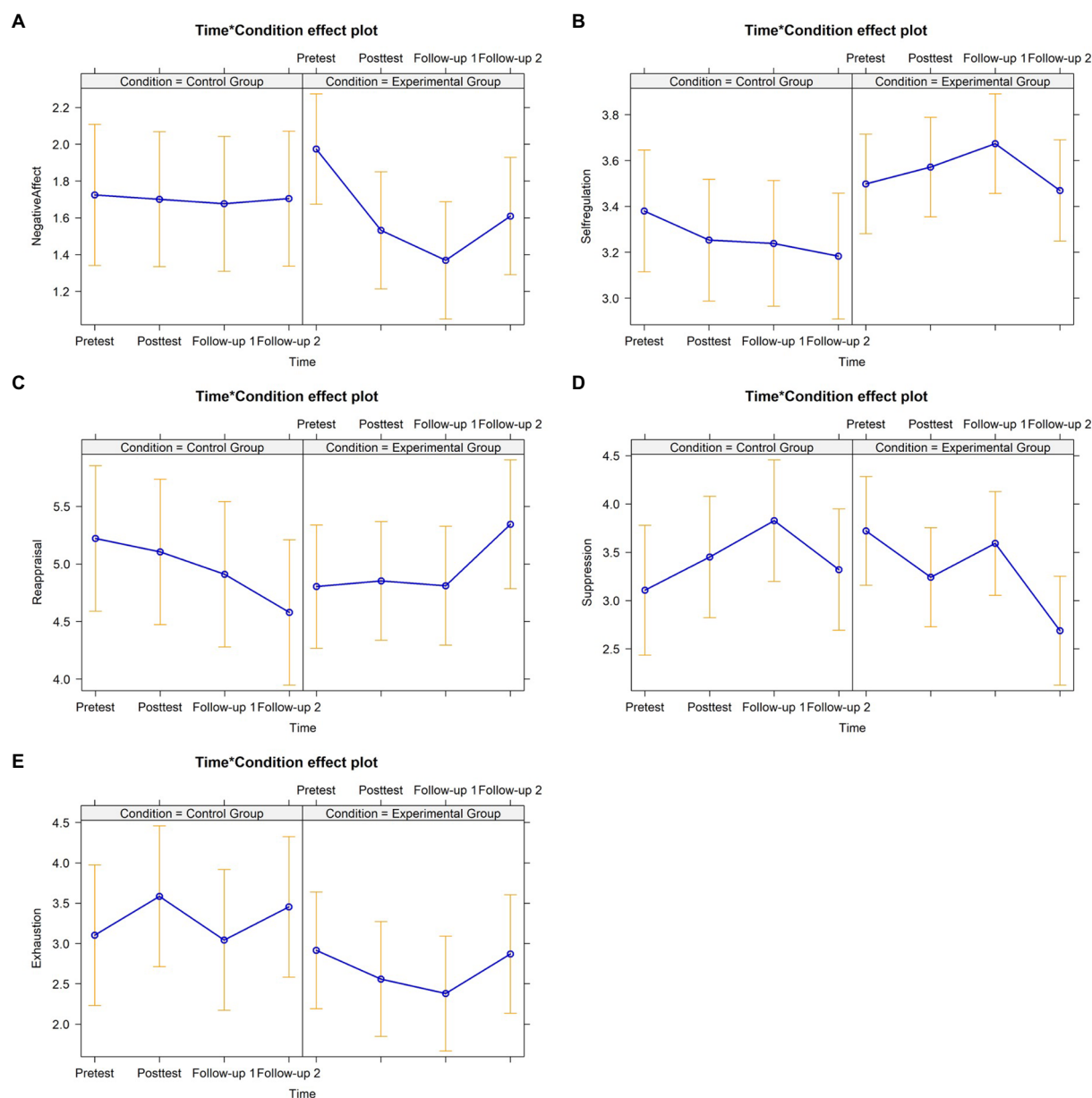


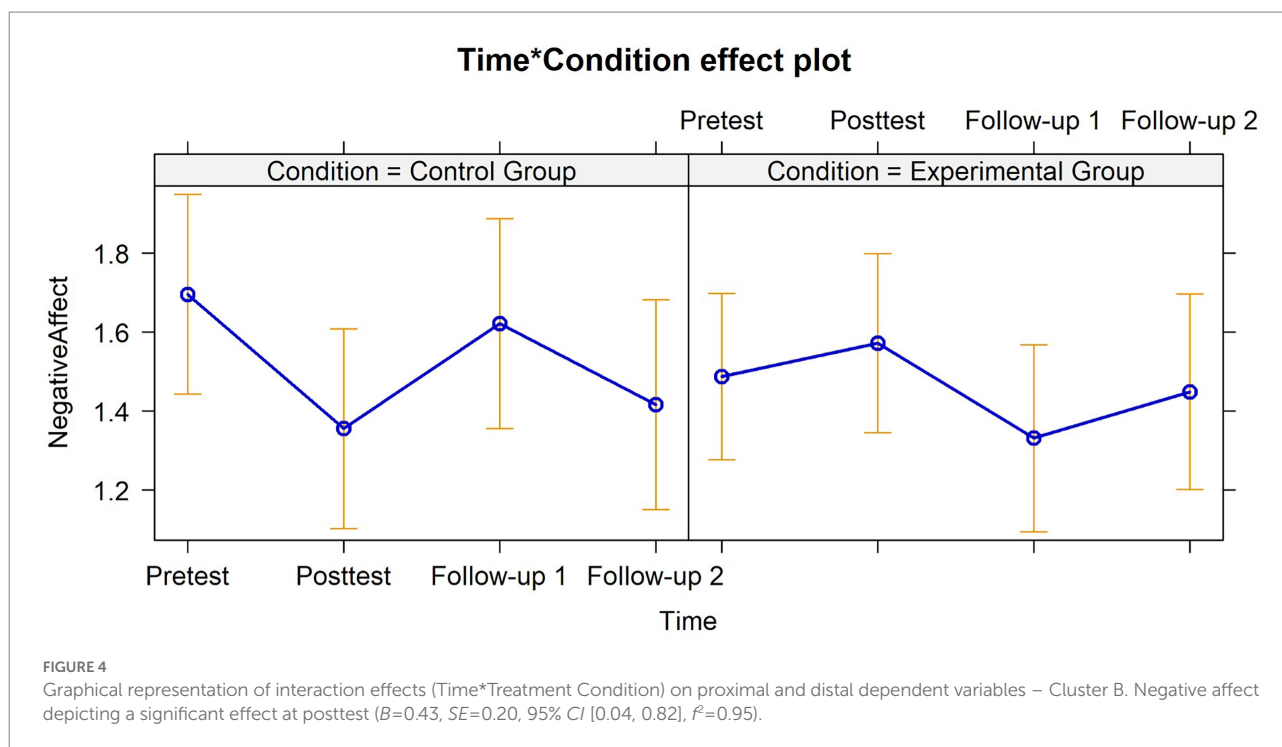
FIGURE 3

Graphical representation of interaction effects (Time*Treatment Condition) on proximal and distal dependent variables – Cluster A. **(A)** Negative affect depicting a significant effect at follow-up-1 ($B=-0.56$, $SE=0.26$, 95% CI $[-1.06, -0.06]$, $r^2=-0.91$). **(B)** Self-regulation skills depicting a significant effect at follow-up-1 ($B=0.32$, $SE=0.14$, 95% CI $[0.04, 0.59]$, $r^2=0.78$). **(C)** Cognitive reappraisal depicting a significant effect at follow-up-2 ($B=1.18$, $SE=0.51$, 95% CI $[0.18, 2.18]$, $r^2=1.38$). **(D)** Expressive suppression depicting a significant effect at follow-up-2 ($B=-1.25$, $SE=0.61$, 95% CI $[-2.44, -0.05]$, $r^2=-1.38$). **(E)** Emotional exhaustion symptoms depicting a significant effect at posttest ($B=-0.84$, $SE=0.40$, 95% CI $[-1.62, -0.06]$, $r^2=-0.71$).

Cluster A's 1st training component). Specifically, the facilitator was perceived to be able to positively engage the participants in the session, to promote cohesion among the participants, and to present active listening and skillful feedback. Regarding the participants' own evaluation of the quality of implementation, Satisfaction with the program was high, particularly for the Cluster C. Also, all clusters showed a good Attendance to the sessions, with Group B showing the highest rate of presence.

Cluster A

An analysis of both the facilitator and participants' behaviors revealed good quality of intervention implementation results for all the program components. Some adaptations were made in the Personal organization and time management (namely, at the group's request, no break was held), Conscious communication (namely, in Session 6, the duration of the activity "Wheel of Feelings" was extended from the initial plan, motivated by the



pertinent sharing and reflections of the participants. Thus, the introduction of non-verbal communication elements was exposed by the facilitator, and the initially planned brainstorming was suppressed), and Conflict management modules (namely, toward the group's interest in the group exercise of conflict management, the time invested in this activity was extended from the initial plan). As a result of these adaptations, fidelity was rated relatively lower for the same modules, particularly the Conscious communication and Conflict management components where the alterations to the initial plan were most impactful. The group responsiveness was good throughout the program, but it was relatively lower in the Personal leadership module compared to the other components. Within Cluster A, robust linear regression models revealed that participants' individual responsiveness ($M=8.19$, $SD=1.37$, $Median=8.67$, 1st quartile=7.08, 3rd quartile=9.25, $Interquartile\ range=2.17$) did not predict the proximal dependent variables at posttest.

Cluster B

The indicators supported the good quality of the intervention's implementation. All the program components were subject to adaptations except for the Personal leadership module, and fidelity was rated relatively lower for the Conscious communication and Conflict management components. Particularly, for this school cluster most adaptations regarded the suppression of the break foreseen in the plan, in order to allow the group's reflections and sharing to be accommodated while ensuring that fidelity was not compromised. However, following the experience of Cluster A, the duration of the activity "Wheel of Feelings" and the group exercise of conflict management required more time than anticipated, thus

impacting the fidelity of the Conscious communication and Conflict management modules. For Cluster B, group responsiveness was excellent and did not vary across the intervention's implementation. Nevertheless, within this cluster, participants' individual responsiveness ($M=8.25$, $SD=1.22$, $Median=8.17$, 1st quartile=7.00, 3rd quartile=9.58, $Interquartile\ range=2.58$) predicted proximal program outcomes for teachers in the EG. The teachers who had attended the A+ and were more responsive in the synchronous sessions reported higher positive affect ($B=0.40$, $SE=0.10$, 95% CI [0.17, 0.63], $R^2=0.44$, $f^2=0.60$), self-regulation ($B=0.24$, $SE=0.09$, 95% CI [0.02, 0.45], $R^2=0.50$, $f^2=0.53$), and responsible decision-making skills ($B=0.17$, $SE=0.07$, $R^2=0.21$, 95% CI [0.01, 0.32], $f^2=0.60$), and lower negative affect ($B=-0.13$, $SE=0.04$, 95% CI [-0.23, -0.04], $R^2=0.68$, $f^2=-0.26$) and expressive suppression ($B=-0.53$, $SE=0.22$, 95% CI [-1.02, -0.04], $R^2=0.54$, $f^2=-0.55$) at posttest.

Cluster C

Within Cluster C, an analysis of the quality of the intervention's implementation parameters showed good indicators. Following the experience of the other training groups, adaptations were relatively higher for the Personal organization and time management, Conscious communication and Conflict management components. The adaptations particularly concerned the adjustment of the duration of the activities with active methodologies, to minimize the impacts on the fidelity of the sessions. Nevertheless, as occurred with the other clusters, fidelity was rated lower for the Conscious communication and Conflict management modules. Within Cluster C, the group was less responsive in the Conscious communication and Personal

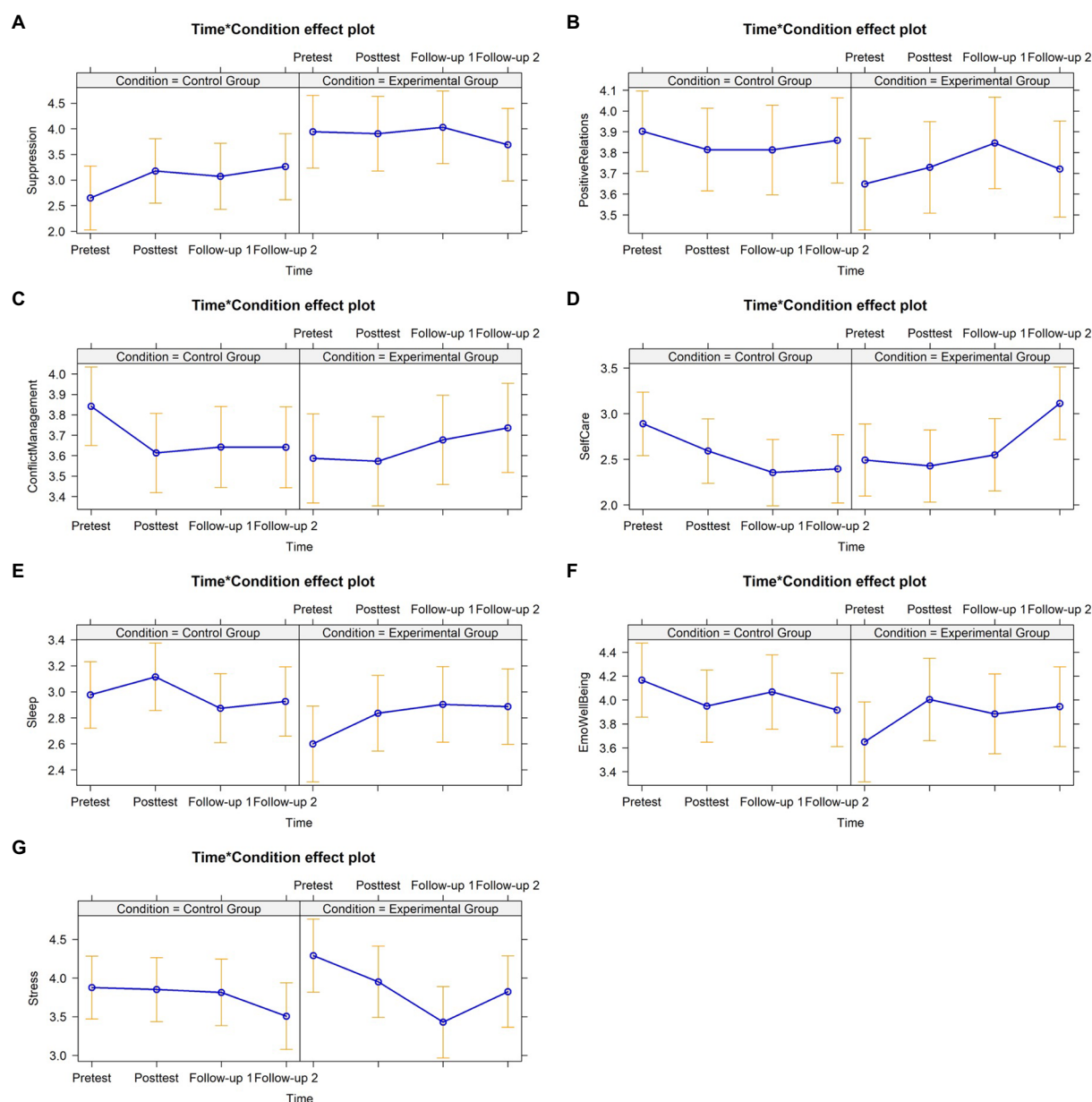


FIGURE 5

Graphical representation of interaction effects (Time*Treatment Condition) on proximal and distal dependent variables – Cluster C. **(A)** Expressive suppression depicting a significant effect at follow-up 2 ($B=-0.93$, $SE=0.38$, 95% $CI [-1.66, -0.19]$, $f^2=-0.69$). **(B)** Positive relationship skills depicting a significant effect at follow-up-1 ($B=0.32$, $SE=0.13$, 95% $CI [0.07, 0.58]$, $f^2=0.74$). **(C)** Conflict management skills depicting a significant effect at posttest ($B=0.21$, $SE=0.11$, 95% $CI [0.03, 0.43]$, $f^2=0.48$), follow-up 1 ($B=0.29$, $SE=0.11$, 95% $CI [0.07, 0.51]$, $f^2=0.65$) and follow-up 2 ($B=0.35$, $SE=0.11$, 95% $CI [0.13, 0.56]$, $f^2=0.78$). **(D)** Self-care practices depicting a significant effect at follow-up 1 ($B=0.59$, $SE=0.24$, 95% $CI [0.13, 1.06]$, $f^2=0.67$) and follow-up 2 ($B=1.12$, $SE=0.24$, 95% $CI [0.64, 1.59]$, $f^2=1.27$). **(E)** Sleep quality depicting a significant effect at follow-up 1 ($B=0.41$, $SE=0.17$, 95% $CI [0.08, 0.74]$, $f^2=0.60$) and follow-up 2 ($B=0.34$, $SE=0.17$, 95% $CI [0.01, 0.67]$, $f^2=0.50$). **(F)** Emotional well-being depicting a significant effect at posttest ($B=0.57$, $SE=0.21$, 95% $CI [0.16, 0.99]$, $f^2=0.78$) and follow-up 2 ($B=0.54$, $SE=0.21$, 95% $CI [0.13, 0.95]$, $f^2=0.74$). **(G)** Occupational stress depicting a significant effect at follow-up 1 ($B=-0.80$, $SE=0.34$, 95% $CI [-1.46, -0.13]$, $f^2=-0.83$).

leadership components, requiring from the facilitator a higher effort to stimulate participants' active participation. Regarding the participants' individual responsiveness ($M=7.88$, $SD=1.41$, $Median=8.00$, 1st quartile = 6.33, 3rd quartile = 9.17, *Interquartile*

range = 2.84), it predicted proximal program outcomes in this intervention group, with the more responsive teachers reporting higher cognitive reappraisal ($B=0.33$, $SE=0.14$, 95% $CI [0.02, 0.64]$, $R^2=0.17$, $f^2=0.49$) at posttest.

TABLE 3 Mean and standard deviation for the dimensions of program implementation quality in accordance with the integrated model of program implementation by Berkel et al. (2011, 2018).

	Facilitator behaviors			Participant behaviors		
	Fidelity	Quality		Group responsiveness		
		Interactive teaching methods	Clinical process	Adaptation	Active participation	Satisfaction Attendance
	<i>M</i> (SD)	<i>M</i> (SD)	<i>M</i> (SD)	<i>M</i> (SD)	<i>M</i> (SD)	<i>M</i> (SD)
<i>Cluster A</i>						
Total	4.88 (0.21)	1.00 (0.00)	4.98 (0.05)	0.25 (0.35)	4.70 (0.42)	4.50 (0.80) 9.08 (1.04)
Personal organization and time management	4.92 (0.14)	1.00 (0.00)	4.94 (0.10)	0.50 (0.50)	5.00 (0.00)	–
Emotional awareness and regulation	5.00 (0.00)	1.00 (0.00)	5.00 (0.00)	0.00 (0.00)	4.50 (0.71)	
Conscious communication	4.75 (0.35)	1.00 (0.00)	5.00 (0.00)	0.25 (0.35)	5.00 (0.00)	
Conflict management	4.50 (0.00)	1.00 (0.00)	5.00 (0.00)	0.50 (0.00)	4.50 (0.00)	
Personal leadership	5.00 (0.00)	1.00 (0.00)	5.00 (0.00)	0.00 (0.00)	4.25 (0.35)	
<i>Cluster B</i>						
Total	4.85 (0.34)	1.00 (0.00)	5.00 (0.00)	0.60 (0.52)	5.00 (0.00)	4.67 (0.78) 9.33 (0.81)
Personal organization and time management	5.00 (0.00)	1.00 (0.00)	5.00 (0.00)	0.67 (0.58)	5.00 (0.00)	–
Emotional awareness and regulation	5.00 (0.00)	1.00 (0.00)	5.00 (0.00)	0.50 (0.71)	5.00 (0.00)	
Conscious communication	4.50 (0.72)	1.00 (0.00)	5.00 (0.00)	1.00 (0.00)	5.00 (0.00)	
Conflict management	4.50 (0.00)	1.00 (0.00)	5.00 (0.00)	1.00 (0.00)	5.00 (0.00)	
Personal leadership	5.00 (0.00)	1.00 (0.00)	5.00 (0.00)	0.00 (0.00)	5.00 (0.00)	
<i>Cluster C</i>						
Total	4.90 (0.21)	1.00 (0.00)	5.00 (0.00)	0.40 (0.52)	4.80 (0.42)	4.81 (0.54) 8.81 (0.87)
Personal organization and time management	5.00 (0.00)	1.00 (0.00)	5.00 (0.00)	0.67 (0.58)	5.00 (0.00)	–
Emotional awareness and regulation	5.00 (0.00)	1.00 (0.00)	5.00 (0.00)	0.00 (0.00)	5.00 (0.00)	
Conscious communication	4.75 (0.35)	1.00 (0.00)	5.00 (0.00)	0.50 (0.71)	4.50 (0.71)	
Conflict management	4.50 (0.00)	1.00 (0.00)	5.00 (0.00)	1.00 (0.00)	5.00 (0.00)	
Personal leadership	5.00 (0.00)	1.00 (0.00)	5.00 (0.00)	0.00 (0.00)	4.50 (0.71)	

Rating scales ranged from: 1 to 5 with regard to the Fidelity, Clinical process, Active participation, and Satisfaction indicators; 0 (i.e., absence) to 1 (i.e., presence) with regards to the Interactive teaching methods and Adaptation indicators; and from 1 to 10 (synchronous sessions) with regard to the Attendance indicator.

Discussion

Summary of the main results

This study aimed to assess the A+ efficacy on teachers' proximal (i.e., SEC) and distal (i.e., self-care practices, sleep quality, well-being, occupational stress, and burnout symptoms) outcomes. Furthermore, adding to the literature in the field, it also sought to assess the role of implementation quality and contextual variables on the program's outcomes. Overall, the findings revealed good indicators of the A+'s efficacy in promoting teachers' resources to respond to previously identified job

demands and increasing occupational health and well-being symptoms. Nevertheless, the results substantially differed across the school-clusters and were not stable across time, thus requiring further reflection.

Findings on intervention's efficacy

In line with prior research (Collie, 2017; Taris et al., 2017), our findings reinforce the importance of considering contextual variables when designing, implementing, and assessing SEL interventions. In this study, organizational climate appeared to predict teachers' SEC which, following previous research, can interfere with teachers' SEL needs (Jennings and Greenberg, 2009;

Collie, 2017). In keeping with prior literature, Cluster B which perceived a healthier organizational climate (namely through the organizational support/democratic leadership and the maintenance of cohesive and strong social relationships with colleagues), also revealed higher protection factors (namely higher means of SEC at baseline). Conversely, clusters A and C which perceived a more closed and unhealthier organizational climate, reported not only lower means of SEC at baseline (across all the assessed variables), but also perceived lower self-care practices, social well-being, and personal accomplishment, and higher occupational stress and emotional exhaustion symptoms, in comparison to Cluster B. Thus, in answer to our research question (Q1), indeed, a positive organizational climate seems to promote teachers' SEC and may, accordingly, impact teachers' perceived SEL needs and professional demands and resources. It seems, therefore, important to take contextual variables into account due to their direct impact on teachers' personal resources to effectively respond to job demands. Moreover, these dissimilarities between working contexts, also seem to interfere with SEL intervention's efficacy.

In this study, mixed results were found regarding the A+'s efficacy which deserve attention. Not only the clusters A and C (which described an unhealthier organizational climate) appear to have benefited more from the intervention program, but also the impacts of the A+ differed between these two contexts. Therefore, it seems necessary to interpret the results considering the specificities of the different contexts, previously depicted in the section "Participants".

With regards to Cluster A, the A+ was particularly effective in promoting teachers' resources associated with emotional regulation (as data suggests an increase in self-regulation skills and use of cognitive reappraisal, and a decrease in the use of expressive suppression). This was, in fact, the dimension in which teachers within this context appear to feel less competent, leading to the experience of negative emotions and related symptoms (such as, emotional exhaustion). Interestingly, not only did the emotion regulation skills appear to change the most post-intervention but, additionally, the EG teachers also reported a decrease in negative affect and emotional exhaustion symptoms. Therefore, regarding Cluster A, hypotheses 1 and 2b were partially sustained, while hypothesis 2a was not confirmed.

Concerning Cluster B, the A+ seems to have not been effective in promoting teachers' SEC nor their occupational health. Moreover, within this cluster, the results indicated an unexpected increase of negative affect for the teachers who had benefited from the intervention, at posttest. However, even though emotional regulation skills emerged as the main challenge for these teachers at the needs assessment, this was, of the three, the school cluster which described fewer needs/risk factors. Moreover, the findings suggested that: not only there were no significant differences in the baseline level of SEC between school clusters, but there was also a tendency for teachers from Cluster B to present higher mean scores towards these skills. Thus, as far as

Cluster B is concerned, there are different explanatory hypotheses that may have been at the origin of these results. On one hand, it is possible that a ceiling effect has occurred in view of which the contents of the intervention were not effective in further contributing to the development of these teachers' SEC. Also, in view of these findings, it is possible that teachers in Cluster B did not perceive a need for behavioral change given their low perception of risk factors (Schwarzer, 2016). Furthermore, the apparently perverse increase in teachers' negative affect at posttest (which was not maintained across time) can also relate to the very positive perception of these teachers' working context. More specifically, as aforementioned (*vide* section "Participants"), this school-cluster is characterized by strong interpersonal relations. Therefore, this result may be reflecting teachers' resistance to change, possibly driven by the uncertainty of how these new behaviors would be received by their peers. Following the *Self-determination theory* (Deci and Ryan, 1985), human behavior is motivated by relatedness, which regards to the feeling of being close to others/significant part of a social group. Also, in accordance with the *Theory of planned behavior* (Ajzen, 2005) an intention to behave depends on the individuals' subjective norms (i.e., the belief on how a behavior would be approved/disapproved by the group). Thus, as teachers from the Cluster B valued the interpersonal relations with their colleagues, assessed their work environment to be positive and presented fewer demands, group allegiance and outcome expectancies toward behavior change may have affected the results. Still, it should not be disregarded that participating in this intervention program may have increased teachers' workload (namely since at posttest, teachers from the EG were completing assignments to conclude their certification, whilst teachers from the CG did not have this additional task) thus interfering with teachers' affect and stress at posttest (Granziera et al., 2021). Therefore, regarding Cluster B, none of the hypotheses were confirmed.

Finally, for Cluster C, the A+ seems to have been particularly effective in promoting teachers' positive relationship and conflict management skills, and in decreasing teachers' use of expressive suppression. As described in the participants' characterization, this was the context that presented the most personal risk factors (particularly related to interpersonal relationship and emotional regulation), leading to demotivation and negative emotions. Hence, findings suggest that the A+ was effective in increasing teachers' resources in the dimensions where teachers perceived to have greater needs. Moreover, following the *Theory of planned behavior* (Ajzen, 2005), we know that subjective norms are important to determine individual's behavioral intentions. Also, in this school cluster, social support between peers emerged as the most valued resource. Then, relatedness is important for these teachers (Deci and Ryan, 1985). However, contrary to what was observed for Cluster B, in this school cluster there was a high identification of professional demands both at a personal and at the working context levels. Thus, the perceived need for behavioral change would be higher for this group (Schwarzer, 2016). Additionally, as the intervention groups were built within the

same school cluster to facilitate the identification and resolution of specific problems within the context, it is possible that this group connection has contributed to the faster and more permanent development of interpersonal skills (i.e., positive relationship and conflict management skills) in these teachers. With teachers feeling an increase in the resources perceived to be lacking, the results obtained in the distal variables (i.e., self-care practices, sleep quality, well-being, and reduced stress) are in line with what is expected and suggested by the literature (Jennings et al., 2013, 2017, 2019; Harris et al., 2016; Oliveira et al., 2021a). Therefore, regarding Cluster C all three hypotheses were partially sustained.

Taken together, these findings suggest that the intervention was effective in addressing the main needs identified by teachers within the different school clusters. However, the findings also point to sleeper effects found in SEC (with most effects emerging only in follow-up 1 and follow-up 2) and the fragile stability of the proximal and distal results across time and within the different school clusters. This suggests the possible need to increase the duration of the intervention program and/or to develop complementary booster sessions. In line with prior literature, duration (i.e., distance between the 1st and last training sessions) above dosage (i.e., number of effective training hours) appears to impact program outcomes (Oliveira et al., 2021b). Furthermore, particularly because self-report measures were used in the present study, which entail a change in the perception of behaviors, the findings may be more sensitive to the participant's perception and, therefore, require more time to reflect changes. As teachers already automatized behavior patterns regarding social and emotional skills (even those that are ineffective and unhealthy, e.g., regulating emotions through expressive suppression), they might require a longer period to experiment new behaviors, evaluate the results, (re)adapt or maintain the change. In accordance with the *Health Action Process Approach* framework, behavior change, particularly when related to crystallized behaviors, is demanding and requires several factors in addition to the intention to change (e.g., risk perception; action, maintenance and recovery self-efficacy; outcome expectancies; action control) (Schwarzer, 2016), thus requiring time for the changes to be expressed in the self-report questionnaires.

Additionally, most of the interaction effects found resulted from not only gains in the EG in the expected direction, but also CG reductions in perceived SEC, self-care practices, sleep quality, and well-being, and the enhancement of burnout symptoms. Also, the majority of interaction effects were found at follow-up 1 and 2, which coincided with the third wave of the SARS-CoV-2 pandemic in Portugal which led to the closure of schools again (follow-up 1) and the end of the school year (follow-up 2). Considering that teachers' job demands and distress normally increase throughout the school year (e.g., von der Embse and Mankin, 2021), and that during this year these demands were exacerbated by the new waves of SARS-CoV-2, these results suggest that the A+ may have contributed to a greater stability of SEC over time in the EG teachers and helped

them to navigate across periods of greater uncertainty and adaptation.

Although the study hypotheses were not fully confirmed, the findings present promising preliminary evidence which may contribute to both research and practice in this field. Taken together, the findings of this study contribute to the knowledge on the potential of SEL interventions specifically designed for teachers. Particularly for cases where teachers perceive fewer personal resources and a more demanding working context, findings support that SEL interventions as the A+ may offer an important contribution to the development of teachers' personal resources to mitigate the negative impacts of job demands on their occupational health and well-being. Results also add to the current knowledge by emphasizing the importance of organizational climate on teachers' SEC.

Findings on quality of the intervention implementation

As far as quality of intervention implementation is concerned and addressing our second research question (Q2), the findings indicate high levels of both facilitator and participants' behaviors, across the three intervention groups. Moreover, no statistically significant differences were found with regards to the intervention implementation between the training groups. This is an important finding since, as previous literature depicts, the quality of the intervention implementation can affect and bias the intervention's efficacy (Berkel et al., 2011, 2018; Humphrey et al., 2018). Then, particularly considering the mixed results found towards the A+'s efficacy, this is an important result since it allows to support the explanatory hypothesis that mixed results originate from between-context variability and not due to differences in the quality of the intervention.

Furthermore, our findings are in line with recent research that highlights the impact of participants' responsiveness on the intervention's outcomes (Berkel et al., 2018; Humphrey et al., 2018). When we look further into the participants' responsiveness within each group, the results suggest that the active participation and engagement of the participants influenced the results within each EG. More specifically, Cluster A, where participants' responsiveness did not seem to directly relate with their SEC development, was the context that showed the lowest group responsiveness (compared to Clusters B and C) and lowest within-group variability (*Interquartile range* = 2.17). Cluster B, on the other hand, showed the highest and most consistent group responsiveness (both active participation and attendance) throughout the intervention. And, along with Cluster C, presented a higher within-group variability (*Interquartile range* = 2.58), against Cluster A. This higher responsiveness appears to have made an important contribution to the perception of a greater development of SEC, particularly intrapersonal competence (i.e., self-awareness and self-regulation). Taken together, these results are in line with Berkel et al.'s (2011, 2018) model and contribute to the discussion on the importance of implementation quality research as a component of program

planning with a view to enhancing and better understand programs' efficacy.

Limitations and future research

Despite its promising results, the present study also has limitations that warrant mention. A small, self-selected and geographically circumscribed sample was used which, adding to the role of the contextual variables, limits the generalization of the findings. However, to explore and comprehend the impact of the organizational climate on the teachers' SEC was one of our main goals. And, as sustained by our results, the contextual variables predicted teachers' SEC, and the school clusters that integrated this study presented significant differences between these contextual variables. Thus, we had to consider the different school clusters separately, notwithstanding the reduced sample size within each cluster. Nonetheless, within the three school-clusters assessed, after excluding teachers who did not comply with the eligibility criteria, and ensuring voluntary participation, we had a participants' enrollment rate of 71.68%. The attrition rate is reasonable given how demanding the study was (i.e., investment in the 50 h of training, several moments of data collection, and participation during an entire school year). We have also chosen the data analysis procedures (i.e., use of robust statistics, account for family-wise error rate) seeking to minimize the impacts of this limitation. Taken together, in this study, to consider a small and geographically circumscribed sample was the best compromise to meet our goals. However, it calls for future studies to further validate the A+ efficacy in different educational contexts, accounting for the necessary adaptations, and considering larger and more diverse samples. Still regarding our sample, the A+ was developed for elementary-school teachers. However, given the scarcity of SEL interventions for teachers, it would be important for future studies to understand the suitability of A+ to other groups of teachers (i.e., middle and high school, tertiary teachers). Also, with a larger sample, it would be interesting to test the mediation effects of the proximal variables on the distal variables to enable a better understanding of the relationship between the assessed outcomes, as well as the spillover effects to students' SEC, well-being, and academic performance suggested by previous studies (Jennings and Greenberg, 2009; Carvalho et al., 2021).

On the other hand, only self-report measures were used to assess the intervention's efficacy. Even though this was a means to ensure all data collection waves and reduce attrition due to the limitations caused by the SARS-CoV-2 pandemic, they are also more susceptible to SDB (Larson, 2019). A second issue with the use of self-report measures is the risk of a more conservative evaluation of one's own competencies and symptoms, after gaining a more accurate perception of the variables under assessment. To account for this limitation, we have selected instruments previously studied with Portuguese samples, guaranteed anonymity and confidentiality of the responses, and included a statement encouraging honesty at the beginning of the data

collection protocol (Larson, 2019). We have also included measures with different rating-scales and items with a reverse response direction to minimize the risk of acquiescent response bias (Ratnayake and Jones, 2007). Nevertheless, it is important for future research to use complementary data collection methods, such as behavioral and objective measures (e.g., situational judgment tests; Aldrup et al., 2020), to strengthen the evidence on the A+ efficacy.

The use of an online intervention also bears constraints which could interfere with the program's efficacy. Notwithstanding, having ensured learner-instructor interaction and connectedness, feedback opportunities and synchronous guidance, as well as user-friendly tools, which have been associated with high levels of user satisfaction and learning outcomes by prior research (Hofmann, 2014; Beatty and Binnion, 2016; Kintu et al., 2017), other aspects such as technological limitations and individual skills such as digital literacy may have still influenced the participants' engagement in the program and outcomes (Hofmann, 2014; Kintu et al., 2017). Thus, when a period of greater stability is reached and the SARS-CoV-2 restrictions are lifted, thus allowing full access to the respective contexts, it would be important to test the A+ efficacy in a face-to-face and/or blended learning format.

The fact that the participants were not blinded was also a limitation. The teachers may have raised their expectations of changes in the school by knowing that an intervention was occurring and, if those expected changes were not perceived to be met, worse evaluations can be made across time regarding the distal outcomes, namely in terms of well-being, stress, and burnout. Also, contamination across the treatment conditions cannot be overlooked since this study was performed in a real context in which the participants have relations with each other. Although this is a difficult constraint to overcome since, given the key role of context, it is important that teachers in the EG and CG belong to the same school cluster, future studies should try to account for this limitation. Lastly, regarding the treatment conditions, the use of a waitlist control group instead of an active control group can increase bias in the results. Voluntary participation could also lead to bias since teachers are already more available and aware of this issue. Thus, it is important for future research to resort to active comparison groups.

Study impact

Despite the aforementioned limitations, this study advances important contributions to both research and practice. The findings provided promising indicators of the efficacy of the A+ intervention program, a theoretically and empirically grounded online SEL intervention for teachers, particularly when considering the needs and characteristics of each intervention context. Results also explored the impact of quality of implementation. Taken together this study's results contribute to filling the gap in the prior literature on SEL interventions for teachers (Oliveira et al., 2021a).

By presenting a between-subjects longitudinal design with four data collection waves across a school year and resorting to hierarchical models to test interaction effects, this study contributes to more methodologically robust research regarding SEL interventions for teachers (Oliveira et al., 2021a). By sustaining the predictive value of organizational climate dimensions on teachers' SEC, our results also corroborate previous studies which stress the prominent impact of contextual variables on teachers' personal and professional outcomes (namely, SEC development and occupational health; Schaufeli and Taris, 2014; Collie, 2017). In our study, most of the organizational climate dimensions assessed predicted at least one dimension of teachers' SEC (both at an intrapersonal and interpersonal level) at baseline. Thus, our findings reinforce the interaction between personal-level and organizational-level demands and resources (Granziera et al., 2021). Consequently, they also highlight the need to consider teachers' occupational health and well-being as being multidimensionally impacted (i.e., intra-, inter-personally and organizationally) when designing and assessing policies and interventions to mitigate teachers' ill-health (Schaufeli and Taris, 2014; Collie, 2017; Taris et al., 2017; Ford et al., 2019). Taken together, these results support and highlight the importance of adopting a systemic approach in interventions aimed at promoting teachers' occupational health. As the findings strengthen the important role of schools' environment and educational systems for teachers' occupational health and well-being, then it is understandable that teachers cannot be solely held accountable (Granziera et al., 2021). Similarly to what literature has highlighted for other professions with a high prevalence of burnout (e.g., physicians; Jha et al., 2018), it is essential to look at teachers' occupational health and burnout as a socio-professional problem that requires intervention directed, complementarily, at both individual and contextual/organizational level dimensions. Consequently, there is need for SEL interventions to adopt a whole-school approach involving all the school personnel (Durlak et al., 2015; Collie, 2020).

Moreover, by using independent observational data grounded in Berkel et al.'s (2011, 2018) model, this study also contributes to further exploring the relationship between SEL interventions' quality of implementation and efficacy. When assessing quality of implementation, prior studies have mostly focused on the impact of fidelity on program outcomes (Oliveira et al., 2021a). However, recent research has brought a new perspective to the table where, above facilitator behaviors (the main impact of which appears to be on participants' responsiveness), program outcomes are directly impacted by participants' responsiveness (Berkel et al., 2018; Humphrey et al., 2018). Although preliminary, our findings (in which the participants' active participation and engagement seems to have influenced the outcomes on EG teachers' SEC development) align with this study and sustain the importance of participants' responsiveness.

Additionally, this study makes available a theoretically grounded, valid, and culturally adapted intervention, which is

specific to teachers' needs and allows teachers to see direct personal and professional benefits (Granziera et al., 2021). By effectively promoting teachers' personal resources (e.g., self-regulation, positive relations and conflict management skills) to face job demands, the A+ can be a useful resource to help break the "vicious circle" of teachers' burnout symptoms (e.g., increasing well-being and decreasing emotional exhaustion symptoms; Guthrie et al., 2020; Bianchi et al., 2021). Moreover, by presenting good indicators of efficacy across time (and in a particularly demanding period), this intervention can also contribute to reducing costs (temporal and financial) in educational contexts by being able to provide teachers with effective resources to manage personal and professional challenges over time. Furthermore, considering the instability experienced during the SARS-CoV-2 pandemic, online interventions such as the A+ may become a flexible and refined tool to promote teachers' occupational health and well-being. This online format enables the adaptation and continuity of the interventions even in situations where the participants are isolated or in new lockdowns, thus continuing to support teachers in moments of transition/greater demand and instability. As previously mentioned, there may have been a ceiling effect impacting intervention's efficacy at Cluster B. If true, this result signals the importance to do not develop only universal interventions, as it was the case of the A+ intervention. Thus, it is important that researchers and practitioners develop and assess the impacts of multi-tiered interventions (Oliveira et al., 2021a), for example that follows a targeted universalism approach in which differentiated adaptations are needed to attain the desired outcomes (e.g., Powell et al., 2019). Lastly, the longitudinal analysis revealed sleeper effects (e.g., for both Cluster A and C, emotional regulation skills of the EG only increase significantly from follow-up 1) and fragile stability (with fluctuations in the outcome variables, e.g., in Cluster C, teachers from the EG describe a significant decrease in their occupational stress at follow-up 1 that regresses at follow-up 2) of the A+ impacts across the data collection waves, thus reinforcing the importance of developing SEL interventions which are embodied in the school-contexts to allow for regular monitorization, skillful feedback and booster sessions.

Data availability statement

The datasets generated for this study and the codebooks which underlie the analyses can be found in the Open Science Framework repository: <https://doi.org/10.17605/OSF.IO/2KZGW>.

Ethics statement

The studies involving human participants were reviewed and approved by Scientific and Ethical Council of the Faculty of

Psychology, University of Lisbon. The patients/participants provided their written informed consent to participate in this study.

Author contributions

SO designed and executed the study, analyzed the data, and wrote, edited, and revised the manuscript. MR assisted with the design of the study and the data analyses, and collaborated with the writing and the editing of the final manuscript. AV-S assisted with the design and execution of the study, and the editing of the final manuscript. AM-P assisted with the design, execution, and theoretical grounding of the study, and collaborated with the writing and the editing of the final manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpsyg.2022.957249/full#supplementary-material>

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International students' study-related burnout: Associations with perceptions of the teaching-learning environment and approaches to learning

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International students study in new, unfamiliar teaching-learning environments (TLEs) and may thus experience study-related burnout. However, little research exists on the relationship between perceptions of the TLE and such burnout, especially among international students. Nevertheless, one key factor is thought to be students' approaches to learning. This study investigated the relationship between international students' perceptions of the TLE, approaches to learning and study-related burnout and how these approaches mediate the relationship between perceptions of the TLE and burnout. The data were collected among international students ($n=162$) in a research-intensive Scandinavian university and analyzed using confirmatory factor analyses and structural equation modelling. The results indicated that international students' study-related burnout correlated negatively with perceptions of the TLE (alignment, interest and relevance, constructive feedback and peer support). Their study-related burnout was positively related to the unreflective approach to learning and negatively related to the deep approach to learning and organized studying. The study proved that approaches to learning acted as mediators between perceptions of the TLE and study-related burnout. The findings indicated that how the dimensions of study-related burnout were affected by different constructs of perceptions of the TLE and approaches to learning among international students. Based on these findings, the study provides implications for improving teaching. Future research should focus on the relationship between the deep approach to learning and exhaustion and how peer support affects study-related burnout.

KEYWORDS

study-related burnout, teaching-learning environment, approaches to learning, higher education, international students

Introduction

International students come to study in a new, unfamiliar teaching-learning environment (TLE) (Jin and Schneider, 2019; Smith et al., 2022). Though this environment might superficially resemble that of their domestic institution due to mobility programs, credit transfer and the internationalization of curriculums (Beerens et al., 2016), there can still be differences in how teaching and learning are organized (Lin and Scherz, 2014; Jin and Schneider, 2019). Consequently, international students must learn how to learn in the new TLE. While international students possess their own study experience from their home countries and have developed strategies that may be successful or suitable in that context (Sakurai et al., 2016; Sakurai, 2021; Smith et al., 2022), in the host institutions, they must adjust their learning processes and attempt to adapt them to the requirements and characteristics of the new TLE (Lin and Scherz, 2014; Tian et al., 2021).

International students may experience burnout in their studies (Jin et al., 2021). International students' stress has found to be related to their experiences of the TLE (Sakurai et al., 2016; Mitchell et al., 2017) and burnout (Lin and Huang, 2014). Though research focuses on international students' perceptions of the TLE (Sakurai et al., 2016) and well-being (Jin et al., 2021), the relationship between perceptions of the TLE and study-related burnout has not been examined in these studies among international students, especially in Finnish context. Perceptions of the TLE have found to be related to study-related burnout among non-international students (Dyrbye et al., 2009; Meriläinen, 2014; Asikainen et al., 2022). Nevertheless, the constructs of perceptions of the TLE have been developed in recent years.

Furthermore, few research has examined what mediates the relationship between perceptions of the TLE and study-related burnout (Meriläinen, 2014). Student's approaches to learning have been shown to be related both to perceptions of the TLE (Asikainen et al., 2014; Postareff et al., 2018) and to study-related burnout (Asikainen et al., 2019). Approaches to learning have also been shown to act as mediators between the TLE and learning outcomes (Lizzio et al., 2002; Rytönen et al., 2012). Thus, the present study aims to explore the relationship between international students' perceptions of the TLE, approaches to learning and study-related burnout and to test how approaches to learning could act as mediators between perceptions of the TLE and such burnout. The research questions are as follows (see the hypothetical model in Figure 1):

1. How are perceptions of the TLE related to approaches to learning and study-related burnout among international students?
2. How are approaches to learning related to study-related burnout among international students?
3. How do approaches to learning mediate the relationship between perceptions of the TLE and study-related burnout?

Students' study-related burnout

Study-related burnout in higher education, or academic burnout, has been distinguished from general burnout (Maslach et al., 1996; Asikainen et al., 2022). It has been explored with its own scales which have been adapted among students (Schaufeli et al., 2002; Hernesniemi et al., 2017). Study-related burnout refers to the psychological syndrome consisting of study-related exhaustion, cynicism and a sense of inadequacy (Schaufeli et al., 2002; Salmela-Aro et al., 2009; Salmela-Aro and Read, 2017). Study-related exhaustion involves chronic fatigue, tiredness and a lack of emotional energy (Salmela-Aro et al., 2009). Cynicism, in turn, is defined as a loss of interest in and indifference to studying and a sense of its meaninglessness (Salmela-Aro et al., 2009). Finally, a sense of inadequacy, also termed inefficacy, refers to 'diminished feelings of competence', and a lack of a sense of accomplishment and achievement (Salmela-Aro et al., 2009, p. 48). Study-related burnout develops when students feel that they fail to meet the study requirements and are unable to adapt themselves to those requirements despite their best efforts (Salmela-Aro and Read, 2017; Asikainen et al., 2022). Nevertheless, little research exists on how international students experience study-related burnout and how such burnout is affected by their adaptation to the new context.

Students' perceptions of the teaching-learning environment

According to theory and recent research among non-international students in different contexts, perceptions of the teaching-learning environment have been classified as the following constructs: alignment, interest and relevance, constructive feedback and peer support (Parpala and Lindblom-Ylänne, 2012; Asikainen et al., 2014). Alignment emphasizes that the aims of teaching are constructively in line with the content, process and assessment methods (Entwistle et al., 2002; Hailikari et al., 2021). Interest and relevance, also termed relevance and evoking interest, focuses on students' interests in the learning content and participation in the courses, and how students perceive the relevance of the learning content (Entwistle et al., 2002; Parpala and Lindblom-Ylänne, 2012). Constructive feedback emphasizes the sufficiency of the feedback provided on students' work and the benefits that such feedback produces, such as allowing students to form connections with their existing knowledge, removing ambiguity and improving their ways of learning and studying (Entwistle et al., 2002; Parpala and Lindblom-Ylänne, 2012). Peer support, also referred to as support from other students, focuses on the accessibility, usefulness and emotional characteristics of such assistance (Entwistle et al., 2002; Parpala and Lindblom-Ylänne, 2012).

International undergraduate students generally have positive perceptions of feedback both before and after assessment

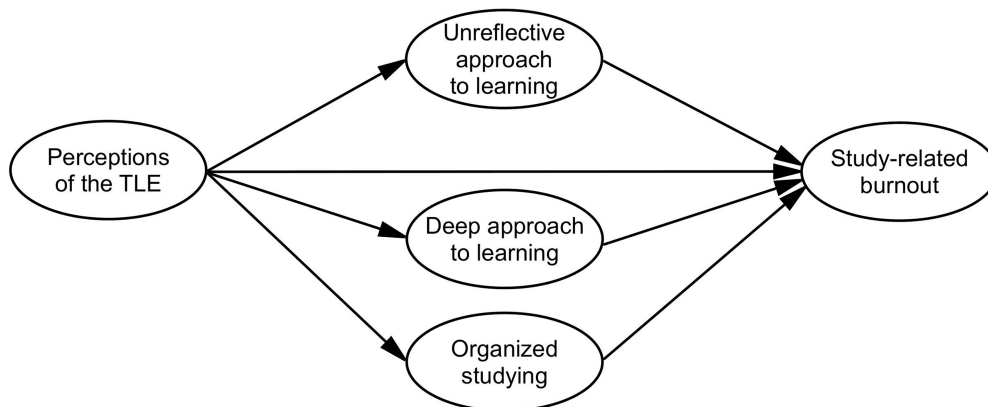


FIGURE 1

Hypothetical model of the interrelations between perceptions of the TLE, approaches to learning and perceived study-related burnout.

submission (Henderson et al., 2021). When dealing with academic challenges, international students ask teachers for help and value their feedback (Lin and Scherz, 2014). Moreover, peer support helps international students achieve better engagement (Mitchell et al., 2017) and it affects well-being and burnout particularly among non-international students (Lin and Huang, 2012; Räisänen et al., 2020).

Students' approaches to learning

Approaches to learning concern students' intentions and learning processes during their studies (Entwistle and Ramsden, 1983; Gijbels et al., 2005). Research has identified three approaches to learning among non-international university students: the surface approach to learning, the deep approach to learning, and organized studying (Marton and Säljö, 1976; Entwistle, 2009; Lindblom-Ylänne et al., 2019; Parpala et al., 2021a). The same three approaches to learning have been found among international students in Finland (Sakurai et al., 2014, 2016). Recent research highlights that the surface approach to learning should be labelled an unreflective approach to learning, as it is founded on a fragmented knowledge base and a lack of reflection (Lindblom-Ylänne et al., 2019). The deep approach to learning, by contrast, entails using evidence and integrating new information with previous knowledge (Entwistle, 2009). Organized studying, in turn, refers to students' ability to time and effort management (Entwistle, 2009).

Relationship between students' perceptions of the teaching-learning environment, study-related burnout and approaches to learning

The relationships between students' perceptions of the TLE, their approaches to learning and study-related burnout have not

been examined among international students. Moreover, while studies among non-international students have focused on these relationships separately (Tackett et al., 2017; Postareff et al., 2018; Asikainen et al., 2019; Henderson et al., 2021), there is lack of research that takes all these aspects into account. Among non-international students, the unreflective approach to learning has proven to be negatively related to perceptions of the TLE (Herrmann et al., 2017). The deep approach to learning and organized studying have proven to be positively related to perceptions the TLE among non-international students (Lizzio et al., 2002; Herrmann et al., 2017) and international students (Sakurai et al., 2016). Some constructs of perceptions of the TLE, e.g., interest and relevance, have proven to be negatively related to study-related burnout among non-international students (Asikainen et al., 2022). Moreover, a decrease in students' satisfaction with constructive feedback and the support provided by peers explains an increased risk of study-related burnout (Dyrbye et al., 2009). Approaches to learning have also proven to be associated with study-related burnout among non-international students (Asikainen et al., 2019). For example, the surface approach to learning has been found to be positively associated with burnout (McManus et al., 2004; Asikainen et al., 2019; Hu and Yeo, 2020). Conversely, the deep approach to learning and organized studying have shown to be negatively related to burnout (McManus et al., 2004; Asikainen et al., 2019; Hu and Yeo, 2020).

Research has found that some factors (e.g., achievement motivation and proper workload) act as mediators between perceptions of the TLE and study-related burnout (Meriläinen, 2014). Furthermore, approaches to learning have proven to act as mediators between perceptions of the TLE and learning outcomes such as examination grades (Lizzio et al., 2002; Diseth et al., 2006, 2010; Rytkönen et al., 2012). In light of these previous studies, when exploring the relationship between perceptions of the TLE and study-related burnout, the mediating effects of approaches to learning should be taken into account.

Materials and methods

Research context

In 2018, 12% of first-time graduates at master's or equivalent levels in Finland were international students (*cf.* an average of 19% in OECD countries; OECD, 2020). At the research-intensive Finnish university where the study was conducted, the total proportion of international students was 14.5%. In 2018, 1,150 bachelor and master's students whose nationality was not Finnish were registered on the Student Register database. At that time, this university offered 37 bachelor (180 ECTS, 3 years) and 65 master's programs (120 ECTS, 2 years). The Faculties of Agriculture and Forestry, Arts, Educational Sciences, Biosciences, Science, and Social Sciences offered more programs than did the Faculties of Law, Pharmacy, Theology, and Medicine. Before the first bachelor program was taught fully in English in autumn 2019, all bachelor programs had been taught in Finnish or Swedish. By contrast, the main language of instruction of master's programs had been English (90.1% in the present study).

Participants

A total of 162 international students from 10 faculties participated in the study in 2018 and 2019. Students were informed about the purpose of the study and participated voluntarily. The distribution of participants was in line with that of registered international students in the university; more information about gender, student status, and faculties is displayed in Table 1. The age of the participants ranged from 19 to 47 years ($M = 26$, $SD = 5.2$), and more than two thirds of them were female. The participants came from 46 countries and thus represented diverse cultural and educational backgrounds.

Measures

The data concerning approaches to learning and experiences of the TLE were collected using the HowULearn Questionnaire (in English). The HowULearn questionnaire (Parpala and Lindblom-Ylänne, 2012) has been validated in Finnish and other cultural contexts (Rytönen et al., 2012; Cheung et al., 2020; Parpala et al., 2021b). Students responded to all items on a five-point scale from 1 (completely disagree) to 5 (fully agree).

Perceptions of the TLE were measured by 14 items originating from the Experiences of Teaching and Learning Questionnaire (ETLQ; Entwistle et al., 2003; Parpala et al., 2013). The following four dimensions have proven to be robust in previous research (Herrmann et al., 2017) and were used in the present study: alignment (4 items), interest and relevance (3 items), constructive feedback (3 items), and peer support (4 items).

On the items measuring approaches to learning, students described their study practices regarding their programs as a whole

TABLE 1 Participant demographics.

		No. of students	%	University register office (%)
Gender	Female	113	69.8	59.4
	Male	48	29.6	40.6
	Unknown	1	0.6	
Student status	Degree-seeking	8	4.9	20.3
	Bachelor			
	Degree-seeking	78	48.1	57.6
	Master			
	Visiting	36	22.2	22.1
Faculty	Bachelor			
	Visiting Master	40	24.7	
	Arts, humanities, and social sciences	89	54.9	51.3
	Sciences	73	45.1	48.7
Year of study	1st	83	51.1	
	2nd	38	23.5	
	3rd	19	11.7	
	4th or more	16	9.9	
	unknown	6	3.7	
Country of origin	Europe	89	54.9	
	Asia	31	19.1	
	North America	17	10.5	
	Africa	5	3.1	
	South America	4	2.5	
	Oceania	3	1.9	
	Dual nationality	5	3.1	
	Unknown	8	4.9	

(Entwistle et al., 2002; Parpala and Lindblom-Ylänne, 2012). The subscales consisted of the unreflective approach to learning (4 items), the deep approach to learning (4 items) and organized studying (4 items; Parpala and Lindblom-Ylänne, 2012).

Study-related burnout was measured by a modified version of the School Burnout Inventory (SBI; Salmela-Aro et al., 2009), which has been validated in the Finnish context (Räsänen et al., 2020). These items were classified as exhaustion (3 items), cynicism (4 items) and a sense of inadequacy (2 items) (Salmela-Aro et al., 2009).

The last section, regarding background information, included gender, age, faculty, student status and length of study.

Data analyses

Confirmatory factor analysis was performed using SPSS 27 to examine the factors related to perceptions of the TLE, approaches to learning, and study-related burnout. One item on the unreflective approach to learning ('Often I have to repeat things in order to learn them') was deleted. This was because the

TABLE 2 Reliability, descriptive statistics, and correlations.

Factors	1	2	3	4	5	6	7	8	9	10
1. Alignment										
2. Interest and relevance	0.62**									
3. Constructive feedback	0.69**	0.48**								
4. Peer support	0.35**	0.45**	0.37**							
5. Unreflective approach to learning	−0.35**	−0.42**	−0.24**	−0.18*						
6. Deep approach to learning	0.32**	0.47**	0.27**	0.44**	−0.49**					
7. Organized studying	0.29**	0.27**	0.23**	0.29**	−0.30**	0.41**				
8. Exhaustion	−0.31**	−0.23**	−0.34**	−0.18*	0.37**	−0.13	−0.11			
9. Cynicism	−0.45**	−0.52**	−0.39**	−0.20*	0.45**	−0.29**	−0.31**	0.56**		
10. Sense of inadequacy	−0.24**	−0.27**	−0.28**	−0.17*	0.56**	−0.27**	−0.21**	0.65**	0.50**	
M	3.58	3.91	3.45	3.94	2.14	4.07	3.56	2.50	2.44	2.66
SD	0.76	0.74	0.85	0.78	0.79	0.59	0.85	1.08	1.12	0.97
Cronbach's α	0.81	0.72	0.83	0.67	0.74	0.74	0.80	0.74	0.88	0.66

* $p < 0.05$, ** $p < 0.01$.

estimate of standardized regression weights was low (0.13), and removing the item contributed to an improvement of 10 in Cronbach's α . Reliability coefficient alphas were all sufficient, ranging between .66 and .88 (see Table 2). The results of the approaches to learning and study-related burnout exhibited a reasonable fit ($df = 41$, $\chi^2 = 61.726$, $p = 0.020$, GFI = 0.937, CFI = 0.962, TLI = 0.949, RMSEA = 0.056, SRMR = 0.058 and $df = 24$, $\chi^2 = 46.777$, $p = 0.004$, GFI = 0.860, CFI = 0.967, TLI = 0.951, RMSEA = 0.077, SRMR = 0.056 respectively). By contrast, the results of perceptions of the TLE exhibited a poor model fit ($df = 71$, $\chi^2 = 223.741$, $p < 0.001$, GFI = 0.846, CFI = 0.847, TLI = 0.804, RMSEA = 0.116, SRMR = 0.080), which supports the choice of exploring them separately in most previous studies.

Then t-test was conducted to explore the differences in gender, faculties (science or other, i.e., arts, humanities and social sciences) or length of study (1 year or more). No statistically significant differences were found. Bivariate correlation analysis was performed to examine the relationship between those variables. Structural equation modeling with maximum likelihood was employed to test the hypothetical model (see Figure 1) using SPSS AMOS 27. The fit of the model examining study-related burnout as a whole was unsatisfactory. Therefore, we report the models measuring study-related burnout separately as exhaustion, cynicism and a sense of inadequacy.

Results

Perceptions of the TLE in relation to approaches to learning and study-related burnout

For the first research question, the results showed that correlations between perceptions of the TLE and the approach to learning were statistically significant and also in the expected directions (see Table 2). International students' perceptions of the

TLE correlated negatively, to a statistically significant degree, with the unreflective approach to learning. In turn, they were statistically significantly and positively related to the deep approach to learning and organized studying.

Moreover, perceptions of the TLE were found to correlate negatively, to a statistically significant degree, with study-related burnout. However, the correlation was slightly weaker for the relationship between perceptions of the TLE and a sense of inadequacy than for the relationship between perceptions of the TLE and exhaustion or cynicism. In addition, peer support was less strongly related to study-related burnout than were other perceptions of the TLE.

Approaches to learning in relation to study-related burnout

For the second research question, the results showed that international students' unreflective approach to learning correlated positively with exhaustion, cynicism, and a sense of inadequacy (see Table 2). Conversely, the deep approach to learning displayed significant negative correlations with cynicism and a sense of inadequacy, as did organized studying.

Nevertheless, the deep approach to learning and organized studying failed to display statistically significant correlations with exhaustion. This indicates that exploring study-related burnout separately in the structural model might reveal more details about how approaches to learning mediate the relationship between perceptions of the TLE and study-related burnout.

Approaches to learning mediating the relationship between perceptions of the TLE and study-related burnout

The model of perceptions of the TLE, approaches to learning, and exhaustion ($df = 161$, $\chi^2 = 295.905$, $p < 0.001$, GFI = 0.847,

AGFI = 0.800, CFI = 0.881, TLI = 0.860, RMSEA = 0.072, SRMR = 0.079; see Figure 2) confirmed that interest and relevance correlated with the unreflective approach to learning negatively and statistically significantly. Moreover, a positive, statistically significant correlation was found between peer support and the deep approach to learning. The standardized direct effect of constructive feedback on exhaustion was negative and different to a statistically significant degree. The model confirmed that the standardized direct effect of the unreflective approach to learning on exhaustion was positive and statistically significant. However, the deep approach to learning correlated positively with exhaustion, which was not in line with the hypothetical model or the bivariate correlation results. In addition, the model confirmed that the unreflective approach to learning mediated the relationship between interest and relevance and exhaustion. The standardized indirect (mediated) effect of interest and relevance on exhaustion was -0.274 ($p < 0.001$). That is, due to the mediated effect of interest and relevance on exhaustion, when interest and

relevance increased by 1 standard deviation, exhaustion decreased by .274 standard deviations. Meanwhile, the mediated effect of peer support on exhaustion was positive but not statistically significant ($\beta = 0.187$, $p = 0.079$).

The model of perceptions of the TLE, organized studying, and cynicism ($df = 146$, $\chi^2 = 317.631$, $p < 0.001$, GFI = 0.840, AGFI = 0.792, CFI = 0.869, TLI = 0.847, RMSEA = 0.085, SRMR = 0.108; see Figure 3) showed that alignment correlated positively with organized studying. The standardized direct effect of interest and relevance on cynicism was negative and statistically significant. However, the standardized direct effect of peer support on cynicism was positive, which was not in the expected direction. By contrast, the model showed that organized studying correlated negatively with cynicism. The standardized indirect effect of alignment on cynicism was negative and statistically significant ($\beta = -0.067$, $p = 0.043$). That is, organized studying mediated the relationship between alignment and cynicism.

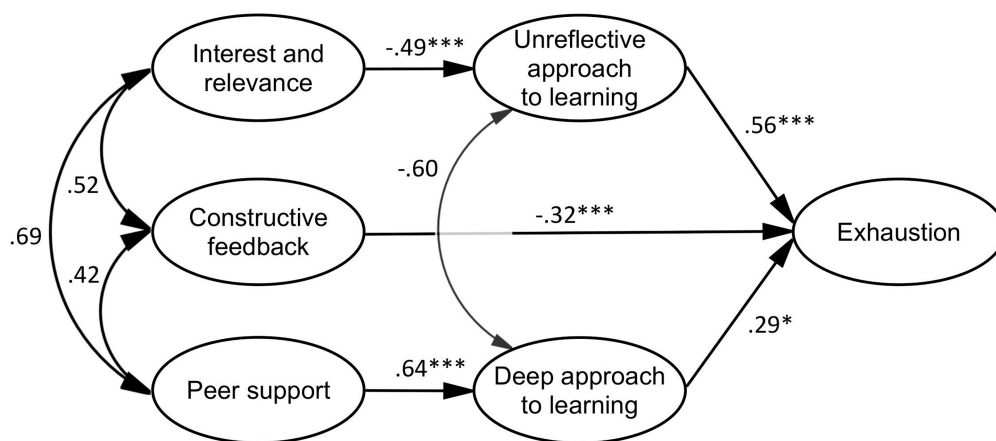


FIGURE 2
Mediation model of perceptions of the TLE, approaches to learning, and exhaustion. * $p < 0.05$, *** $p < 0.001$.

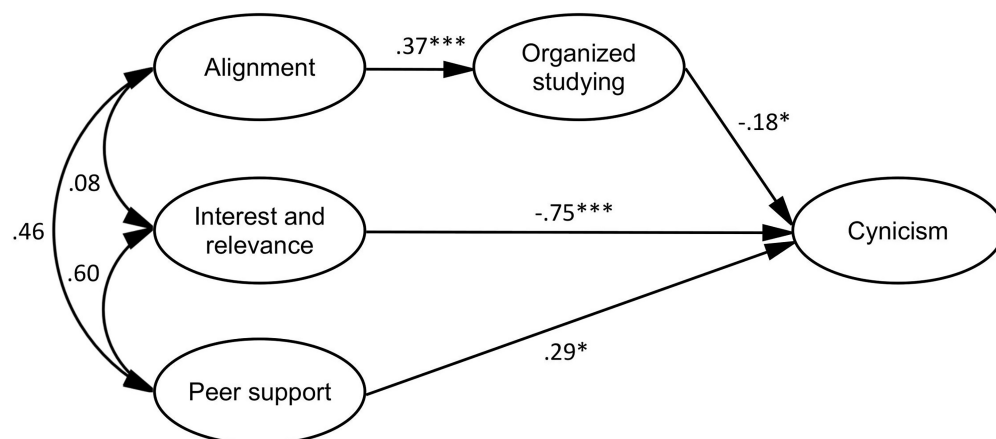


FIGURE 3
Mediation model of perceptions of the TLE, organized studying, and cynicism. * $p < 0.05$, *** $p < 0.001$.

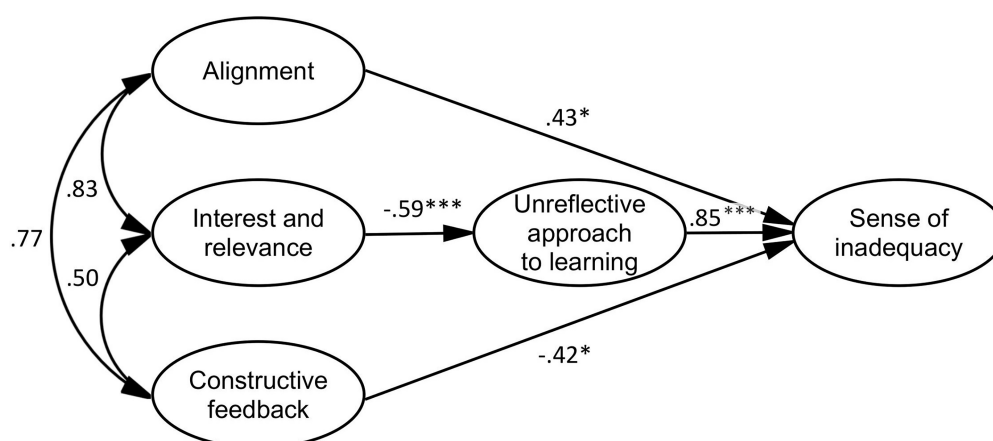


FIGURE 4

Mediation model of perceptions of the TLE, the unreflective approach to learning, and a sense of inadequacy. * $p < 0.05$, *** $p < 0.001$.

The model of perceptions of the TLE, the unreflective approach to learning, and a sense of inadequacy ($df = 97$, $\chi^2 = 215.436$, $p < 0.001$, $GFI = 0.860$, $AGFI = 0.804$, $CFI = 0.893$, $TLI = 0.867$, $RMSEA = 0.087$, $SRMR = 0.072$; see Figure 4) confirmed that interest and relevance correlated negatively with the unreflective approach to learning. Constructive feedback exerted a significant negative direct effect on a sense of inadequacy. By contrast, alignment had a significant positive direct effect on a sense of inadequacy. The standardized indirect effect of interest and relevance was negative and statistically significant ($\beta = -0.496$, $p < 0.001$). Therefore, the relationship between interest and relevance and a sense of inadequacy was mediated by the unreflective approach to learning.

Discussion

Similar trends regarding learning and burnout were found among international students in the present study as in previous studies on non-international students. University students, both international and non-international students, generally perceive peer support, interest and relevance more positively than other constructs of the TLE (Asikainen et al., 2014; Herrmann et al., 2017; Cheung et al., 2020). Moreover, the majority of international and non-international university students favor the deep approach to learning and organized studying over the unreflective approach to learning (prev. Surface approach to learning; Sakurai et al., 2014; Herrmann et al., 2017). Finally, they experience a greater sense of inadequacy and exhaustion than they did cynicism about their studies (Parpala et al., 2021a; Asikainen et al., 2022).

Relationship between students' perceptions of the TLE, approaches to learning, and study-related burnout

The results confirmed that international students with more positive perceptions of the TLE relied less on the unreflective

approach to learning and were more apt to apply the deep approach to learning and organized studying. This was in line with prior findings among non-international students (Herrmann et al., 2017). Moreover, a previous study among international students (Sakurai et al., 2016) found the same relationships between interest and relevance and approaches to learning.

The results showed that more positive perceptions of the interestingness and relevance of the TLE led to less exhaustion, cynicism and a sense of inadequacy among international students. Such negative correlations between interest and relevance and study-related burnout, especially cynicism, have also been found among non-international students in the same context (Asikainen et al., 2022). Cynicism also measures students' interest in their studies (Entwistle et al., 2002; Parpala and Lindblom-Ylänne, 2012), which could explain its strong relationship with interest and relevance.

In previous research, more positive perceptions of the TLE (peer community, faculty relationships, quality of teaching) have found to be associated with lower levels of burnout (Meriläinen, 2014; Tackett et al., 2017). However, due to recent developments in the theory and scales of perceptions of the TLE, the relationships between alignment, constructive feedback, peer support and aspects of study-related burnout have not been investigated; thus, our results constitute novel findings. First, though international students highly valued peer support, the negative correlation between peer support and study-related burnout was weaker than other perceptions of the TLE. Similarly, non-international students perceive peer support more positively than alignment and constructive feedback, while peer support displays a weaker association with study-related stress than that of other perceptions of the TLE (Cheung et al., 2020). Peer support has been regarded as an indispensable construct of the support system among both international students (Sakurai et al., 2016; Mitchell et al., 2017) and non-international students (Tackett et al., 2017). For example, non-international students' community of peers

has been found to be associated with less emotional exhaustion (Tackett et al., 2017). By contrast, Räsänen et al. (2020) found that non-international students who frequently participated in peer learning and valued peer support exhibited a higher level of exhaustion, which can be explained by peer pressure. Second, in our study, international students with a more positive perception of alignment tended to better manage their time and effort and experience less study-related burnout, especially cynicism. This result could be explained by the qualitative finding that clear expectations and carefully selected learning materials reduced international students' feelings of uncertainty, allowing them to easily build a sense of community and trust (Lin and Scherz, 2014). Third, the results showed a negative correlation between constructive feedback and study-related burnout. In Meriläinen (2014), non-international students' positive perceptions of the TLE were measured by approachable teachers and pedagogical counselling, and these constructs explained the lower levels of study-related burnout.

Relationship between students' approaches to learning and study-related burnout

The present study clarified the relationship between international students' approaches to learning and aspects of study-related burnout. International students' unreflective approach to learning correlated positively with exhaustion, cynicism and sense of inadequacy, which was in line with previous research among non-international students (Asikainen et al., 2019). For such international students, listening to lectures, reading material and completing assignments becomes more challenging and time consuming (Sakurai, 2021). Therefore, they are more likely to experience fatigue, tiredness and a loss of emotional energy. Such a situation also causes them to feel overwhelmed and to lack a sense of achievement.

In line with previous research among non-international students (Asikainen et al., 2019), the results indicated that international students' deep approach to learning and organized studying were negatively related to cynicism and a sense of inadequacy. That is, if international students struggled to integrate new information with previous knowledge or to manage their time and effort, they were more likely to challenge the meaning of study, lose interest and become indifferent.

Students' approaches to learning as mediators between perceptions of the TLE and study-related burnout

The results showed that the relationship between international students' perceptions of the TLE and study-related burnout was

mediated by approaches to learning. This was demonstrated, first, by the varying indirect effects of interest and relevance and peer support on exhaustion. The results indicate that if international students are highly motivated and rely less on the unreflective approach to learning, they experience less exhaustion. On the other hand, the results showed that more positive perceptions of peer support, along with the use of the deep approach to learning, are related to a higher level of exhaustion. One potential explanation is that intensive interaction with other students increases the complexity of learning processes and that students applying the deep approach to learning are more likely to investigate the subject matter thoroughly. These factors increase students' workload and thus contribute positively to exhaustion. Nevertheless, in both the present study and Asikainen et al. (2022; non-international students), the deep approach to learning correlated negatively, but below the level of statistical significance, with exhaustion. These results fail to confirm previous findings of a statistically significant negative association between non-international students' deep approach to learning and exhaustion and a negative direct effect of the deep approach to learning on exhaustion (Hu and Yeo, 2020).

Second, the results showed that if teaching aims are congruous with the content, process and assessment of learning, it is easier for international students to schedule their studies, potentially leading to less study-related cynicism. This supports the previous result that international students' organized studying mediated the relationship between organization and alignment and examination grades (Sakurai et al., 2016).

Third, the results showed that the negative relationship between interest and relevance and a sense of inadequacy was mediated by the unreflective approach to learning. However, it remains unclear why alignment exerted a positive direct effect on a sense of inadequacy in the model although alignment was negatively related to a sense of inadequacy. One possible explanation is that if learning tasks and goals are too strict, the activities and materials are overly organized or structured, leaving no space for students' aims and motivation. This could cause them to become overwhelmed by the work and lose their sense of achievement.

Practical implications

The present study has implications for improving teaching and support for students' well-being. In teacher training, it would be important to make teachers be aware of the relationship between TLE, learning, and well-being. So that they can support students' well-being in their teaching. Teachers should carefully select learning materials and design assignments such that they match the aims of the course. Moreover, it is necessary to ensure that students are clear about the learning task and the relevance of the content and to evoke their interest in actively participating in class. In this way, students can avoid self-doubt and experience

feelings of control and a sense of achievement (Lin and Scherz, 2014). When organizing class activities, sufficient time should be allotted for student interactions, especially when the learning tasks include comprehension or when the theme is tied to students' study experiences.

Considering the role of approaches to learning, to help international students adapt to the new TLE, teachers could provide detailed and understandable feedback to help students integrate new information with previous knowledge (Henderson et al., 2021). It is important to create a syllabus containing detailed information about the design of the course, clear expectations for submitting assignments and explicit outcomes for course participation (Lin and Scherz, 2014; Henderson et al., 2021). Moreover, if international students are clear about grading procedures, teachers' office hours, and expectations for making appointments, they can better manage their time and keep pace with the course schedule (Lin and Scherz, 2014). In this way, they are less likely to challenge the meaning of studying and to become indifferent to courses or even their entire study program.

Limitations and future research

The results of the present study should be seen in the context of the following limitations. First, the research is based on students' self-reported scales. Nevertheless, the results of confirmatory factor analysis verified that the factor structure of the observed variables was acceptable. Second, due to the small number of participants, the relationship between perceptions of the TLE and burnout with consideration of disciplinary variation was unable to carry out. Disciplines have been shown to affect approaches to learning and perceptions of the TLE among international students (Tian et al., 2021) and non-international students (Parpala et al., 2010, 2021b). For example, international students in arts, humanities and social sciences perceived teacher support more negatively than did students in life sciences and medicine (Tian et al., 2021). Though the participants were drawn from several faculties and thus constituted a representative target group, it remains unclear how the direct and indirect effects in the models change among students from different faculties or disciplines. Third, also due to the small sample size, it remains unknown how country of origin affects international students' perceptions of the TLE, approaches to learning or study-related burnout. Previous research in the same Finnish context has shown that European students less apply the surface approach to learning and organized in their studies than Asian students do, but the differences are small (Sakurai et al., 2016). Their perceptions of the TLE are not different from each other, except for teaching for understanding (Sakurai et al., 2016). The findings suggest that culture difference within international students does not lead to variety of perception of the TLE. Therefore, considering

the size of European and Asian students, the study does not examine difference in country of origin.

The findings indicate that the scales measuring both learning and the risk of burnout are robust, irrespective of students' nationality. Therefore, the present study suggests that to understand international students' perceptions of the TLE, approaches to learning, and study-related burnout, current theories and research based on university students in general could be used. Nevertheless, the inconsistent findings on the relationship between the deep approach to learning and exhaustion and how peer support affects study-related burnout suggest the need for further qualitative research.

The study suggests that study-related burnout should be assessed along with approaches to learning to reflect the complexity of the phenomenon. The findings imply that both the unreflective and deep approaches to learning could act as mediators between perceptions of the TLE and exhaustion. However, as the present study did not adopt a personal-oriented approach, interpreting the results requires further research. For example, one previous study demonstrated that in an online teaching situation, students scoring high on the unreflective and deep approaches to learning and organized studying experienced more exhaustion than did students representing other profiles (Parpala et al., 2021a). Thus, to obtain a clearer picture of these relationships, person-oriented methods should be used. In a further study, among the two profiles scoring relatively low on the unreflective approach and high on the deep approach to learning, students with higher scores for organized studying reported less cynicism (Parpala et al., 2021a). Consequently, rather than the unreflective and deep approach to learning, organized studying emerged as the mediator between perceptions of the TLE and cynicism.

Conclusion

This study explored the relationship between international students' perceptions of the TLE and study-related burnout, mediated by their approaches to learning. International students' sense of inadequacy was higher than their sense of exhaustion and cynicism. Moreover, their perceptions of peer support and interest and relevance were more positive than their perceptions of alignment and constructive feedback. Interest and relevance acted as the active construct of perceptions of the TLE affecting approaches to learning and study-related burnout. By contrast, strong positive evaluations of peer support failed to exert a strong effect on learning process or study-related burnout. On the whole, international students' exhaustion, cynicism and sense of inadequacy were affected by different constructs of perceptions of the TLE and approaches to learning. The study proves that approaches to learning act as mediators between perceptions of the TLE and study-related burnout.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

Author contributions

AT, AP, and YY developed the theory, designed the work, and drafted the work and revised it. YY collected the data, and performed the analyses, and coordinated the project. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Teacher career calling reduces burnout: The mediation effects of work engagement and psychological capital

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Burnout is a serious problem in the teaching profession. Research suggests that career calling could be regarded as a protective factor against burnout; however, the mediating mechanism underlying this relationship remains to be explored. The purpose of this study was to test the mediating roles of work engagement and teachers' psychological capital. A total of 3,300 teachers completed a self-report questionnaire. Results showed that the relationship between career calling and burnout was mediated by work engagement and teacher psychological capital. These findings provide insights for preventing burnout among teacher groups.

KEYWORDS

career calling, work engagement, burnout, teacher psychological capital, teachers

Introduction

Burnout, which refers to a series of physiological syndromes that manifest in the occupational environment as a result of stress reactions to chronic sources of emotional and interpersonal tension, has attracted the interest of both researchers and practitioners (Maslach et al., 2001). Teachers who experienced burnout tend to lose patience and compassion for their students, become less prepared for lessons and feel less in control of their work and less accomplished (Shen et al., 2015; Yu et al., 2015). Furthermore, teachers who experienced burnout could also be less enthusiastic about the consequences on teaching quality (Moè, 2016; Frenzel et al., 2019; Lazarides et al., 2021). One survey conducted by Lu (2001) found that primary and secondary school teachers in China are facing greater psychological stress, and this psychological stress has caused a certain negative impact on teaching (e.g., burnout) and students' development (Lu, 2001). Some previous studies have explored several factors that can affect teachers' burnout, such as self-efficacy (Pas et al., 2012; Gillet et al., 2022), emotion regulation (Bing et al., 2022), self-compassionate (Moè and Katz, 2020), teachers' life-responsive beliefs (Pishghadam et al., 2014), time perspective (Meidani et al., 2021) and anxiety (Pressley, 2021). However, little was known about the positive effect of career calling on teachers' burnout and its mediating mechanisms. Given the negative consequences caused by burnout, it's necessary to explore the potential protective factors against burnout among teachers.

Career calling and burnout

Career calling could be regarded as a protective factor against burnout. It is defined as a transcendent calling that comes from the self and goes beyond, a way to live out a particular life role in a way that demonstrates or gains a sense of purpose or meaning, as well as other-oriented values and goals as the basic source of motivation (Dik and Duffy, 2009). Research has shown that burnout among teachers can be predicted by the strength of career calling (Hagmaier et al., 2013). For example, one research found that people who regarded their work as their calling were able to adaptively deal with tensions and role conflicts (Oates et al., 2005) and suffer less stress and depression (Treadgold, 1999). According to expectancy-valence theory (Kominis and Emmanuel, 2007) extended by Lewin's (1938) social-behavioral motivation analysis and Tolman's (1951) cognitive-based model of motivation, career calling meant that individuals' work was driven by a deep internal motivation (Duffy et al., 2018; Lysovaa et al., 2019). This intrinsic motivation can reduce their feelings of burnout (Lian et al., 2021). Based on the theory and empirical evidence, this research proposed that burnout among teachers is negatively predicted by career calling.

Career calling, work engagement, and burnout

The relationship between career calling and burnout may be mediated by work engagement. Work engagement was defined as the control of the ego of an organizational member to integrate the ego with the work role (Kahn, 1990). It refers to the positive, fulfilling, energetic, dedicated, and focused psychological state of an individual toward work (Wu et al., 2014). According to the dual continuum model of motivation proposed by Pishghadam et al. (2021), individual active motivation and high career calling mean high work engagement, while the lack of work engagement turns into active demotivation, manifested as burnout. An important psychological characteristic of a career calling is an action orientation, a willingness to go the extra mile for the job (Xie et al., 2016). And it is a very strong intrinsic motivation that leads individuals to engage in work they like, actively search for relevant information, and improve their abilities (Dobrow and Tosti-Kharas, 2012). Therefore, there should be a close relationship between career calling and work engagement. One research conducted by Seco and Lopes (2013) found work engagement was positively predicted by career calling (Seco and Lopes, 2013).

Meanwhile, previous studies have examined the link between work engagement and burnout. Although they are both parts of occupational mental health, they are the opposite of each other (Qi et al., 2016). Maslach and Leiter (1997) argue that job burnout is the erosion of commitment to work that

makes otherwise important, meaningful, and challenging work unpleasant, meaningless, and unfulfilling (Wang and Qin, 2009). However, actively engaging in an activity requires a large amount of energy, attention, and concentration, which can counteract burnout to some extent (Pishghadam et al., 2019a). Some previous studies have found that there is a negative relationship between burnout and work engagement (Schaufeli et al., 2002). Thus, we proposed that work engagement may mediate the direct link between career calling and burnout.

Career calling, teacher psychological capital, and burnout

The relationship between career calling and burnout may also be mediated by the teacher's psychological capability. In the context of the positive psychology movement, Luthans et al. (2005) introduced the concept of psychological capital (Luthans et al., 2005), which can be defined as the core psychological element of general individual motivation, enabling individuals to gain a competitive advantage through targeted input and development.

Psychological capital is an upward and positive psychological state possessed by an individual, which is a potentially available intra-individual resource that can help individuals cope with difficulties and setbacks, and promote their growth and development (Luthans et al., 2007; Cheng et al., 2020). Based on the work as calling theory (Duffy et al., 2018), calling can represent meaningful experience and positive attitudes toward one's work. Calling comprises positive psychological capability, especially those that manifest positive emotion and attitude (Lian et al., 2021). Numerous studies have shown that career calling shows significant positive relationships with psychological capability such as life meaning experience, life satisfaction, and academic satisfaction (Zhang et al., 2013). From previous studies on psychological capital and burnout among elementary school teachers, civil servants, and college students, burnout was found to be negatively related to psychological capital (Liu and Fu, 2013). According to Hobfoll's resource conservation theory (Hobfoll, 2001), people always try to acquire and maintain the resources they consider valuable (including conditions, time, ability, etc.), and psychological capital, as a personal resource, helps individuals cope with work stress and reduce burnout (Hobfoll, 2001). Thus, this study proposed that the relationship between career calling and burnout is mediated by teacher psychological capability.

Career calling, work engagement, teacher psychological capital, and burnout

Furthermore, this study proposed that this relationship can be mediated by work engagement and teacher psychological

capital sequentially. Specifically speaking, career calling leads to high levels of work engagement, enhancing teacher psychological capital, thus reducing the level of burnout. The research operated by [Seco and Lopes \(2013\)](#) found that career calling was positively related to work engagement. [Mao and Xie \(2013\)](#) found that the positive correlation between teachers' psychological capital and work engagement was significant, and psychological capital positively predicted the variation of work engagement. Furthermore, previous research has found that teacher psychological capability negatively predicts burnout ([Hobfoll, 2001](#)). Thus, the relationship between career calling and burnout may be sequentially mediated by work engagement and teacher psychological capital.

Aims of this study

The principal motivation behind this study is twofold. First, this study aims to investigate the connection between career calling and burnout. Second, considering the analysis and confirmations of past research, we intend to test whether work engagement and teachers' psychological capital play parallel and multiple mediators. Based on the theory and the existing empirical results, we hypothesize that: (H1) Burnout is negatively predicted by career calling, (H2 and H3) work engagement and teacher's psychological capital play a mediating role, and (H4) work engagement and teacher's psychological capital play a chain-mediating role. [Figure 1](#) displays all the assumptions.

Methods

Participants

This study was approved by the local ethics committee and conducted by the Declaration of Helsinki and APA ethical standards. Data was collected online. And informed consent was

also provided to participants. All analyses were conducted with SPSS 21.0.

In the beginning, the data from 3,300 teachers from a city in Zhejiang Province were obtained. After screening, 2,929 valid responses (response rate: 89%) were included for further analysis. The final sample includes 853 male (29.1%) and 2,076 female respondents (70.9%), with an average age of 39 years ($SD = 8.67$). Teachers of kindergarten totaled 336 (11.5%); of primary school, 1,601 (54.7%); middle school, 675 (23.0%); and high school, 317 (10.8%). Participants had been teaching for an average of 17.90 years ($SD = 9.97$).

Measures

Career calling

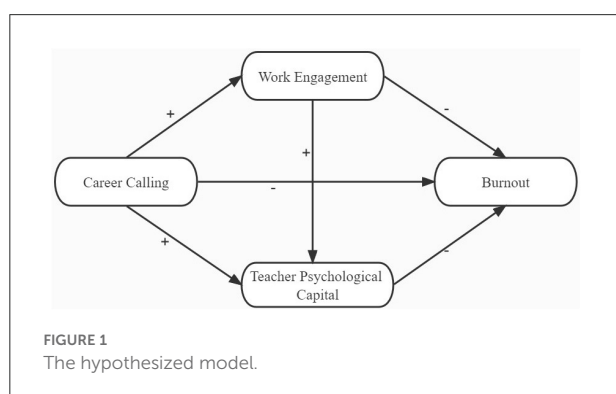
The Subjects' career calling was measured by the Chinese version of the career calling scale, which was adapted from the scale developed by [Dobrow and Tosti-Kharas \(2012\)](#). The scale consists of 12 items (e.g., "I am passionate about what I do"). All items were answered on a seven-point Likert scale (1 = not at all, 7 = very much). Higher scores implied a higher level of career calling. In this study, the Cronbach's α for the scale was 0.96. $\chi^2/df = 3.412$, CFI = 1.000, AGFI = 0.985, TLI = 0.996, RMSEA = 0.029 (90% CI = 0.020, 0.038), indicating the tool has a good validation.

Work engagement

Work engagement was assessed by the UWES9 Scale, which was developed by [Bakker et al. \(2000\)](#). The questionnaire included 9 items, such as "I feel myself bursting with energy in my work". Participants were required to answer on a five-point scale, which ranged from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicated a higher level of engagement in putting in the work. In this study, Cronbach's α for the scale was 0.94. $\chi^2/df = 2.410$, CFI = 1.000, AGFI = 0.992, TLI = 0.998, RMSEA = 0.022 (90% CI = 0.000, 0.048), which indicates a good validity.

Teacher psychological capital

Teacher Psychological Capital was using the Psychological Capital Questionnaire for Primary and Secondary School Teachers developed by [Zhang \(2010\)](#). The scale includes 19 items, such as "When I encounter difficulties in teaching, I am often at a loss as to what to do", and is scored on a 6-point scale from 1 (completely disagree) to 6 (completely agree), with higher scores indicating higher levels of organizational support for the individual. The Cronbach alpha coefficient of the scale in this study was 0.93. $\chi^2/df = 3.281$, CFI = 0.995, AGFI = 0.978, TLI = 0.988, RMSEA = 0.028 (90% CI = 0.024, 0.032), indicating the validity of the tool was good.



Burnout

Burnout was measured by the Professional Quality of Life Scale designed by [Stamm \(2010\)](#), which includes three dimensions: compassion satisfaction, burnout, and secondary traumatic stress. The subscale of burnout includes eight items rated on a five-point Likert scale (1 = never, 5 = very often), with higher scores indicating higher levels of burnout. The Cronbach alpha for the scale was 0.90. $\chi^2/df = 4.365$, CFI = 0.999, AGFI = 0.985, TLI = 0.989, RMSEA = 0.034 (90% CI = 0.013, 0.058), indicating the tool we used in this study has good validity.

Analytic strategy

Data analyses were performed using SPSS and the SEM module based on JASP ([Goss-Sampson, 2019](#)). First, descriptive statistics and correlation analyses were conducted on the main variables. Second, the structural equation model module was used to test the model. The parameters of the structural equation model analysis were set as follows: standardized estimates, bootstrap with replications (set at 1,000), emulation with Mplus, and estimator was set as maximum likelihood.

Results

Preliminary analyses

Means, standard deviations, and Pearson's correlations among variables were calculated and are shown in [Table 1](#). Career Calling was positively associated with Work Engagement, as well as with Teacher Psychological Capital. Work Engagement was positively correlated with Teacher Psychological Capital. Burnout was negatively associated with Career Calling, Work Engagement, and Teacher Psychological Capital. Years of teaching were positively correlated to Career Calling, Work Engagement, and Psychological Capital.

We compared the score of teacher burnout among kindergarten, primary school, secondary school, and high schools with One Way ANOVA analysis. The results of ANOVA were significant ($F_{(3,2925)} = 10.04$, $p < 0.000$). The results of *Post hoc* analysis showed that the score of burnout among

kindergarten teachers ($M = 2.00$, $SD = 0.71$) was smaller than primary school teachers ($M = 2.17$, $SD = 0.70$, $p < 0.000$), secondary school teachers ($M = 2.24$, $SD = 0.71$, $p < 0.000$), and high school teachers ($M = 2.24$, $SD = 0.71$, $p < 0.000$), and the score of burnout among primary, secondary and high school teachers has no difference.

The multiple mediation models

A structural equation model based on the SEM module of JASP was used to test the multiple mediation model ([Goss-Sampson, 2019](#)). Results showed that the pathways for the direct effect were significant (career calling \rightarrow burnout), which supports the H1. Moreover, the indirect effects *via* the work engagement and teacher psychological capital were also significant (i.e., “career calling \rightarrow work engagement \rightarrow burnout” and “career calling \rightarrow teacher psychological capital \rightarrow burnout”). Hence, the H2 and H3 were supported. In addition, we also detected a significant result in the pathway (career calling \rightarrow work engagement \rightarrow teacher psychological capital \rightarrow burnout), which supported the H4. Thus, the multiple mediation model was proved to be effective. The results of the mediation analyses are shown in [Figure 2](#).

Discussion

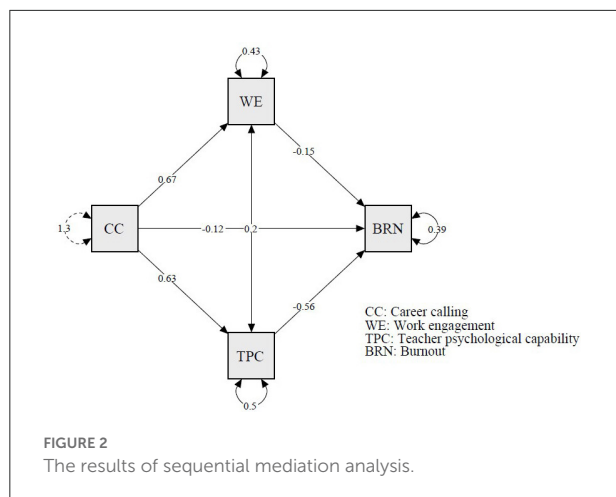
Different levels of burnout among different teachers' group

This study found that compared with kindergarten teachers, the level of burnout was higher among primary, secondary, and high school teachers. This result was similar to other previous studies ([Wu and Zheng, 2012](#); [Li et al., 2015](#)). One possible explanation for this difference may be that compared to kindergarten teachers, primary, secondary, and high school teachers would face more heavy teaching tasks due to that they should get more of their students into good middle schools, high schools, and colleges. Thus, they will experience more pressure and their level of burnout would be higher.

TABLE 1 Means, standard deviations, and Pearson's correlations among variables.

Variables	<i>M</i>	<i>SD</i>	YT	CC	WE	TPC	BO
YT	17.90	9.97	–				
CC	5.66	1.13	0.06**	–			
WE	3.90	0.78	0.09**	0.75**	–		
TPC	4.78	0.75	0.04*	0.71**	0.73**	–	
BO	2.16	0.70	0.02	–0.65**	–0.67**	–0.77**	–

YT, years of teaching; CC, career calling; WE, work engagement; TPC, teacher psychological capital; BO, burnout. ** $p < 0.01$.



Relationship between career calling and burnout

This study found that burnout was negatively predicted by career calling, supporting H1. The results were similar to previous findings. For instance, Zhang et al. (2020) found that among Chinese physicians, suffering from high levels of burnout threatened their career calling. Additionally, our results validated the Work as Calling Theory (Duffy et al., 2018), suggesting that career calling can represent meaningful experience and positive attitudes toward one's work, which can arouse more positive emotions and then reduce feelings of burnout. According to the research on stroke in language learning by Pishghadam and Karami (2017), teachers with high career calling will increase their degree to stroke students, which will affect students' evaluation of their level of success, to alleviate their burnout.

The mediating effect of work engagement

We found that work engagement played a mediating role in this relationship. Specifically speaking, teachers with high career calling are more likely to engage themselves in work, which indirectly reduces burnout. This result was consistent with previous findings (Schaufeli et al., 2002; Seco and Lopes, 2013) that career calling is positively related to work engagement, and burnout is negatively correlated with work engagement. This result can be explained as follows. Career calling provides individuals with a sense of meaning and identity at work, making people more engaged in their work (Duffy et al., 2012). In addition, Dobrow and Tosti-Kharas (2011) confirmed a significant correlation between

career calling and work engagement in an empirical survey of managers (Dobrow and Tosti-Kharas, 2011). Additionally, some researchers consider work engagement can be seen as the antipode of burnout (Sweetman and Luthans, 2010). According to Pishghadam (2016) research on emotioncy, teachers' high career calling will improve their received emotions and sensory input, which will affect teachers' work engagement, their understanding of reality, their perception of the future, and their perception of their career, that is, it will affect the level of burnout (Miri and Pishghadam, 2021; Pishghadam et al., 2022).

Previous studies have developed the theory of the structure of employee well-being, confirming the dichotomy between work engagement and burnout in terms of energy and identity dimensions, that is, lower work engagement means lower energy and dedication of the individual, which leads to emotional exhaustion and cynicism, ultimately leading to higher burnout (Maslach and Leiter, 1997; Schaufeli et al., 2002). Moreover, Relativism showed that sensory experience will affect our emotions. Based on different exploration and participation in the profession, teachers will have different degrees of career calling and develop different degrees of burnout (Pishghadam et al., 2016).

Hence, individuals with low career calling are more likely to work without engagement. Teachers who are prone to working with engagement tend to be energetic and enthusiastically involved in their work (Bakker et al., 2008), reducing burnout. Hence, the relationship between career calling and burnout may be mediated by work engagement.

The mediating effect of teacher psychological capital

This study found that teachers' psychological capital also played a mediating role in the relationship. Some previous findings can support this result (Hobfoll, 2001). According to the concept of Pishghadam et al. (2019b) sensory capital, teachers' psychological capital can be promoted by sensory capital, which can enhance teachers' emotional consciousness and improve their career calling. According to the Job Demands-Resources (JD-R) model of burnout (Bakker and Demerouti, 2007), strong job resources can reduce the level of job burnout to a certain extent, and calling may be an internal psychological resource that has motivational functions (Dicke et al., 2018; Nahrgang et al., 2011). Therefore, psychological capital, as an important personal resource, can be regarded as a special work resource to alleviate burnout. Additionally, the existing onion model of a good teacher (Korthagen, 2004) asserts that the deepest core feature of a good teacher is career calling. Unsurprisingly, high career calling can improve work motivation and improve teachers' psychological capital. As a

result, they become more willing to work hard and are less likely to experience burnout. This is the reason why teacher psychological capital could mediate the relationship between career calling and burnout.

The sequential mediating effects of work engagement and teacher psychological capital

A notable finding of this study was that the relationship between career calling and burnout was mediated by work engagement and teacher psychological capital sequentially, supporting H4. This finding was consistent with previous findings (Duffy et al., 2018). This implies that Chinese teachers with a high level of career calling usually tend to invest themselves in work, which enhances their psychological capital as teachers, ultimately decreasing their burnout.

Although little research directly tested the mediating roles of work engagement and teacher psychological capital between career calling and burnout, some previous results indirectly support the finding of this study. The sequential mediation model shows that work engagement is positively correlated with teacher psychological capital, which is consistent with the findings of previous studies (Mao and Xie, 2013). An explanation was that work engagement enhances teachers' life meaning experience, life satisfaction, and academic satisfaction (Zhang et al., 2013), which leads to elevated psychological capital. Work engagement commonly refers to a positive, fulfilling emotional and cognitive state related to work (Li and Ling, 2007). And the career calling happens to provide a sense of meaning and identity at work. Thus, individuals with high levels of occupational calling are more likely to be engaged in their work and to have more positive psychological capital, which reduces burnout.

Educational implications

This study reveals the mediating mechanisms underlying the relationship between career calling and burnout. In addition, this study has significant practical implications. Firstly, this study found that teacher career calling has a positive effect on preventing burnout. Thus, the utilization and cultivation of career calling could be used to design interventions to prevent burnout. On the one hand, school administrators could make teachers focus on their career development; on the other hand, administrators could help teachers tap into their inner voices and make them feel the meaning and value of their work through all kinds of activities. Secondly, based on the findings of this study, boosting teachers' work engagement and teacher psychological capability should also be

considered an effective way to reduce burnout. For example, school administrators should talk with teachers about their work engagement and teacher psychological capability, to avoid burnout. Specifically speaking, the education sector should provide primary and secondary school teachers with more abundant learning resources, pay more attention to the teachers' psychological development, and appropriately increase the content of teachers' psychological construction in teacher professional training, all of these manners may be effective to increase work engagement and supply psychological capital for teachers.

Limitations and future directions

This study has several limitations. First, the cross-sectional survey design we used had difficulties in concluding the causality. The longitudinal or experimental design may be used in future research. Second, the sample in our study was from the same city, resulting in deficits in generalizing the results. Future research should choose a more representative sample to investigate teachers' burnout.

Conclusion

This study found that the relationship between career calling and burnout was mediated by work engagement and teacher psychological capital in a parallel and sequential manner. This study suggests that strengthening work engagement and teacher psychological capital may effectively help teachers reduce burnout.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by Zhejiang Normal University. The patients/participants provided their written informed consent to participate in this study.

Author contributions

WL, BS, and XZ: conceptualization. KW: methodology. WL and BS: resources and project administration. XZ and KW: writing—original draft preparation and writing—review and editing. WL: supervision and funding acquisition. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships

that could be construed as a potential conflict of interest.

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Teachers' demographic and occupational attributes predict feelings of hopelessness during the COVID-19 pandemic

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The outbreak of the COVID-19 pandemic has resulted in many emotional consequences for teachers, including feelings of isolation, loneliness, and hopelessness. However, evidence on the prevalence of hopelessness and the associated factors in teachers during the pandemic is limited. The purpose of this research was to examine the prevalence of hopelessness in public school teachers and identify risk factors associated with it. A sample of 168 teachers aged 25–49 years participated in the study by completing the Socio-Demographic Questionnaire, the Beck Hopelessness Scale (BHS), and the Multi-Dimensional Scale of Perceived Social Support (MSPSS). The results revealed a moderate level of experienced hopelessness in teachers. Hopelessness prevalence was also significantly different across teacher gender (males=79%), age groups (>40=77%), socioeconomic status (poor socioeconomic status=70%), educational level (high school teachers=79%), professional experience (experienced teachers=82%), and perceived social support (low perceived social support=79%). The results of a logistic regression analysis confirmed the effects of these demographic and occupational attributes on hopelessness by explaining ~71% of the variance in hopelessness feelings. Higher odds ratios were associated with age, socioeconomic status, and perceived social support, signifying the prominence of these factors in predicting hopelessness. The study contributes to identifying and screening teachers at risk of hopelessness in public schools and recommends promoting collegial/superior support as well as a positive school climate as the protective factors against hopelessness.

KEYWORDS

hopelessness, perceived social support, occupational attributes, public school teachers, COVID-19 pandemic

Introduction

The teaching profession has been regarded to be a highly stressful profession with significant attrition rates due to high emotional involvement and heavy workloads (Skaalvik and Skaalvik, 2011; Harmsen et al., 2018; Ghasemi et al., 2022). Evidence suggests that there has been a significant shift in teachers' internalizing symptoms and coping

mechanisms during the COVID-19 pandemic compared to the pre-pandemic era upon experiencing new demands (Ghasemi et al., 2022). With the outbreak of the COVID-19 pandemic, new risk factors (e.g., isolation and lockdown, social and physical distancing, loss of employment, and income reduction) may threaten teachers' emotional and mental health (Baker et al., 2021). Common consequences of such threats for teachers were heightened stress, anxiety, and depression (Santamaría et al., 2021), which may have been caused by restricted social interactions and support (Tull et al., 2020). In other words, loneliness, isolation, and lack of social support have been found to be positively associated with mental disorders (e.g., depression and hopelessness), undermining individuals' performance (Tull et al., 2020; Wootton et al., 2022).

In addition to marked increases in stress and depression, there were also reports of high levels of hopelessness during the pandemic (Holman et al., 2020; Wootton et al., 2022). Evidence suggests that hope has significant direct effects on one's psychological health and subjective well-being (Yildirim and Arslan, 2022). Therefore, hopelessness could be a critical risk factor for individuals' mental health, initiated by the negative beliefs resulting from decreasing positive expectations about the future. According to Beck's cognitive model of hopelessness, hopelessness, revealing a psychological situation, is the pessimism in the individual's perspective toward life and the future (Beck et al., 1976). Such negative beliefs might urge an individual to develop suicidal ideation and behaviors.

There appear to be several contributing risk factors to hopelessness. For instance, individuals with affective temperaments (e.g., anxious, depressive, and irritable temperaments) may be particularly at risk for hopelessness and suicidal behavior (Baldessarini et al., 2017). Based on the learned hopelessness theory of depression (Abramson et al., 1989), there is a causal chain beginning with the negative life events (e.g., COVID-19) influenced by situational cues (e.g., negative

feedback) and inferential styles (i.e., internal vs. external) and ending with hopelessness deficits (e.g., passivity, motivational and emotional deficits, negative cognitions). In particular, hopelessness deficits may also include lowered self-esteem, which is associated with low perceived social support and interpersonal relationships (see Kleiman and Riskind, 2013). Therefore, individuals with low self-esteem have low perceived social support, which may increase the levels of hopelessness feelings (Cakar and Karatas, 2012). This model of hopelessness offers a comprehensive causal pathway that ends in the development of hopelessness. This model has also been adapted to academic settings (Au et al., 2009) by discussing the causal relations between hopelessness and academic risk factors (e.g., academic failures, academic attributional style, and contextual factors). The adapted model could also be applied to teachers. For instance, a teacher exposed to prolonged negative feedback on the part of his/her colleagues, administrators, parents, or students may develop uncontrollability cognitions, implying that negative outcomes are uncontrollable. These cognitions refer to the attributional style of the teachers in comprehending their failures, which may lead to hopeless behaviors if failures are attributed to stable and global causes (e.g., lack of teaching competence). Such attributions, accompanied by lowered self-esteem and contextual factors (e.g., lack of appreciation, lack of collegial support, and unrealistic expectations), may diminish teachers' perceived social support and impair their ability to demonstrate help-seeking behaviors, resulting in teacher hopelessness (see Au et al., 2009; Cakar and Karatas, 2012).

Figure 1 depicts an expanded hopelessness theory of depression (Panzarella et al., 2006), which examines the role of social support in the etiological chain leading to hopelessness and depression. This theory demonstrates the mechanisms by which lack of social support and low adaptive inferential feedback may influence the onset, maintenance, or prevention of hopelessness and depression. First of all, social support could reduce (a) the

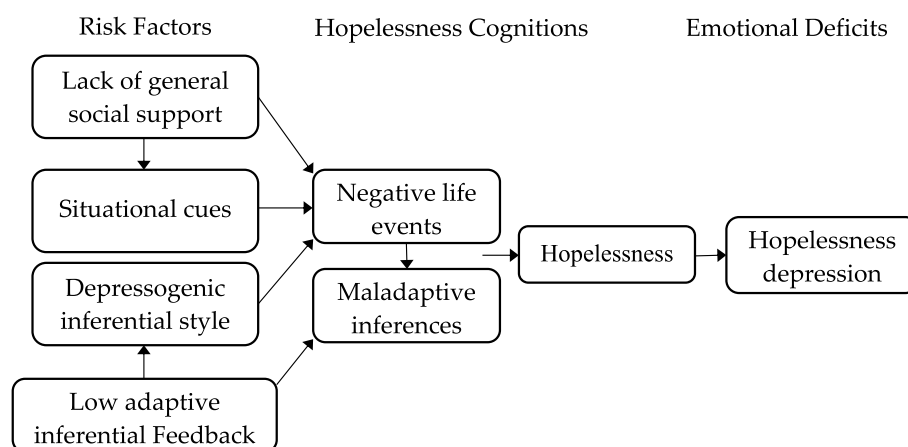


FIGURE 1
The expanded hopelessness theory of depression (based on Panzarella et al., 2006).

severity of stressful events that one may experience, (b) the cognitive vulnerability to depression using positive inferential styles, and (c) the probability of making maladaptive inferences regarding negative life events. Additionally, social support could affect the development and maintenance of a depressogenic inferential style, which refers to consistent attribution of negative life events causes to stable/global factors (Abramson et al., 1989). This cognitive style, as a risk factor for hopelessness, may increase the probability that one would make negative inferences in the face of a stressful situation. However, by providing feedback inconsistent with depressogenic inferences, adaptive inferential feedback may buffer against a negative inferential style.

The buffering effects of social support may occur either after a potentially stress-inducing event and prior to experiencing stress by affecting event appraisal, or after experiencing stress and before developing hopelessness by influencing appraisal of coping abilities or resources. Individuals in the support network may offer adaptive inferences in these situations to attribute the cause of the negative event to unstable, specific factors rather than to stable, global factors. As the opposite of depressogenic inferences, adaptive inferences by a colleague could help a teacher to ascribe a failure in the classroom to the lack of prior preparation rather than to the lack of competence in teaching (global/stable factor). In other words, the offered adaptive inferences may prompt the individual to reappraise his/her cognitions regarding the situation, resulting in the modification of the original maladaptive inference or reducing its severity and thereby, the probability of experiencing feelings of hopelessness. The most common types of social support associated with adaptive inferential feedback are informational and emotional support, which reduce one's vulnerabilities to depressogenic inferences by providing feedback about stressors and individuals' feelings and appraisals (Panzarella et al., 2006). Therefore, social support could play a significant role in buffering against hopelessness and depression and should be further studied during the COVID-19 pandemic when there were rigid social distancing rules, limiting perceived social support during a crisis (Tull et al., 2020; Ferber et al., 2022; Ghasemi et al., 2022).

Based on a recent study (Wootton et al., 2022) examining the level of hopelessness and its association with coping mechanisms (i.e., (dys)functional coping), there was an increase in the prevalence of hopelessness during the pandemic. Additionally, they found that dysfunctional coping was associated with heightened hopelessness, indicating the significance of coping mechanisms in controlling hopelessness feelings. Participants of the study also reported seeking support from family, friends, and mental health practitioners to manage their emotions and pandemic-related stressors. Therefore, seeking social support as a functional coping strategy has the potential to help teachers with emotional and mental problems and foster hope and optimism about the future (Ghasemi, 2022b). In other words, to deal effectively with hopelessness, teachers usually seek social support from family, friends, and/or therapists, which is considered an approach or functional coping. However, they may also utilize dysfunctional coping mechanisms (e.g., negative self-talk and

self-blame), resulting in the sustenance of the disorder and/or deteriorating their mental health (Ghasemi et al., 2022; Ghasemi, 2022b). Social support also mediates the effects of life satisfaction and hopelessness on health-risk behaviors in academic settings, suggesting the importance of perceived social support in maintaining one's health (Lai and Ma, 2016). According to a recent research study (Zuo et al., 2021) with healthcare workers during the pandemic, perceived social support negatively predicted hopelessness and can work as a psychological protective factor for alleviating it. Therefore, increasing one's social support could be beneficial to his/her mental health and hopelessness feelings during a crisis.

Hopelessness has also been investigated in terms of demographic attributes. Hamzaoglu et al. (2010), examining the prevalence of adult hopelessness, found higher rates of hopelessness in males (35%), literates (60%), rural workforce (50%), and those with perceived bad health (59%), demonstrating the significance of demographic characteristics, social class, and perceived health in the rates of hopelessness feelings. However, the prevalence of hopelessness was higher for females and those with increased income among healthcare workers during the pandemic (Akova et al., 2022). In a general population sample of adults, the relative risk for stable hopelessness in unemployed men was found to be 7.2, and the risk was higher for women with a poor financial situation (3.8) than men (3.5; Haatainen et al., 2003). Therefore, it appears that hopelessness risk factors across demographic attributes may vary based on investigated population, indicating the need to conduct studies with different populations to examine the effects of various factors. The evidence regarding the prevalence of hopelessness in teachers is also limited, and further investigations regarding how hopelessness severity may vary for this population across gender, socioeconomic status, and education are required. As the literature on hopelessness and depression (e.g., Beekman et al., 1999; Haatainen et al., 2004; Hamzaoglu et al., 2010) indicates higher prevalence rates of these mental health issues for females, older people, and those living under adverse socioeconomic circumstances, we expect to find similar results for teachers due to the high association between hopelessness and depression (Au et al., 2009).

Current study

Despite studies investigating feelings of hopelessness in teachers and the association of hopelessness with loneliness, self-esteem, job satisfaction, depression, and mental health (e.g., Haatainen et al., 2004; Chang et al., 2010; Cakar and Karatas, 2012; Balat et al., 2019; Huang, 2022), few studies attempted to determine the prevalence of hopelessness in school teachers to understand how it differs in terms of demographic and occupational attributes. In particular, there is limited evidence available on how it is associated with social support and the extent to which social support, as well as demographic attributes, could account for teacher hopelessness. Accordingly, this study aimed to (a) investigate the rates of hopelessness feelings in teachers during

the pandemic, (b) understand how it is associated with teachers' diverse demographic and occupational attributes, and (c) explore the extent to which these attributes account for the variations in hopelessness. We expected to find a high prevalence of hopelessness feelings in teachers due to the severe emotional and professional consequences of the pandemic for teachers in Iran (Ghasemi et al., 2022). Given the significance of the associations between hopelessness and demographic characteristics of individuals in the literature, we hypothesized to find similar results regarding such associations. Regarding the last aim, we hypothesized that teachers' demographic and occupational attributes predict their feelings of hopelessness due to the significance of such attributes in accounting for well-being, perceived social support, emotional experiences, and coping mechanism.

Findings from the current study can help our understanding of the prevalence of hopelessness in schools and contribute to screening and identifying at-risk teachers. Additionally, studying the significance of social support in alleviating hopelessness symptoms could inform public health efforts to provide collegial/superior support for at-risk teachers by engaging them in functional coping behaviors (e.g., effective help-seeking behaviors). In other words, this inquiry could help the policymakers, administrators, school psychologists, and teachers understand possible hopelessness risk factors to promptly diagnose and intervene to effectively treat it.

Materials and methods

Research design

Since this study examines the prevalence of experienced hopelessness in teachers and is an attempt to understand individual differences based on demographic and occupational attributes, a cross-sectional design was used.

Participants and research context

The working context of the research consists of secondary schools in Tehran, Iran. The education system in Iran is centralized and divided into K-12 settings with primary and secondary schools. Besides public schools, parallel private schools with a similar educational system and higher academic qualities are also available. Unlike private schools, where teachers usually deal with students with high socioeconomic status and receive high salaries, teachers in public schools receive low salaries and face students with disruptive behaviors and low socioeconomic status, which may give rise to extra pressure, stress, and/or anxiety (Ghasemi, 2022b).

A total of 203 teachers working in secondary public schools in Tehran were invited to participate in this research based on the results of a power analysis using G*Power 3.1.9.7 (Erdfelder et al., 2009). The projected sample size needed was $n = 153$ based on a

small effect size of $f = 0.15$, $\alpha = 0.05$ and power $(1 - \beta) = 0.95$. We had to use convenient sampling to invite the interested teachers to participate in the current study due to the consequences of the pandemic (e.g., social distancing, school closure, and remote working of teachers). All the invited teachers were briefed about the voluntary participation and study procedure by providing instructions and information regarding the study in the group channel. To be eligible to participate in the study, teachers were required to (a) have more than a year of teaching experience and (b) teach at public schools. The exclusion criteria were: (a) having less than a year of teaching experience, (b) working at private schools, and (c) attending any concurrent psychological intervention. Of the 203 teachers, 35 (17%) declined to participate in the current study, reducing the sample size to 168 (83%) teachers. Therefore, the final study sample was 168 teachers working in secondary public schools (i.e., middle and high schools) in Tehran, who were recruited by a non-probability convenient sampling method. The relevant frequencies and distributions of the demographic and occupational attributes of the participants are demonstrated in Table 1. Participating teachers were categorized based on their expertise (novice: ≤ 3 years; experienced: > 3 years), guided by the research literature on teaching expertise. Socioeconomic status data were calculated based on the participants' monthly income and living costs by considering their occupation and education. Based on these evaluations, most of the participants were rated to have low socioeconomic status.

Measures

Socio-demographic questionnaire

There were six questions regarding participants' gender, age, socioeconomic status, educational level, academic degree, and professional experience in the Socio-Demographic Questionnaire. We used this measure to collect the demographic characteristics of the participants.

Beck hopelessness scale

The BHS was developed by Beck et al. (1974) to determine the negative expectation level of an individual about the future. This self-assessment scale consists of 20 items with 11 true and nine false statements regarding an individual's feelings and expectations about the future. The questions on the scale are answered in a right-wrong manner, and the scale reflects negative expectations. The obtained total score constitutes the "hopelessness" score ranging from 0 to 20. A higher score demonstrates a higher level of experienced hopelessness. Hopelessness scores obtained from the BHS are interpreted with the following cutoff points: 0–3 means a lower level of hopelessness, 4–8 is mild hopelessness, 9–14 is moderate hopelessness, and 15–20 is severe hopelessness (Beck and Steer, 1988). The scale consists of three dimensions: affective (feelings about the future), motivational (loss of motivation), and cognitive (expectations concerning the future).

TABLE 1 Teachers' demographic and occupational attributes ($N=168$).

Attributes	Group	<i>n</i>	%
Age	25–30	70	41.7
	30–35	44	26.2
	35–40	32	19.0
	> 40	22	13.1
Gender	Male	92	54.8
	Female	76	45.2
Education	B.A.	103	61.3
	M.A.	44	26.2
	Ph.D.	21	12.5
Education Level	Middle school	97	57.7
	High school	71	42.3
Socioeconomic status	Low	89	53.0
	Middle	58	34.5
	High	21	12.5
Professional experience	Novice	101	60.1
	Experienced	67	39.9
Total Participants		168	100.0

The scale has been shown to be internally consistent ($\alpha = 0.81$; Kocalevent et al., 2017).

As the factor structure of the BHS may differ in clinical and nonclinical subjects as a function of nationality (Pompili et al., 2007), we performed confirmatory factor analysis (CFA) in the study sample, to investigate three competing models: (1) three-factor model, (2) an alternative two-factor model, and (3) another alternative one-factor model. We used weighted least squares to estimate the BHS factor models due to the multivariate non-normality of data and the dichotomous nature of variables. The adequacy of the model was assessed by a range of fit indices, namely the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker–Lewis Index (TLI) with 95% confidence intervals. CFI and TLI ratios ≥ 0.90 , SRMR ≤ 0.08 , and RMSEA ≤ 0.08 show acceptable fit, whereas good fit obtains CFI and TLI ≥ 0.95 , SRMR ≤ 0.06 , and RMSEA ≤ 0.06 (Hu and Bentler, 1999).

To test the three-factor model, items were set to load on the Affective, Cognitive, and Motivational factors to understand if items would converge in a three-factor structure as originally specified in the BHS (Beck et al., 1974). The results indicated a good model fit (RMSEA = 0.06, SRMR = 0.06, GFI = 0.94, CFI = 0.95, NFI = 0.93, TLI = 0.96). All items loaded significantly on their allocated factors. Examination of levels of factor loading indicated satisfactory factor loading of all items on the related factors (0.356–0.869) except for item 4 (0.196). Factor correlations between the Cognitive and Affective factors (0.89), the Cognitive and Motivational factors (0.78), and the Motivational and Affective factors (0.81) indicated poor differentiation.

To test the alternative two-factor model with two distinct content-related factors (i.e., hopelessness vs. hopefulness), as proposed by Szabó et al. (2016), we set all positively worded items to load on the Hopefulness factor and all negatively worded items

on the Hopelessness factor. The results of the analysis exhibited acceptable model fit (RMSEA = 0.07, SRMR = 0.08, GFI = 0.91, CFI = 0.93, NFI = 0.91, TLI = 0.92). All items significantly loaded on their allocated factors (0.298–0.804) except for item 3 (0.187). There was also a high correlation between the factors (-0.87), indicating poor differentiation.

Finally, we assessed the one-factor model by allowing all items to load on one overall hopelessness factor. CFA of the one-dimensional model demonstrated a good model fit (RMSEA = 0.05, SRMR = 0.06, GFI = 0.97, CFI = 0.95, NFI = 0.93, TLI = 0.95). Compared to other models, this one-factor model exhibited better fit indices. As the correlations only marginally differ per factor in two- and three-factor models and due to a poor differentiation between factors, we used the one-dimensional approach to assess participants' experienced hopelessness. The Kuder–Richardson reliability coefficient for the one-dimensional model was 0.71.

Multi-dimensional scale of perceived social support

This measure (Zimet et al., 1988) is a self-report questionnaire with 12 items that measure individuals' perceptions of social support with three dimensions (i.e., family, friends, and significant others). Participants rate the sentences (e.g., "I can count on my friends when things go wrong") on a 7-point Likert scale ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*). Total scores were calculated across items with higher scores denoting higher levels of perceived social support. The scale has demonstrated excellent internal consistency ($\alpha > 0.91$) and good convergent validity ($r = 0.48$; Nearchou et al., 2019). Factor structure, reliability, and validity of the scale have also been examined in Iran, demonstrating acceptable values. The results of CFA in the study sample

revealed adequate model fit (RMSEA = 0.06, SRMR = 0.05, GFI = 0.95, CFI = 0.93, NFI = 0.96, TLI = 0.94). The Cronbach's alpha reliability value of the scale in the current study was 0.70.

Procedures

Primarily, the researcher met with the department of education and public school administrators in several districts to find interested teachers and to ask them to complete and share the questionnaires with other teachers. The surveys had all the required instructions and informed consent to communicate voluntary participation. As the use of social media increased during the pandemic for teachers to communicate with each other and their students, we used a WhatsApp channel (a common social platform in Iran) to collect data. The administrators introduced the channel with members of teachers working at public schools in Tehran to the researcher, who were invited to participate in the study. This channel had 203 members of teachers, who were briefed about the purpose, procedure, and timeline of the study, as well as their rights and privacy. After responding to teachers' inquiries, we shared the surveys in the channel to be completed. Of the 203 members of the group channel, only 168 (82%) teachers completed and returned the surveys through WhatsApp to the researcher.

The participating teachers were also paid for their time and collaboration in completing the surveys of the study. The results of the study were also shared with them at the end of data collection. The data collection procedure lasted almost a month and was completed in May 2021. Surveys with missing data or incomplete measures ($n = 8$) were returned to the participants to be completed again. The study was initiated in March 2021 and completed in June 2021.

Data analysis

We used SPSS version 26 to analyze the data. In the analysis of the data, the arithmetic means and standard deviations were calculated, and the prevalence of hopelessness in the sample was reported in percentages. The Chi-square (χ^2) test was used to analyze differences between independent variables and hopelessness prevalence by forming double cross tables. Therefore, the sample was divided into "hopeless" and "not hopeless" teachers based on the cutoff values. A Kendall's tau-b was conducted to investigate the relationship between perceived social support and hopelessness. We hypothesized that perceived social support should be negatively associated with hopelessness. Then, we conducted a binary logistic regression to test the potential effects of the demographic and occupational attributes on teacher hopelessness and to report odds ratios (OR) with the corresponding p -values and confidence limits.

Results

Prevalence of teacher hopelessness

The mean score on the hopelessness scale was 9.01 ($SD = 5.92$, $N = 168$), demonstrating a moderate hopelessness level in the population. The results indicated that 28 teachers (29%, $M = 17.78$, $SD = 1.17$) experienced severe hopelessness, 50 teachers (53%, $M = 13.36$, $SD = 0.963$) experienced moderate hopelessness, and 17 teachers (18%, $M = 7.52$, $SD = 0.717$) reported mild levels of hopelessness. Table 2 presents the results of Chi-square tests indicating the prevalence of experienced hopelessness in teachers. The prevalence of hopelessness was 56.5%, indicating a high occurrence of this mental health issue among teachers. The risk of being diagnosed with hopelessness as a function of gender was higher for males (79%, Relative risk = 2.07, 95% CI [1.56, 2.76]). There was also a significant difference between novice and experienced teachers in feelings of hopelessness. The prevalence and relative risk of hopelessness feelings were greater for the experienced teachers (82%, Relative risk = 2.06, 95% CI [1.59, 2.70]).

Age was another significant factor associated with hopelessness feelings. The results indicated higher levels of hopelessness in older ages (>30), and the risk of hopelessness heightens with an increase in age. The odds ratio for age (25–30 and >40) and hopelessness feelings were quite large (OR = 8.50, 95% CI [2.76, 26.15]), representing a strong association between these variables. More precisely, the relative risk of hopelessness feelings for teachers over 40 years of age was 2.71 (95% CI [1.75, 4.17]) higher than for teachers within the 25–30 age range. Additionally, the prevalence of hopelessness was high for teachers with >40 (77%) and 30–35 (77%) age ranges. Regarding participating teachers' education, we found no significant difference between groups ($p > 0.05$), indicating that the academic degree of the teachers was not associated with their hopelessness. In other words, the prevalence of hopelessness feelings among teachers with different educational degrees was approximately consistent (52%–59%). However, hopelessness feelings were different in teachers working in middle schools and teachers working in high schools. The prevalence and relative risk of hopelessness feelings were higher for teachers working in high schools (79%, Relative risk = 1.96, 95% CI [1.49, 2.57]) than for teachers working in middle schools (40%).

Another important factor associated with hopelessness was socioeconomic status, which revealed a strong relationship (OR = 7.34, 95% CI [3.82, 52.44]). Compared to teachers with high (24%) and middle (48%) socioeconomic status, experienced hopelessness was higher for teachers with low socioeconomic status (70%). In other words, the relative risk of experiencing hopelessness for teachers with poor socioeconomic status was 2.93 (95% CI [1.34, 6.36]) higher than for teachers with high socioeconomic status. Therefore, poor socioeconomic status could be a significant risk factor associated with hopelessness feelings in teachers. Similarly, there was a significant difference

TABLE 2 Prevalence of hopelessness based on demographic and occupational attributes.

Attributes	Hopelessness				χ^2	p	OR (95% CI)	ϕ	Total
	Yes		No						n , %
	n	%	n	%					
Age groups									
25–30	20	28.6	50	71.4	38.26	0.000	8.50 (2.76, 26.15) ¹	0.47	74, 44.0
30–35	34	77.2	10	22.7					42, 25.0
35–40	24	75.0	8	25.0					32, 19.0
>40	17	77.3	5	22.7					20, 11.9
Gender									
Male	60	78.9	16	21.1	28.34	0.000	6.11 (3.05, 12.22)	0.41	76, 45.2
Female	35	38.0	57	62.0					92, 54.8
Education									
B.A.	58	56.3	45	43.7	0.267	0.923	0.969 (0.37, 2.53) ³	0.04	104, 61.9
M.A.	26	59.1	18	40.9					44, 26.2
Ph.D.	11	52.4	10	47.6					20, 11.9
Education Level									
Middle school	39	40.2	58	59.8	24.94	0.000	5.55 (2.75, 11.17)	0.38	97, 57.7
High school	56	78.9	15	21.1					71, 42.3
Socioeconomic status									
Low	62	69.7	27	30.3	17.01	0.000	7.34 (3.82, 52.44) ²	0.32	91, 54.2
Middle	28	48.3	30	51.7					57, 33.9
High	5	23.8	16	76.2					20, 11.9
Professional experience									
Novice	40	39.6	61	60.4	29.59	0.000	6.99 (3.33, 14.66)	0.42	101, 60.1
Experienced	55	82.1	12	17.9					67, 39.9
Perceived social support									
Low	72	79.1	19	20.9	41.17	0.000	8.89 (4.40, 17.96)	0.49	91, 54.2
High	23	29.9	54	70.1					77, 45.8
Total	95	56.5	73	43.5					168, 100

¹Assessed based on 25–30 and > 40 age ranges.²Assessed based on low and high socioeconomic status.³Assessed based on B.A. and Ph.D. academic degrees.

between groups of teachers in terms of perceived social support and the associated hopelessness feelings. As expected, the prevalence of hopelessness was greater for teachers with low perceived social support (79%) than teachers with high perceived social support (30%). The results indicated that the relative risk of being diagnosed with hopelessness as a function of perceived social support was 2.64 (95% CI [1.85, 3.79]) times greater for teachers with low perceived social support. The effect sizes for all significant associations in findings were moderate ($\Phi = 0.32$ – 0.49).

Effects of demographic and occupational attributes

Binomial logistic regression was performed to understand the effects of teachers' demographic and professional attributes (independent variables) on the probability that participants may experience hopelessness feelings (outcome variable). The

logistic regression model was statistically significant, $\chi^2(11) = 125.46, p < 0.001$. Additionally, the model explained 70.6% (Nagelkerke R^2) of the variance in hopelessness feelings and correctly classified 83.3% of cases.

The results indicated that gender significantly influences hopelessness feelings ($\beta = 1.25, SE = 0.53, p = 0.02$) by increasing the relative risk of hopelessness feelings for males, $\exp(B) = 3.50, 95\%CI [1.22, 10.03]$. In other words, the probability of experiencing hopelessness for males is 3.50 times higher than for females. The findings also indicated that teachers' professional experience significantly predicts hopelessness feelings ($\beta = 1.97, SE = 0.91, p = 0.03$). The odds of experiencing hopelessness were $\exp(B) = 7.23 (95\%CI [1.21, 23.10])$ times greater for experienced teachers as opposed to novice teachers.

Age was also a significant predictor of the prevalence of hopelessness in teachers within the 30–35 age range ($\beta = 2.31, SE = 0.85, p < 0.001$) and teachers over 40 years ($\beta = 2.08, SE = 1.34, p = 0.04$). Compared to teachers with other age range (i.e., 25–30 and 35–40), the relative risk of experiencing

hopelessness in these teachers were significantly high ($\exp(B) = 11.63$, 95% CI [5.19, 37.07]), suggesting older age as a risk factor affecting teacher hopelessness. Regarding teachers' education, there was a significant reduction in hopelessness levels of teachers with M.A. ($\beta = -3.61$, $SE = 1.03$, $p < .001$, $\exp(B) = .027$, 95% CI [.004, .205]) and Ph.D. ($\beta = -3.67$, $SE = 1.12$, $p = .001$, $\exp(B) = .026$, 95% CI [.003, .233]) academic degrees. The findings also indicated that high school teachers ($\beta = 1.59$, $SE = .676$, $p = .018$) were more susceptible to experience hopelessness than middle school teachers. The relative risk of experiencing hopelessness in high school teachers was $\exp(B) = 4.93$ (95% CI [1.31, 18.54]) times greater compared to middle school teachers, suggesting a higher risk of hopelessness associated with being a high school teacher.

We also found significant effects of socioeconomic status on the likelihood of experiencing higher levels of hopelessness for teachers with low socioeconomic status ($\beta = 2.15$, $SE = 0.882$, $p = 0.014$). More precisely, the odds of experiencing hopelessness among teachers with low socioeconomic status were quite greater ($\exp(B) = 8.65$, 95% CI [1.53, 38.76]) than teachers with middle ($\beta = 1.34$, $SE = 0.985$, $p = 0.17$) and high socioeconomic status. Similarly, the level of teachers' perceived social support significantly accounted for the variation in hopelessness. Low perceived social support was associated with greater feelings of hopelessness ($\beta = 2.05$, $SE = 0.547$, $p < 0.001$) by increasing the odds of experiencing hopelessness up to 7.78 (95% CI [2.66, 22.72]) times greater than teachers with high perceived social support. Therefore, we may argue that low socioeconomic status and low perceived social support are two important risk factors influencing and increasing the relative risk of experiencing hopelessness feelings.

Furthermore, we performed Kendall's tau-b to understand the significance of the correlation between perceived social support and hopelessness. As expected, the results indicated that perceived social support is negatively associated with hopelessness ($r_t = -0.495$, $p < 0.001$), suggesting that teachers with higher perceived social support are less likely to experience hopelessness feelings. Therefore, it can be argued that hopelessness is associated with contextual support; however, it may require much research and intensive interviews with the participants to determine its effect on teachers' emotions and hopelessness.

Discussion and implications

The results revealed that the teachers in this study experienced a moderate level of hopelessness. Additionally, the study demonstrated seven notable factors significantly associated with hopelessness. In particular, we found that the probability of moderate-to-severe hopelessness was about eight-and-a-half-fold higher when the financial situation was poor, nearly eight-fold higher when perceived social support was low, and about 11-fold higher with the increase in teachers' age. Additionally, we found a negative association between teachers' perceived social support

and hopelessness, which may signify the importance of teachers' emotions and emotional management in dealing with feelings of hopelessness.

Our results regarding a moderate level of experienced hopelessness are in line with previous studies with a general population (e.g., Haatainen et al., 2004; Hamzaoglu et al., 2010) and a university population (Poch et al., 2004). However, the results of the current study could have been affected by the COVID-19 pandemic circumstances, which have multiplied the challenges and stressors that teachers face by giving rise to unprecedented pandemic-specific problems (e.g., isolation and lockdown, social and physical distancing, health concerns, insomnia, loss of employment, income reduction, and emotional upset; see Holman et al., 2020; Baker et al., 2021; Ghasemi et al., 2022). As a result, the prevalence of hopelessness in teachers could have increased, similar to other mental illnesses (e.g., depression), due to the pandemic-related changes and modifications in teachers' lives, teaching, and education.

Furthermore, the results indicated that male teachers were more prone to experience hopelessness feelings than female teachers, which was in line with previous studies (e.g., Haatainen et al., 2004; Lester, 2013). However, there are also some studies reporting no significant differences across gender (e.g., Hamzaoglu et al., 2010; Kocalevent et al., 2017), suggesting inconsistent results for the effects of gender on hopelessness feelings. This inconsistency may be the result of contextual, cultural, and ethnic differences between the study populations. Whether teachers work in middle or high schools was also a significant predictor of hopelessness in teachers. The prevalence of hopelessness was greater for high school teachers, which could be attributed to students' misbehavior and learned helplessness in high schools in Iran (Ghasemi, 2022a). In other words, students' disruptive and aggressive behaviors and lack of learning and achievement may culminate in loss of motivation, helplessness, and negative experiences for teachers, which may, in turn, lead to hopelessness feelings (Au et al., 2009; Chang et al., 2010). We also observed a trend of the increasing prevalence of hopelessness with age, which was consistent with previous studies (e.g., Hamzaoglu et al., 2010; Serin and Doğan, 2021). As age is positively associated with depression symptoms (Beekman et al., 1999; Snowdon, 2001) and psychological distress (Qiu et al., 2020), the probability of experiencing hopelessness may also increase with age due to the high correlation of hopelessness with these mental disorders (Au et al., 2009).

Another significant predictor of hopelessness was teachers' socioeconomic status. The results indicated a greater odds of experiencing hopelessness for teachers with poor socioeconomic status. Our results are consistent with past findings indicating that a higher probability of experiencing hopelessness feelings is associated with people with low socioeconomic status and social class (e.g., Haatainen et al., 2004; Hamzaoglu et al., 2010). Evidence suggests that poor socioeconomic status during the pandemic could result in poor self-reported mental health (e.g., depression, anxiety, and

psychological distress) in adults. As teachers in Iran live on low salaries and struggle to earn their living, their socioeconomic status may have been more complicated due to the lockdown and self-isolation during the pandemic, which may restrict their professional income and increase the odds of experiencing mental health issues.

Similar results were also found for perceived social support, which significantly accounted for variation in hopelessness. It has already been established that perceived social support may filter many psychological risk factors and promote mental health (Lai and Ma, 2016). According to the literature, high perceived social support has the potential to act as a protective factor against hopelessness during the pandemic (Zuo et al., 2021; Ghasemi, 2022b). Therefore, it is reasonable to assume that peer coaching and promoting social support for teachers diagnosed with hopelessness could improve their emotional and behavioral functioning (DeFronzo et al., 2001).

Furthermore, hopelessness could be caused by various sources (e.g., self, family, community, workplace climate, and colleagues), which may prevent or promote hopelessness and pessimism in teachers. If ignored and not properly treated, hopelessness can give rise to anxiety, burnout, depression, loneliness, and even suicidal ideation (Chang et al., 2010; Serin and Doğan, 2021). Therefore, administrators are encouraged to promote academic buoyancy (Huang, 2022), perceived social support (Cakar and Karatas, 2012; Zuo et al., 2021), and functional coping strategies (Ghasemi et al., 2022; Ghasemi, 2022b) to help at-risk teachers cope with hopelessness.

The results of the current study may help counselors, school psychologists, and administrators recognize risk factors related to hopelessness more effectively than earlier. For instance, they may consider those attributes significantly associated with hopelessness in their initial screening of hopelessness in public school teachers to prioritize therapeutic interventions for them. Additionally, the study provides evidence regarding the critical role of social support (e.g., collegial/superior support) and positive school climate as protective factors in alleviating hopelessness feelings. Findings support the expanded hopelessness theory of depression in the pandemic era and highlight the importance of social support by keeping personal relationships with family, friends, and colleagues alive when facing a mass trauma. In light of the presented results of the study, it is recommended that teachers are provided with knowledge of hopelessness, its consequences, and functional coping strategies to either prevent or treat such mental health issues. It is also suggested that collegial and superior support, as well as a positive school climate, should be promoted with the at-risk teachers to maintain their mental health. More importantly, teachers in public schools should also be supported financially, as the poor socioeconomic status may lead to several mental illnesses and diminish their performance.

Due to the significance of the demographic and occupational attributes of teachers in predicting feelings of hopelessness during the pandemic, scale developers may integrate these factors into the

scales associated with teacher well-being to facilitate hopelessness diagnosis and screening. Given the mental and social consequences of the pandemic for teachers (e.g., stress, anxiety, depression, loneliness, and distance working), policymakers should tailor professional development programs in order to equip teachers with the required coping strategies to effectively respond to new emotional and professional demands during the crisis situations.

Limitations

This study also had some limitations. First, the study was limited by its cross-sectional design; thus, causal inferences are not appropriate. Second, the study was limited by utilizing self-report techniques, giving rise to possible concerns regarding shared biases or common method variance. Future research may control common method bias among the scales by implementing a longitudinal design and utilizing qualitative techniques (e.g., behavioral observation and in-depth interview), which may further triangulate and enrich the findings. More importantly, any generalization of the study findings to teachers of other disciplines and contexts should be made cautiously because of the sampling strategy and significant differences between teachers working in the education system in Iran and teachers of other countries. Therefore, further research with other teachers working in western countries, particularly during the pandemic, is required to elaborate on the findings of this study.

Due to the lack of sufficient sample size, we failed to examine the measurement invariance of the BHS scale, which may obscure or bias true associations or differences. Therefore, it is difficult to ascertain that any differences in scale means are due to true differences. Additionally, evidence suggests that the factor structure of the BHS may be distorted due to method effects (Szabó et al., 2016). Flores-Kanter et al. (2022) recommend using the correlated trait-correlated method minus one approach to model the method effect on scales, as it is a powerful approach giving the trait factor an unambiguous meaning and preventing the anomalous results associated with fully symmetrical bi-factor modeling. Future studies may also apply this model to analyze the internal structure of the BHS.

As this study aimed at determining the prevalence of experienced hopelessness in teachers and examining the effects of different demographic and professional attributes on their hopelessness, this study is not sufficient to reveal the causal factors and situations that give rise to experienced hopelessness. Thus, in-depth interviews with teachers could contribute to our understanding of their perspectives by allowing them to describe the current situation in a more comprehensive and detailed way. Future research could be conducted utilizing the mixed-method research design by considering the relationships between hopelessness and different organizational variables such as conflict, burnout, peer relationships, and the teacher–student relationships.

Conclusion

This study explored the prevalence of hopelessness among public school teachers in Iran, resulting in a moderate level of hopelessness. Additionally, the current study investigated the risk factors associated with hopelessness feelings during the COVID-19 pandemic and the effects of various demographic and occupational attributes on the hopelessness situation. The results indicated that all investigated demographic and occupational factors significantly associated with and influenced hopelessness feelings. However, we failed to find any significant association between teachers' education and hopelessness. The results provide information to help counselors, school psychologists, and administrators identify the risk factors associated with teacher hopelessness in public schools in order to develop training programs to prevent hopelessness feelings, diminished performance, and attrition in teachers. Promoting social support and a positive school climate as well as supporting teachers financially during the pandemic could be some potential protective factors to maintain and foster teachers' mental health.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the author, without undue reservation.

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Ethics statement

The studies involving human participants were reviewed and approved by Urmia University. The patients/participants provided their written informed consent to participate in this study.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Burnout Integrative Measure: A preliminary validation among French college students

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The aim of this research was to create and validate an integrative measure of college students' burnout. A burnout measure was proposed and extended the three-dimensional conceptualization of burnout (weariness, detachment toward social objects, inadequacy). Based on prior research, our conceptualization and measure distinguished between types of weariness (cognitive, physical, and emotional weariness) and between different targets of detachment toward social objects (studies, other students, teachers). We also relied on negatively worded items to assess inadequacy, as suggested in the literature. The criterion-related validity of our Burnout Integrative Measure (BIM) was examined by exploring associations with two closely related constructs, namely stress and depression. The participants are 905 students in several disciplinary (psychology, nursing care, medicine, science and techniques in sports and physical activities). Results from structural equation modelling provided support for a third-order model encompassing the different targets of detachment, the distinct types of weariness, and inadequacy. The third-order model had a better fit than a first-order model (with a global burnout) and a second-order model (with no distinction between the targets of detachment and the types of weariness). Correlations with related constructs (depression and stress) mostly confirmed our hypotheses. Results and practical implications are discussed.

KEYWORDS

burnout, students, college, detachment, weariness, inadequacy

Introduction

Burnout was initially described as “a syndrome of emotional exhaustion and cynicism that occurs frequently among individuals who ‘do people-work’ of some kind” (Maslach and Jackson, 1981, p. 99). Maslach and Jackson (1981) identified three dimensions of human service workers' burnout: *emotional exhaustion*, *depersonalization* and *reduced personal accomplishment*. The Maslach Burnout Inventory-Human Services Survey (MBI-HSS; Maslach and Jackson, 1996) was thus developed and validated to measure these dimensions in human service workers. Later, burnout was revealed not to be specific to

human service workers and was refined to be applied to the other workers. Because of this change in scope, symptoms' definitions evolved, as well as their assessment, through a new version of the Maslach Burnout Inventory (MBI). This scale, the MBI-General Survey (MBI-GS, [Schaufeli et al., 1996](#)), assesses the three dimensions of workers' burnout: *exhaustion*, *cynicism* and *a lack of professional efficacy*. *Exhaustion* is not only defined by emotional exhaustion as it was the case for human services workers but takes also into account physical exhaustion ([Maslach et al., 2001](#)). *Cynicism* represents a cold and detached attitude toward work as a whole, not toward recipients as it was the case for the corresponding depersonalization dimension of the MBI-HSS. *A lack of professional efficacy* is defined by feelings of being less effective in one's work, not in one's work with recipients as it was the case for the corresponding personal accomplishment dimension of the MBI-HSS. Note however that this three dimensional conceptualization of burnout, even if largely widespread, is not the only one conceptualization of burnout among workers as it coexist with other conceptualization such as the bidimensional conceptualization of [Halbesleben and Demerouti \(2005\)](#) or more recently the four dimensional conceptualization of [Schaufeli et al. \(2020\)](#).

Although burnout has been described and defined within the professional context, several studies have suggested that it could develop in other contexts which have similarities. Burnout has been studied in the parental context with the maternal burnout syndrome ([Lebert-Charron et al., 2018](#)) and in the academic context ([Schaufeli et al., 2002](#); [Salmela-Aro et al., 2008](#); [Faye-Dumanget et al., 2017](#)). It means that students can also develop burnout. Indeed, just like workers, students are embedded within a social system with classmates instead of colleagues, teachers instead of immediate supervisors, administration (specifically the head of the institution) instead of senior management. Logically, a few tools have been developed to assess burnout within the academic context, including some in the French language, but these tools suffer from some drawbacks, making their use problematic. Therefore, the present research aimed to address these disadvantages by creating and validating a new tool (i.e., the Burnout Integrative Measure, BIM) to assess burnout among French college students. Precisely, this research intended to examine the construct validity of the BIM and to provide preliminary evidence of its criterion-related validity.

Existing measures of student burnout

The Maslach Burnout Inventory-Student Survey (MBI-SS, [Schaufeli et al., 2002](#)) is a direct translation of the MBI-GS to the academic context, with the items referring to work being adapted to refer to studies. Therefore, this scale assesses burnout with the same underlying conceptualization as the one proposed for workers (i.e., exhaustion, cynicism towards studies and reduced efficacy). The MBI-SS has been translated and validated in French ([Faye-Dumanget et al., 2017](#)) among students aged from 18 to 25 years old, thus allowing its use in the academic context. Yet, several MBI tools are copyrighted and thus not openly or easily accessible to researchers and practitioners.

An alternative is the Genoud and Reicherts' Burnout Scale for students (2008), which is an adaption of several MBI versions to the academic context. It also goes further by proposing to distinguish teachers from classmates by considering them as distinct targets of depersonalization. Unfortunately, despite this interesting and promising theoretical development, their study did not allow the authors to validate the scale. Authors explained failing to reach satisfactory results in terms of factorial structure and scale homogeneity ([Genoud and Reicherts, 2008](#)).

To our knowledge, the only other existing tool available in French to assess student burnout is the School Burnout Inventory ([Salmela-Aro et al., 2009](#)), which was translated and validated in French by [Meylan et al. \(2015\)](#). According to [Salmela-Aro et al. \(2008, p.664\)](#), «school burnout is defined along three dimensions: exhaustion due to school demands; cynical and detached attitude towards one's school; and feelings of inadequacy as student». In developing this scale, authors addressed a shortcoming of the MBI-SS, which measures reduced professional efficacy through positively worded items which actually tap into a positive psychological experience. Yet reverse coding positive items does not equal measuring a negative psychological experience such as a burnout symptom. Therefore, in the School Burnout Inventory, the inadequacy dimension (corresponding to the reduced professional efficacy dimension in the MBI-SS) is assessed *via* negatively worded items, thus better reflecting this adverse experience. Unfortunately, the French version was validated among students aged between 13 and 17 years old. As such, this tool has been validated for teenagers and is thus not suitable for older students. It should be noted that a version for older students was developed and validated (i.e., Study Burnout Inventory, [Salmela-Aro and Read, 2017](#)). However, to the best of our knowledge, this scale has not been validated in French.

In sum, although the above reviewed tools present some advantages, they also have some practical, methodological, and theoretical drawbacks. One of them presents a practical limitation, because of restrictions of use (i.e., MBI-SS). The other two have methodological issues either because they could not be psychometrically validated (i.e., the Genoud and Reicherts' Burnout Scale) or because of the population that was used for validation (i.e., the School Burnout Inventory). These tools also raise some theoretical questions in their consideration of the

Abbreviations: BIM, Burnout Integrative Measure; BM1, Burnout Model 1; BM2, Burnout Model 2; BM3, Burnout Model 3; BM4, Burnout Model 4; OS, Other students; TEA, Teachers; STU, Studies; COG, Cognitive; PHY, Physical; EMO, Emotional; INA, Inadequacy; DET OS, Detachment toward other students; DET TEA, Detachment toward teachers; DET STU, Detachment toward studies; COG WEA, Cognitive weariness; PHY WEA, Physical weariness; EMO WEA, Emotional weariness.

dimensions of burnout, which we further develop in the following section.

Beyond existing measures of student burnout: Multidimensionality of the BIM

First, the above-mentioned tools all assess students' general exhaustion (Genoud and Reicherts, 2008; Meylan et al., 2015; Faye-Dumanget et al., 2017). However, other conceptualizations suggest that there are distinctive types of exhaustion as emphasized in Pines and Kafry's (1981) work or, more recently, by Halbesleben and Demerouti (2005). These authors, in line with the MBI framework, confirmed the importance of emotional and physical fatigue, but also mentioned the importance of cognitive or mental fatigue. This distinction between physical, emotional, and mental exhaustion is also present in Shirom and Melamed's (2006) conceptualization of burnout. Yet, to the best of our knowledge, this distinction between different types of exhaustion (i.e., emotional, physical, cognitive) has never been applied to burnout within the educational setting. Nonetheless, the consideration of physical and cognitive weariness, in addition to the most commonly examined emotional exhaustion dimension (i.e., not be able to feeling something), appears of particular relevance when considering students' burnout. Indeed, the academic context is a demanding one: students have to attend classes but also to complete assignments or study for exams during evenings and weekends (Salmela-Aro and Read, 2017). This intensive schedule leaves them with few opportunities for recovery and may thus drain their physical energy to the point where it cannot be restored. As such, physical weariness implies an intense tiredness which does not disappear even with enough sleep and recovery. Moreover, students have to maintain a high level of attention and concentration during classes and homework, and evolve in an evaluative context, which may drain their cognitive energy. Cognitive weariness can thus manifest itself through difficulties of attention and concentration on daily academic tasks. It therefore seems important to distinguish the three above-mentioned types of fatigue which we propose to all label weariness, in order to distinguish from normal fatigue and refer to a more intense and adverse drain of energy, be it cognitive, physical or emotional.

Second, regarding the cynicism/depersonalization dimension, as previously mentioned, tools often only assess one target at a time and this target most often is one's studies. The Genoud and Reicherts' scale (2008) was, in this respect, quite progressive as it assessed different targets of depersonalization (i.e., studies, teachers and classmates). However, considering that the depersonalization/cynicism dimension is a negative and detached attitude (Maslach et al., 2001; Schaufeli et al., 2002), it can thus theoretically express itself toward several types of social objects that are present in one's environment, and that are pertinent as they represent a threat to students' well-being or identity. This distinction between social objects that one can detach themselves

from is consistent with prior research (e.g., Golembiewski et al., 1983; Demerouti et al., 2005; Genoud and Reicherts, 2008) arguing that these distinct targets must be considered to give a more comprehensive overview of cynicism. Given this more general definition, and to consider different types of social objects, in our research this dimension will be called *detachment toward social objects*. Precisely, we conceptualize detachment as the endpoint of one's chronic use of disengagement strategies from one or several targets that are present in their environment, in reaction to threat, especially identity threat (Crocker and Major, 1989; Steele and Aronson, 1995; Lesage et al., 2013). The idea is that the sources of threat would also be the targets of disengagement and thus become the targets of detachment.

Third, the lack of personal accomplishment/reduced self-efficacy dimension of burnout is usually assessed using positively worded items. This can be problematic as suggested by several authors (Bouman et al., 2002) who insist that it is important to distinguish lack of efficacy from inefficacy. Indeed, Bresó et al. (2007, p.472) note that "the relatively strong correlations of the inefficacy scale with both remaining burnout dimensions support the conceptualization of academic burnout as a three-dimensional syndrome constituted by exhaustion, cynicism, and academic inefficacy, instead of (reversed) efficacy." In other words, low or reversed efficacy is not equivalent to the detrimental experience of inefficacy. Indeed, these constructs reflect two distinct psychological experiences: one refers to a lack of positive experience (i.e., reduced self-efficacy), while the other reflects an adverse psychological experience (i.e., inefficacy). To avoid this confusion and to tap more directly into this negative psychological experience, the use of negative statement was chosen in the present research, as it was done in the works of Salmela-Aro et al. (2009). Moreover, to express more fully the content of the items and the negative psychological experience reflected in this dimension, this third dimension was relabelled *inadequacy* in the present research, in line with Salmela-Aro and colleagues (Salmela-Aro et al., 2008; Salmela-Aro and Read, 2017).

In sum, based on previous criticisms addressed to the MBI scales and building upon other theoretical models, modified definitions of the three dimensions of student burnout were proposed and were consequently renamed *weariness*, *detachment toward social objects* and *inadequacy* in order to better reflect their proposed conceptualization. We offered to develop the Burnout Integrative Measure (BIM) to operationalize these new definitions.

Uncovering the BIM's indirect criterion-related validity

The aim of this study was to test the structure of the BIM and to highlight correlations between each subscale. Previous studies highlighted a higher correlation between exhaustion and cynicism than between exhaustion and academic efficacy (Schaufeli et al., 2002; Faye-Dumanget et al., 2017) which is why high correlations between each type of weariness and each target of detachment

were expected. Based on [Bresó et al. \(2007\)](#) and [Maroco et al. \(2014\)](#) who found higher correlations between (emotional) exhaustion, cynicism and (academic) inefficacy than between (emotional) exhaustion, cynicism and (academic) efficacy, strong links between each subscale were expected.

In the present research, the scale's indirect criterion-related validity was tested using depression and perceived stress as correlates because of their importance in the academic domain ([Grebott and Barumandzadeh, 2005](#); [Beiter et al., 2015](#)). Moreover, these variables are known to strongly relate to burnout ([Schaufeli and Enzmann, 1998](#)). Indeed, depression is recognized to be closely and positively related to burnout, in particular to the exhaustion dimension ([Bianchi et al., 2015](#)). As such, a strong relation between depression and weariness and moderate to low relations with the two other dimensions were expected. Stress is also strongly related to burnout, considered by some authors as the principal antecedent of burnout ([Maslach et al., 2001](#)). Therefore, based on previous work, strong relations between stress and different facets of weariness were expected ([Lesage et al., 2013](#)), and moderate relations between stress and the two other dimensions.

Materials and methods

Participants and procedure

Paper and online questionnaire surveys were collected by the first author and two research assistants from 905 French college students, including 587 women (64.86%) and 289 males (31.93%). Twenty-nine participants (3.20%) did not wish to indicate their gender. Students were either in their first year of psychology ($N=256$), of Science and Techniques in Sports and Physical Activities (STAPS, $N=255$), in their second year of nursing school ($N=72$), and in medicine either in their first-year ($N=191$) or later (2nd to 6th year, $N=130$). One participant did not indicate their major. Respondents' mean age was 19.15 ($SD_{Age}=1.74$), the youngest being 17 and the oldest 26. A total of 36 participants (3.98%) did not wish to indicate their age. All were recruited online or during lectures and were assured of the voluntary and anonymous nature of their participation. Out of the 905 surveyed college students who all completed the burnout measure, 328 also completed the perceived stress scale and 256 also completed the depression scale¹. Our study was presented as research on students' feelings about their ongoing studies. This study was considered not to need approval from the institution ethics committee according to local regulations.

¹ The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Measures

Burnout was measured through the 28-item final version of the BIM ($\alpha=0.95$). Based on the literature, a pool of 29 items was created. Twelve items assessed the dimension of detachment toward social objects, 4 for detachment toward other students (OS1 to 4), 5 for detachment toward studies (STU1 to 5) and 4 for detachment toward teachers (TEA1 to 4). Twelve items assessed weariness, 4 for each type of weariness: cognitive (COG1 to 4), physical (PHYS1 to 4) and emotional (EMO1 to 4). Four items assessed inadequacy (INA1 to 4). Their face-validity was tested and then, a principal component analysis was run to test its structure in a prior study with first year students ($N=297$). The results of this preliminary study showed a satisfactory structure of the scale. The factorial analysis (principal component with oblimin rotation) showed 5 distinct factors that explained 57.52% of the total variance. All items loaded on their respective dimension except for EMO3 which loaded on the inadequacy dimension, CAM1 which had a low loading and ETU1 which had a low loading on another dimension). So, ETU1 was deleted for the following study (CAM1 and EMO3 were kept because their formulation was judged adequate). Alphas were all satisfactory, going from .83 to .94. Participants had to indicate their degree of agreement with each statement using a six-point Likert scale ranging from 0 ("Do not agree at all") to 5 ("Totally agree").

Depression was assessed with The Beck Depression Inventory-Fast Screen-France (BDI-FS-Fr), validated by [Alsaleh and Lebreuilly \(2017\)](#). This scale is composed of seven items ($\alpha=0.78$) and does not take the somatic complaints into account. Participants answered using a four-point Likert-type scale.

Perceived stress was assessed with The Perceived Stress Scale-10 ($\alpha=0.83$) validated in French by [Lesage et al. \(2012\)](#). Participants had to indicate how frequently they experienced each statement during the last two weeks using a five points Likert-type scale ranging from 0 ("Never") to 4 ("Often").

Results

Confirmatory factor analyses were run using AMOS version 24 to test the structure of the BIM. Several indices were used to assess model fit such as the chi-square (χ^2), the degree of freedom (df), the Comparative Fit Index (CFI), the Tucker Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA) and the Akaike Information Criterion (AIC).

Four models were tested, covariances between errors were not allowed in these models². The first model had all items

² It was chosen not to allow covariances between errors because of scientific parsimony ([Byrne, 2009](#)), and because, according to Byrne, adding covariances between errors after having tested a model correspond to an exploratory rather than a confirmatory logic ([Byrne, 2009](#), p. 89). Finally, the 'burnout model 4' already have good psychometric properties without allowing covariances between errors.

loading on a burnout latent variable (Burnout Model 1, BM1). One of the items designed to assess detachment toward other students had a low factor loading, therefore this item was removed and a second model was tested. This item was removed in the three other models. The second model was identical to BM1 except that it did not include the problematic item identified in BM1 (Burnout Model 2, BM2). The third model had each item load on its corresponding dimension (detachment, weariness, and inadequacy) as a latent variable, and each dimension load on burnout as second order variable (Burnout Model 3, BM3). The fourth model had each item loading on its corresponding dimension as a latent variable (detachment toward other students, detachment toward teachers, detachment toward studies, cognitive weariness, physical weariness, emotional weariness, and inadequacy), each of the three detachment and the three weariness dimensions loaded on their respective detachment and weariness second order variable. The detachment, weariness, and inadequacy latent variables loaded on a burnout third order variable (Burnout Model 4, BM4). Results from all models are displayed in [Table 1](#) and indicate that BM4 presented the best fit to the data. This model (BM4) was thus retained for subsequent analyses ([Figure 1](#)).

Albeit the low number of participants in each group, an invariance analysis was run according to gender. The difference of χ^2 (571.4; $df = 315$) was significant at $p < 0.001$. However, all indices were still better than those of other models (respectively for women and men, TLI = 0.893 and 0.869; CFI = 0.904 and 0.88; RMSEA = 0.078 and 0.077; AIC = 1551.75 and 977.42). Only the item ENS1 had a lower coefficient among men (0.42).

Correlations between sub-dimensions are presented in [Table 2](#).

The three types of weariness were significantly related to depression (see [Table 2](#)). Physical weariness presented the strongest association with depression ($r = 0.56$), followed by inadequacy ($r = 0.55$), cognitive weariness ($r = 0.53$), emotional weariness ($r = 0.48$), and by the distinct types of detachment toward social objects (from 0.26 to 0.44).

The pattern of results for stress thus appeared to be almost identical to that of depression (see [Table 2](#)). Results showed stress to be moderately to strongly associated with each weariness dimension (ranging from 0.40 to 0.51), with detachment toward

social objects (ranging from 0.24 to 0.34), and with inadequacy ($r = 0.48$).

Complementary analyses were conducted to compare levels of burnout (mean of each symptom) and symptoms of burnout of students according to their discipline and their gender. Anovas highlighted significant differences between students for burnout and for each symptom (see [Table 3](#)). There were also significant differences for detachment toward other students, toward teachers, toward studies, cognitive weariness, physical weariness and emotional weariness (see [Figure 2](#)).

There were also significant differences between gender for all sub-dimensions except for detachment toward teachers (see [Table 4](#)). Means were higher for the female students than for male students.

General discussion

The aim of this research was to create and validate an Integrative Measure of Burnout for college students in the academic context. This measure was developed to assess detachment toward social objects (depersonalization/cynicism), weariness (exhaustion) and inadequacy (reduced professional efficacy), and was underpinned by extended conceptualizations for each dimension.

Theoretical implications

Results from confirmatory factor analyses confirmed our conceptual modelling of detachment toward social objects and weariness, by showing the superiority of a third-order model with weariness, detachment toward social objects and inadequacy as latent variables. Our results therefore confirm the three-component model of burnout. They also highlight the importance to distinguish between distinct forms of detachment (i.e., detachment toward other students, teachers and studies) and between different manifestations of weariness (i.e., cognitive, physical and emotional weariness) which confirms the propositions of [Genoud and Reicherts \(2008\)](#), [Demerouti et al. \(2005\)](#) and [Shirom and Melamed \(2006\)](#).

Correlations between subscales were a little surprising as shown by the low to moderate links between different types of

TABLE 1 Results from confirmatory factor analyses.

	χ^2	df	TLI	CFI	RMSEA	AIC	Comparison model	$\Delta \chi^2$	Δdf
BM1	5061.27	350	0.70	0.72	0.12	5173.27			
BM2	4951.18	324	0.71	0.73	0.13	5059.18	BM1 vs. BM2	110.09**	26
BM3	3544.48	321	0.79	0.81	0.11	3658.48	BM2 vs. BM3	1406.70**	3
BM4	1853.24	315	0.90	0.91	0.07	1979.24	BM3 vs. BM4	1691.24**	6

CFI = Comparative Fit Index; TLI = Tucker-Lewis fit Index; RMSEA = Root Mean Square Error of Approximation; AIC = Akaike Information Criterion; $\Delta \chi^2$ = Chi-square difference; Δdf = degree of freedom difference; BM1 = Burnout Model 1; BM2 = Burnout Model 2; BM3 = Burnout Model 3; BM4 = Burnout Model 4. ** $p < 0.01$.

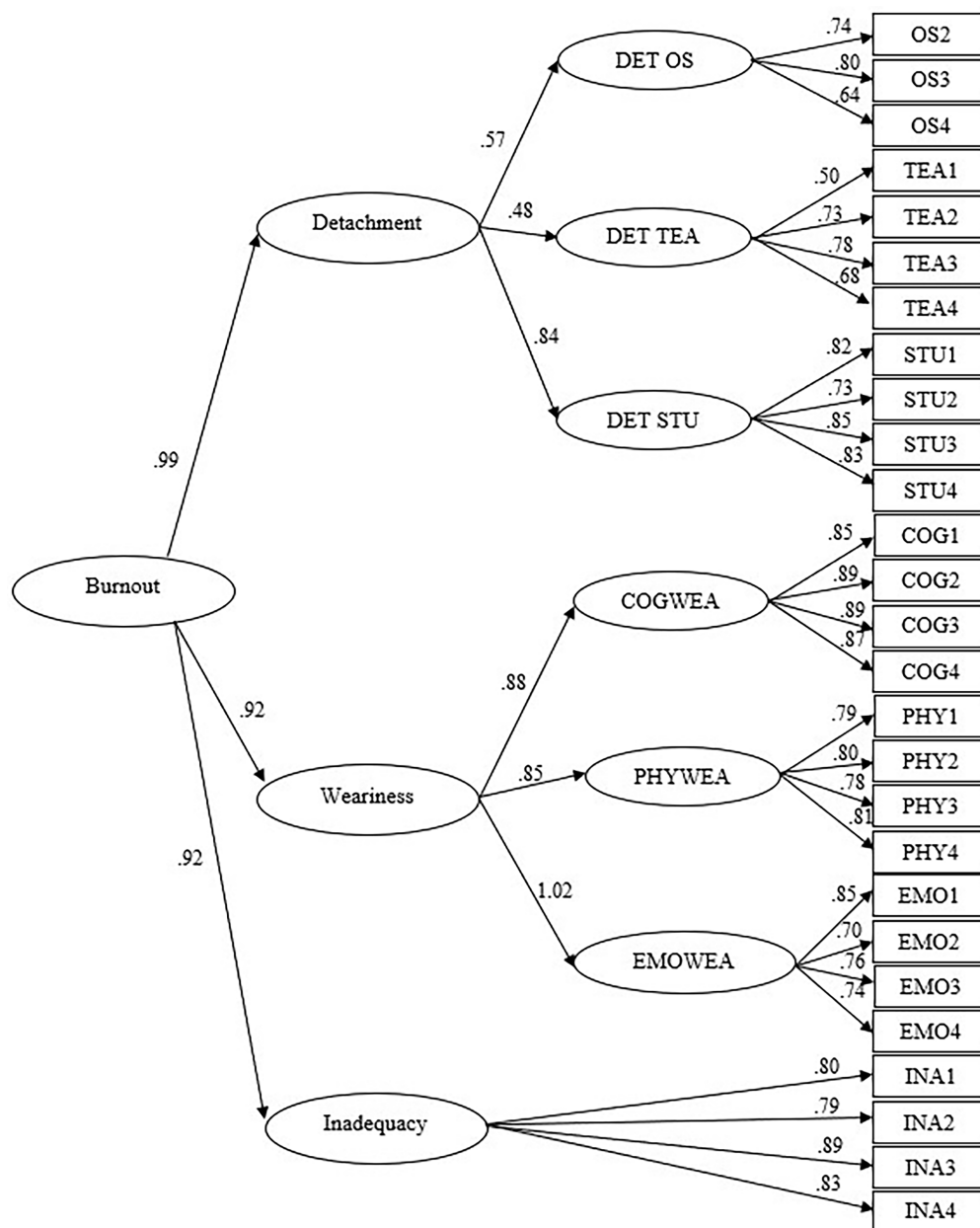


FIGURE 1

Burnout Model 4 (BM4). OS=Other students; TEA=Teachers; STU=Studies; COG=Cognitive; PHY=Physical; EMO=Emotional; INA=Inadequacy; DET OS=Detachment toward other students; DET TEA=Detachment toward teachers; DET STU=Detachment toward studies; COG WEA=Cognitive weariness; PHY WEA=Physical weariness; EMO WEA=Emotional weariness. All links are significant. OS1 was removed after the analysis of BM1.

detachment toward social objects. It seems that a student can be detached from teachers but not necessarily from other students. However, they were in line of those found by [Demerouti et al. \(2005\)](#) in the professional context.

Results showed that, while detachment toward other students and toward teachers were moderately linked with all other dimensions of burnout, detachment toward studies was strongly linked to most of them (i.e., cognitive and emotional weariness, and inadequacy). This means that when a student is detached

from his studies, he could also present difficulties to concentrate on tasks, feel emotional drain and think that he is incompetent. Inadequacy was strongly correlated to cognitive and emotional weariness while being moderately correlated with the most of the other dimensions of burnout. These results are similar to those of [Faye-Dumanget et al. \(2017\)](#) who found academic efficacy to be strongly linked with cynicism (toward studies). However, our results showing moderate to high correlations for weariness differed from those of [Faye-Dumanget et al. \(2017\)](#) who found

TABLE 2 Correlations between variables.

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Detachment toward OS	1.40	1.35	–								
2. Detachment toward TEA	0.92	0.93	0.24	–							
3. Detachment toward STU	0.77	1.11	0.43	0.43	–						
4. Cognitive weariness	1.94	1.48	0.40	0.46	0.56	–					
5. Physical weariness	2.11	1.54	0.42	0.45	0.48	0.73	–				
6. Emotional weariness	1.32	1.29	0.49	0.46	0.68	0.79	0.76	–			
7. Inadequacy	1.39	1.39	0.47	0.39	0.69	0.69	0.60	0.75	–		
8. Depression	0.46	0.46	0.41	0.26	0.44	0.53	0.56	0.48	0.55	–	
9. Stress	1.77	0.73	0.34	0.24	0.34	0.46	0.51	0.40	0.48	0.60	–

OS = Other students; TEA = Teachers; STU = Studies. Variables 1 to 7 ranging from 0 to 5, depression ranging from 0 to 3 and stress from 0 to 4.

TABLE 3 Comparison of burnout levels and burnout symptoms levels of students who come from several disciplinary (LSD test).

Variable	<i>M(SD)</i> psychology	<i>M(SD)</i> STAPS	<i>M(SD)</i> nursing	<i>M(SD)</i> medicine (first year)	<i>M(SD)</i> medicine (>first year)	<i>F</i> (4,899)
Detachment toward OS	1.35a (1.28)	0.93b (1.14)	1.18a, b (1.29)	2.14c (1.41)	1.49a (1.34)	25.38**
Detachment toward TEA	0.46a (0.55)	0.71b (0.72)	1.43c (0.97)	1.03d (0.86)	1.84e (1.12)	76.31**
Detachment toward STU	0.46a (0.86)	0.51a (0.84)	0.54a (0.86)	1.24b (1.44)	1.31b (1.16)	28.62**
Detachment	0.76a (0.67)	0.72a (0.67)	1.05b (0.63)	1.47c (0.99)	1.55c (0.92)	46.94**
Cognitive weariness	1.13a (1.09)	1.38b (1.15)	1.90c (1.26)	3.31d (1.24)	2.67e (1.43)	116.09**
Physical weariness	1.43a (1.19)	1.21b (1.07)	2.43c (1.38)	3.35d (1.32)	3.22d (1.36)	130.19**
Emotional weariness	0.66a (0.85)	0.76a (0.90)	1.21b (1.04)	2.54c (1.31)	2.00d (1.21)	122.58**
Weariness	1.08a (0.91)	1.12a (0.89)	1.85b (1.06)	3.07c (1.13)	2.63d (1.19)	158.76**
Inadequacy	0.96a (1.06)	0.86a (1.03)	1.14a (1.25)	2.46b (1.55)	1.84c (1.40)	60.56**
Burnout	0.93a (0.78)	0.90a (0.75)	1.34b (0.80)	2.33c (1.08)	2.01d (1.03)	107.03**

OS = Other students; TEA = Teachers; STU = Studies. For each line, the use of the same letter indicates that there is not a significant difference between the groups. ** $p < 0.01$.

weak correlation between academic efficacy and exhaustion. One of the reasons may lay in the negative wording of the inadequacy scale compared to the positive wording of academic efficacy scales. Indeed, [Bresó et al. \(2007\)](#)'s study also presented stronger correlations between exhaustion and cynicism when they used an inefficacy scale rather than an efficacy measure.

Correlations with other constructs were in the expected direction except for inadequacy which showed higher correlations than expected with stress and depression. More precisely, the more students are stressed, the more they feel cognitive and physical weariness as well as inadequacy. The more they feel depressed, the more they feel cognitive, emotional, and physical weariness as well as inadequacy. Once again, one explanation of our results could lay in our studying inefficacy (i.e., an adverse experience) rather than reduced efficacy (i.e., lack of a positive experience). Future studies should thus further investigate the relationship between inadequacy, depression and stress among students to confirm their strong links.

Finally, the difference between students' levels on inadequacy is in line with the results found by [Faye-Dumanget et al. \(2018\)](#)

except for the first-year students in medicine. Regarding the other dimensions, they did not find differences for exhaustion and cynicism, while in the present research, we did find such differences. Maybe it could be explained by the use of different tools or the population under study (university and prep school for Faye-Dumanget et al., and almost only university students for this study). Our results also highlight the pertinence of distinguishing targets of detachment. Indeed here, students from different majors did not detach from the same targets. While advanced students in medicine detached themselves from teachers, this was not the case of first year students who instead presented a detachment from other students. This may be explained by the very high numbers of students in the first year of medicine coupled with the competition climate that is often the rule within this discipline. So, these results show the importance of distinguishing between targets of detachment that seem to reflect the specific reactions to their personal experience of studies within their domain.

In sum, our results showed satisfactory psychometric properties of the Burnout Integrative Measure. This new measure

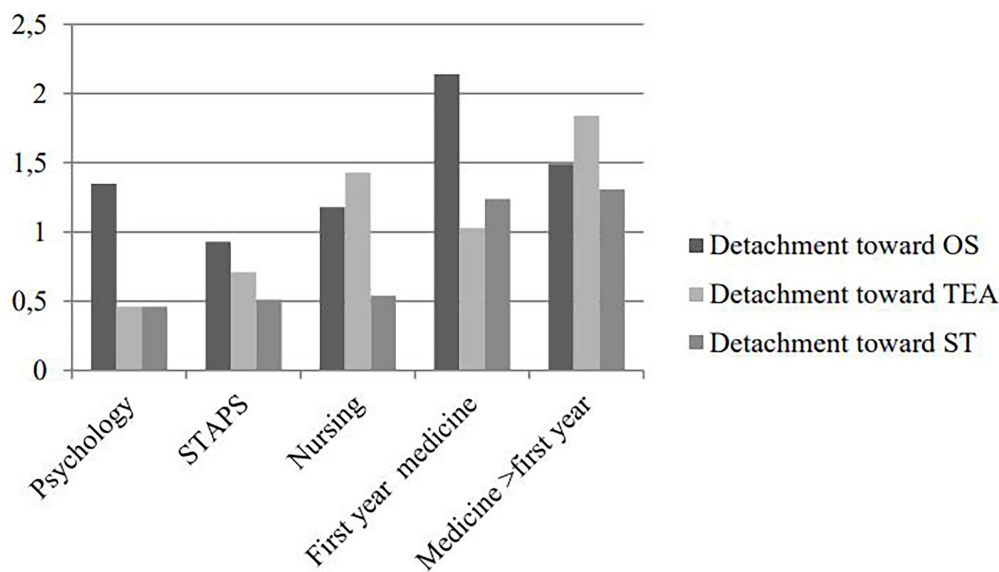


FIGURE 2
Means of detachment toward other students, toward teachers and toward studies for each disciplinary.

TABLE 4 Comparison of burnout (sub-)dimensions means between genders.

Variable	<i>M(SD) female</i>	<i>M(SD) male</i>	<i>t(874)</i>
Detachment toward OS	1.53 (1.37)	1.82 (1.29)	3.59**
Detachment toward TEA	0.92 (0.96)	0.97 (0.87)	−0.70
Detachment toward STU	0.83 (1.17)	0.64 (0.96)	2.37*
Detachment	1.09 (0.89)	0.93 (0.79)	2.64**
Cognitive weariness	2.15 (1.54)	1.58 (1.29)	5.36**
Physical weariness	2.45 (1.57)	1.47 (1.28)	9.21**
Emotional weariness	1.49 (1.38)	1.02 (1.06)	5.13**
Weariness	2.03 (1.38)	1.35 (1.07)	7.27**
Inadequacy	1.58 (1.48)	1.01 (1.13)	5.81**
Burnout	1.57 (1.13)	1.10 (0.89)	6.20**

OS = Other students; TEA = Teachers; STU = Studies. ** $p < 0.01$; * $p < 0.05$.

is composed of three subscales (i.e., weariness, detachment toward social objects, and inadequacy) representing the three symptoms of burnout. Our measure extends upon prior conceptualizations by 1) distinguishing between targets of detachment as suggested by some authors (e.g., Genoud and Reicherts, 2008); 2) differentiating between three types of weariness (i.e., emotional, cognitive, and physical) and, by doing so, integrating crucial information from the Shirom-Melamed Burnout Measure (Shirom and Melamed, 2006) and making it complementary with the MBI approach, and 3) negatively wording the inadequacy items, in order to better tap into the adverse experience that it

represents, whereas prior work considered this dimension as lack of a positive experience (Schaufeli et al., 2002). As such, our work extends upon prior research on students' burnout and contributes to bridge the gap between opposite, yet popular, approaches of burnout (Maslach and Jackson, 1981; Maslach et al., 1996; Shirom and Melamed, 2006).

Limitations and research perspectives

Despite its contribution to the literature on student burnout, this research presents some limitations. First, the validity of the BIM for College Students was not compared to other scales assessing student burnout in French. Yet, it should be noted that this choice was motivated by the limitation of the use of MBI (i.e., copyrighted) and by the population in which the School Burnout Inventory was validated (i.e., young adolescents). Depression was used to test indirect criterion validity in reference to the debate in the literature about the proximity of the two concepts (Bianchi et al., 2015; Parker and Tavella, 2021). It is important to note however that many studies showed that depression, at least among employees, is more a consequence of burnout than a component (because of its links with exhaustion/weariness). It is then important to explore more fully, using a longitudinal design, how burnout, measured with the BIM, can predict depression and/or it is a component of burnout.

Second, data were collected at the beginning of the first semester for students in psychology, STAPS and nursing and at the second semester for medicine students. Maricuțoiu and Sulea's study (2019) highlighted that levels of burnout increase during the

second semester. The time of data collection could explain why medical students had the highest level of burnout. Indeed, the first semester for first-year students is the beginning of students' academic journey so their identification and relationships with others and teachers may not have had the time to fully develop. That is why further studies are needed to test levels of burnout from students in medicine and in other disciplinary at a single time point.

Third, this preliminary validation study does not provide cut-off scores. Indeed, several studies are needed to get cut-off score because the population must be the most representative of all students.

Finally, other studies may be necessary to adapt it to other contexts such as the work domain (e.g., Huyghebaert et al., 2018) and explore its criterion validity with other burnout measures validated and available in French such as the Burnout Assessment Tool (Schaufeli et al., 2020), the Burnout Measure Short version (Malach-Pines, 2005; Lourel et al., 2007) to cite a few. They are however less precise than our tool which assess in a same tool all sub dimensions. It would be also interesting to explore relations between our burnout measure and various antecedents and consequences that have already been identified in the literature in order to extend its nomological network.

Practical implications

Despite these limitations, the creation and validation of the BIM for College Students could be useful to both practitioners and researchers. Indeed, it is not under copyright and thus easily accessible by all. To our knowledge, this is the first measure to simultaneously assess several targets of detachment and several types of weariness among college students. These distinctions could allow for a more precise representation of students' burnout. Indeed, when focusing only on detachment toward studies as it is the case in the existing tools, information about relationships with other students and/or with teachers are missing. To only focus on studies does not allow getting information about their relation with other interpersonal targets (i.e., other students, teachers). However, this type of information is also important because other students and teachers are an important part of students' environment.

The BIM for College Students could be an interesting tool for practitioners as they could adapt the prevention of burnout depending on the dimensions that students score the highest on. If students score high on all dimensions of burnout, practitioners could interview, counsel and assist them to avoid their dropping out of college. This latter point represents a huge implication for both students and the educational system. Finally, this tool could not only allow for the replication in the academic context for results found in the work context but also highlight specific causes or consequences specific of this academic context. Indeed, if we know of the numerous deleterious effects of school burnout such as cognitive detriment, low academic performance, risky behaviors or

dropout (Meier and Schmeck, 1985; Bask and Salmela-Aro, 2013; Walburg et al., 2014), we do not know their links with the different kinds of detachment. A better knowledge of those links might, again, allow a better prevention.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

Author contributions

TW and SB contributed to studies conception and were in charge of data collection and statistical analyses. TW, SB, and TH-Z contributed to writing the first draft of the manuscript and approved the submitted version. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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How physical exercise impacts academic burnout in college students: The mediating effects of self-efficacy and resilience

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Background and aims: Academic burnout is harmful to college students, their institutions of learning, and society at large. While research has shown that physical exercise may be associated with reduced academic burnout, the underlying mechanisms require further exploration. This study explored the relationship between physical exercise and academic burnout in a sample of college students, with a focus on the serial mediating roles of self-efficacy and resilience.

Methods: This study adopted a cross-sectional survey approach among a sample of undergraduate college students in China. We recruited 1,270 participants in the second half of the 2021–2022 academic year (476 men and 794 women), all of whom completed questionnaires containing the Physical Activity Rating Scale, Academic Burnout Scale for College Students, 10-item General Self-Efficacy Scale, and 25-item Connor-Davidson Resilience Scale. We then subjected the collected data to a series of statistical analyses.

Results and conclusion: Physical exercise was significantly and negatively associated with academic burnout and its three subfactors (i.e., emotional exhaustion, improper behavior, and low personal achievement). Participants in the high physical exercise group showed lower levels of academic burnout than those in the moderate and low physical exercise groups. Finally, our serial mediation model showed that physical exercise had a significant direct effect on academic burnout ($\beta = -0.1104$, 95% CI = $[-0.1421, -0.0791]$) in addition to significant indirect effects on academic burnout via self-efficacy and resilience ($\beta = -0.0802$, 95% CI = $[-0.1088, -0.0527]$); the more exercise participation, the lower the academic burnout among college students. These findings suggest that physical exercise is an important interventional target when aiming to reduce academic burnout.

KEYWORDS

academic burnout, college, physical exercise, resilience, self-efficacy

Introduction

Academic burnout is an extreme form of maladjustment to school education that negatively impacts students at all academic levels (Romano et al., 2021). It is more specifically defined as a psychological and behavioral disorder that occurs when students are disinterested in learning or lack the motivation to learn, and may thus emerge as emotional exhaustion, disengagement from learning, and low personal achievement (Schaufeli et al., 2002; Lian et al., 2005). As a result, academic burnout can seriously impact academic performance, physical health, and mental health, and is even known as a precursor to depression (May et al., 2015; Lee and Lee, 2018; Aghajani Liasi et al., 2021). Moreover, the condition is particularly problematic for college students, as it may eventually lead to professional burnout, which can threaten the healthy development of employment across society (Robins et al., 2018). Taken together, these issues highlight the need for continued research aimed at preventing and alleviating academic burnout, thus avoiding damage at the individual, institutional, and societal levels.

Previous studies have referred to two strategic goals to prevent or alleviate academic burnout in college students. One is to develop positive individual qualities, such as optimism and grit (Vizoso-Gomez et al., 2019; Ozhan, 2021), while the other is to enhance resources that are provided by the family, school, and society (Salmela-Aro and Upadyaya, 2017; Trigueros et al., 2020; Ye et al., 2021). Although these studies widely discussed the relationships between stress, negative emotions, maladjustment, and academic burnout (Lin and Huang, 2014; Merhi et al., 2018; Vinter et al., 2021), none have simultaneously examined the relationships among physical exercise, self-efficacy, resilience, and academic burnout, which are thus focal points in this study.

The term “physical exercise” refers to physical activity that is accomplished at a certain intensity, frequency, and duration, with the aim of benefitting physical and mental health (Pan et al., 2021). Such engagement not only helps individuals achieve positive changes in physicality and mood, but also reduces their physiological sensitivity to stress (Sani et al., 2016; Gerber et al., 2017; Mikkelsen et al., 2017) while increasing academic performance and facilitating social adjustment (Ji and Zheng, 2021; Wunsch et al., 2021). As each of these gains can reduce academic burnout, some studies have directly investigated the impacts of physical exercise. For example, one study found that vocational students who completed the recommended level of moderate-to-vigorous physical activity reported fewer symptoms of burnout (Gerber et al., 2015), while another study found that only vigorous physical activity was associated with reduced burnout (Elliot et al., 2015). There is also evidence that suggests that signs of burnout among Brazilian university students are significantly and negatively associated with physical activity (De Souza et al., 2021). However, there is still a lack of data on these issues in the college student population, with no such evidence in the Chinese context. As such, this study examined how physical exercise

affected academic burnout in a sample of Chinese college students, as outlined in the following hypothesis:

H1: Physical exercise would be negatively associated with academic burnout in college students.

Although it is possible that physical exercise can directly reduce academic burnout, it is important to consider whether other variables mediate the process in which this occurs. Indeed, previous research has concluded that self-efficacy plays an important mediating role in the relationship between physical exercise and mental health in college students (Jiang et al., 2017). More specifically, self-efficacy refers to an individual's perceptions or beliefs about their own ability to act appropriately when faced with difficult situations or new circumstances (Schwarzer et al., 1997). Under the relevant theoretical framework (Bandura et al., 1999), good physical and mental states motivate individuals to establish self-efficacy, which may therefore be enhanced through physical exercise, given its positive effects on both physical and mental health. For example, there is evidence that college students who regularly participate in physical exercise have higher levels of self-efficacy (Joseph et al., 2014). At the same time, self-efficacy affects individual thinking patterns and sensory responses (Bandura et al., 1999). In this regard, students with high self-efficacy are typically more able to choose appropriate strategies in times of failure or academic stress, thus reducing the intensity of any academic burnout symptoms (Rahmati, 2015; Luthfia et al., 2021). We therefore posited the following hypothesis:

H2: Self-efficacy would mediate the relationship between physical exercise and academic burnout in college students.

Resilience is often mentioned in conjunction with self-efficacy when discussing how individuals can improve their ability to cope with adversity. In this context, resilience refers to the characteristics, processes, and outcomes by which individuals are able to cope with adversity and eventually return to a positive state (Connor and Davidson, 2003; Fletcher and Sarkar, 2013; Robertson et al., 2015). There is existing evidence that resilience may play an important role in limiting academic burnout, as it is negatively associated with emotional exhaustion and moderates the relationship between academic burnout and perceived mental health in college students (García-Izquierdo et al., 2018). Meanwhile, physical exercise appears to be a significant predictor of resilience, as it strengthens an individual's physical structure and thus provides support during psychological struggles in times of difficulty (Sahin et al., 2012; Seçer, and Çakmak yildizhan, 2020). Based on this, we posited the following hypothesis:

H3: resilience would mediate the relationship between physical exercise and academic burnout in college students.

Although the literature suggests that self-efficacy and resilience independently influence the relationship between

physical exercise and academic burnout, these factors may also be linked together. Indeed, many studies have focused on this connection. For example, self-efficacy positively predicts resilience, it is an important characteristic in differentiating resilience levels among adolescent students (Hamill, 2003). There is also evidence that self-efficacy both promotes the development of resilience and mediates the effects of other positive factors on resilience (Sabouripour et al., 2021). In addition, increased resilience helps college students academic tasks, engage in professional practice, and develop well-being, thereby reducing the risk of academic burnout (Chow et al., 2018). As such, it is reasonable to suggest that physical exercise can influence resilience by affecting self-efficacy, which then affects academic burnout, as outlined in the following hypothesis:

H4: Self-efficacy and resilience would play serial mediating roles in the relationship between physical exercise and academic burnout in college students.

Demographic variables (e.g., gender, age, grade level, degree subject, academic year) have been of interest in prior research on academic burnout (Aguayo et al., 2019). In particular, gender has received attention because there are no consistent results from the academic community regarding whether there are gender-related differences in academic burnout among college students (Onuoha and Akintola, 2016). Therefore, this study included gender variables in the relationship between physical exercise and academic burnout. In sum, we established a hypothetical serial mediation model with physical exercise set as the independent variable, academic burnout set as the dependent variable, and self-efficacy/resilience set as mediating variables. Using this framework, we investigated various effects and mechanisms in the relationship between physical exercise and academic burnout, thus providing a practical basis for solving relevant problems. In this regard, we hope that our findings will motivate college campus administrators to help students adopt strategies that promote physical exercise.

Materials and methods

Participants and procedure

We used a cross-sectional survey method to collect data from university students. In general, under China's key university system, differences have been noted in the mental health changes experienced by students attending key and regular universities (Xin et al., 2012; Feng, 2022). We were aware that this may lead to a difference in the prevalence of academic burnout among students at these different types of universities. To take this into account in the sample selection process, we conducted surveys at one key university and one regular university in Chongqing, and four physical education course classes per grade in each university were randomly selected. In March 2022, when all participants

were in the second half of the 2021–2022 academic year, we sent requests to the lecturers of the prospective participants' classes, inviting the lecturers to assist us in recruiting participants from their classes. We sent detailed information about the purpose of the study to the lecturers who relayed this to the students in their classes.

A total of 1,400 undergraduate students agreed to participate in our study and 1,345 questionnaires were returned, with a response rate of 96.07%. In each case, the questionnaires completed by the participants took approximately 10 min to finish. After we excluded incomplete questionnaires and outliers, the final study included a sample of 1,270 (94.42%), 638 from key universities and 632 from regular universities (476 men and 794 women; 403 social science majors, 867 natural science majors; 338 freshmen, 333 sophomores, 308 juniors, and 291 seniors). All participants provided informed written consent, and were compensated with 2 RMB. The survey protocol was authorized by the Southwestern University Human Ethics Committee (approval no. 20220304C1), and adhered to the Helsinki Declaration of Ethical Standards.

Materials

Physical exercise

We investigated physical exercise *via* the revised Physical Activity Rating Scale (PARS-3; Liang, 1994), which has been widely used to measure the level of physical exercise in the Chinese population and shown to have sufficient validity (Lin and Chai, 2019). The scale has three items that measure exercise intensity, exercise frequency, and single exercise time respectively, each of which is divided into five levels and scored on a scale ranging from 1 to 5. According to Liang's recommendations, physical exercise score = exercise intensity score \cdot (exercise time score $- 1$) \cdot exercise frequency score. The score interval is from 0 to 100 points and can be divided into three criteria to describe the different levels of physical exercise: low physical exercise ≤ 19 points, medium physical exercise 20–42 points, and high physical exercise ≥ 43 points (Liang, 1994). As the scale could not be tested for consistency, we arranged the three items at the beginning and end of each questionnaire to test for reliability, and then removed all unreliable questionnaires (e.g., those containing inconsistent information).

Academic burnout

We measured academic burnout *via* the Learning Burnout Scale for College Students (Lian et al., 2005), which assesses three factors, including emotional exhaustion ("I felt exhausted after learning for a whole day"), improper behavior ("I rarely organized my study time"), and low personal achievement ("I have the ability to get my bachelor's degree"; reverse scored). The scale contains 20 total items that are rated on a 5-point Likert-type scale ranging from 1 (*totally disagree*) to 5 (*totally agree*). Total scores may therefore range from 20 to 100, with higher scores indicating

higher academic burnout. In this study, the scale was internally consistent based on a Cronbach's alpha value of 0.894.

Self-efficacy

We measured self-efficacy *via* the Chinese version of the General Self-Efficacy Scale (GSES; Zhang and Schwarzer, 1995), which focuses on self-confidence when facing difficulty (e.g., “I can always find a solution to a problem when I am faced with it”). The GSES contains 10 total items that are rated on a 4-point Likert-type scale ranging from 1 (*totally disagree*) to 4 (*totally agree*), with higher scores indicating higher self-efficacy. In this study, the Chinese version of the GSES was internally consistent based on a Cronbach's alpha value of 0.917.

Resilience

We measured resilience *via* the Chinese version of the 25-item Connor-Davidson Resilience Scale (CD-RISC; Yu and Zhang, 2005), which contains three dimensions, including toughness (“I do not let failure get me down easily”), strength (“I'm proud of my accomplishments”), and optimism (“I try to look at the humorous side of things when faced with a problem”). The items are rated on a 5-point Likert scale ranging from 1 (*totally disagree*) to 5 (*totally agree*). In this study, the Chinese version of the CD-RISC was internally consistent based on a Cronbach's alpha value of 0.956.

Statistical analyses

We conducted our analyses using IBM SPSS 26.0 and Process 3.5 macros for SPSS. First, we tested the normality of the sample data and then analyzed the means and standard deviations of each variable to determine if they were demographically different. Second, we tested the relationships between all variables *via*

Pearson's bi-variate correlation analysis. Third, we set physical exercise as a categorical variable (low, medium, and high) according to the criteria of the PARS-3 scale (Liang, 1994), and then analyzed academic burnout for each genders in these three physical exercise groups using ANOVA and independent samples t-tests. Finally, we used Model 6 of the Process 3.5 macros for SPSS to test the multiple mediation model. We applied bootstrapping with coefficients estimated from 5,000 bootstraps to compute the direct effect and indirect effect. In cases where the 95% bias-corrected confidence interval (CI) did not include zero, the effect was significant (Hayes, 2017). We verified the efficacy of each analysis based on the effect sizes of the respective results using the G*Power 3.1 post-hoc power analysis (Faul et al., 2009).

As recommended in previous research (Podsakoff et al., 2003), we used the Harman's single-factor test to investigate the potential for common method bias. The unrotated principal component factor analysis showed that there were seven factors with eigenvalues greater than 1; the first factor explained 36.17% of the variance. Thus, the study questionnaire was not seriously affected by common method bias.

Results

The relationships between physical exercise, self-efficacy, resilience, and academic burnout

The absolute values of skewness for all four variables were less than 2, while the absolute values of kurtosis were less than 7; thus, the data were approximately normally distributed (Kline, 2015). Table 1 shows the means (standard deviations) of physical exercise, self-efficacy, resilience, and academic burnout in the

Table 1 Mean (SD) of physical exercise, self-efficacy, resilience, and academic burnout and the differences between these variables and demographic variables.

Variables		Physical exercise	Self-efficacy	Resilience	Academic burnout
Total	Mean(SD)	21.76(22.06)	28.76(5.21)	93.07(15.03)	54.58(11.97)
	Skewness	1.14	−0.15	−0.77	−0.20
	Kurtosis	0.32	0.13	1.76	−0.46
Gender	Male	29.99(24.49)	29.92(5.55)	95.32(16.60)	54.21(13.09)
	Female	16.82(18.82)	28.07(4.86)	91.73(13.84)	54.80(11.24)
	t value	10.08***	6.03***	3.97***	−0.82
Grade	Freshman	16.93(16.81)	28.59(4.72)	94.46(14.20)	54.91(10.85)
	Sophomore	19.68(20.64)	28.34(4.64)	93.53(13.39)	53.78(11.21)
	Junior	23.15(23.11)	28.82(5.50)	92.03(15.91)	55.56(12.19)
	Senior	28.27(25.91)	29.41(5.95)	92.04(16.63)	54.08(13.74)
	F value	15.76***	2.37	2.02	1.43
Major	Social sci.	24.04(24.52)	28.87(5.68)	92.25(17.11)	53.65(12.40)
	Natural sci.	20.70(20.75)	28.71(4.98)	93.45(13.95)	55.01(11.74)
	t value	2.37*	0.48	−1.23	−1.88

*** $p < 0.001$.

* $p < 0.05$.

study sample, as well as their differences in demographic variables. All variables showed significant gender-related differences except academic burnout; among college students of different grades and different majors, there were no significant differences in all variables except physical exercise. Table 2 shows the results of the correlation between all variables. We found significant positive correlations between physical exercise, self-efficacy, and resilience. Academic burnout and its three subfactors were significantly and negatively related to physical exercise, self-efficacy, and resilience. In the relationships between physical exercise and the three subfactors of academic burnout, low personal achievement had the highest correlation, respectively followed by emotional exhaustion and improper behavior. In addition, low achievement was strongly correlated with self-efficacy and resilience, while improper behavior and emotional exhaustion showed relatively weak correlations with these factors. The power value for this analysis was 1 ($p_{H1_{min}} = -0.24$, $\alpha = 0.01$).

To further explore the effects of different physical exercises on academic burnout, we compared the mean value of academic burnout in the physical exercise (low, medium, and high) groups, and tested for differences in this effect across genders. As shown in Table 3, there were significant differences in academic burnout among total, male, and female college students across the different physical exercise groups. Post-hoc tests showed statistically

significant differences between the groups except for the medium exercise group and the high exercise group of male students. The mean values of academic burnout are arranged from low to high, as follows: high physical exercise group < medium physical exercise group < low physical exercise group. There was a significant gender-based difference in academic burnout between the low and high exercise groups. The power value for the above analysis was 1 (effect size $f_{min} = 1.038$, $\alpha = 0.01$).

Mediated model: The effects of physical exercise on academic burnout

With physical exercise set as the independent variable, academic burnout set as the dependent variable, and self-efficacy/resilience set as mediating variables, we tested the serial mediation model for the total sample and across genders sample *via* Process 3.5. In both the overall sample and female sample (Figures 1–2; Table 4), physical exercise not only had a significant negative direct effect on academic burnout, but also had a significant negative indirect effect on academic burnout through three pathways: indirect path 1 (physical exercise → self-efficacy → academic burnout), indirect path 2 (physical exercise → resilience → academic burnout), indirect path 3 (physical exercise → self-efficacy → resilience → academic burnout). In the male sample (Figure 3; Table 4), physical exercise had a significant negative direct effect on academic burnout and a significant negative indirect effect on academic burnout only through self-efficacy. The power value was 1 ($\alpha = 0.05$) for the direct path and indirect path 1; the power value of indirect path 2 was less than 0.296 ($\alpha = 0.5$).

Discussion

The results of this study demonstrate that there is no significant difference in academic burnout between male and female college students, which aligns with existing studies reporting that academic burnout is not influenced by gender (Lin and Huang, 2014; May et al., 2015). In this study, we found that

Table 2 Correlation coefficients between the study variables.

Variables	1	2	3	4	5	6
1 Physical exercise	1					
2 Self-efficacy	0.43**	1				
3 Resilience	0.37**	0.78**	1			
4 Academic burnout	-0.41**	-0.54**	-0.53**	1		
5 Emotional exhaustion	-0.33**	-0.31**	-0.24**	0.89**	1	
6 Improper behavior	-0.28**	-0.40**	-0.42**	0.88**	0.71**	1
7 Low personal achievement	-0.38**	-0.72**	-0.77**	0.62**	0.25**	0.43**

** $p < 0.01$.

Table 3 Comparison of mean (SD) of academic burnout among college students in different physical exercise groups.

Variables	Gender			Total
	Male	Female	t value	Mean(SD)
Low physical exercise	59.93(10.95)	57.62(9.93)	2.82**	58.25(10.26)
Medium physical exercise	50.80(12.44)	50.12(11.04)	0.44	50.44(11.69)
High physical exercise	48.66(13.10)	44.98(10.95)	2.45*	47.18(12.39)
F value	45.70***	74.86***	-	118.42***
Post-hoc	[L – M]***[L – H]***	[L – M]***[L – H]***[M – H]**	-	[L – M]***[L – H]***[M – H]***

Independent variable: academic burnout. [L – M]: Low physical exercise and Medium physical exercise. [L – H]: Low physical exercise and High physical exercise. [M – H]: Medium physical exercise and High physical exercise.

*** $p < 0.001$.

** $p < 0.01$.

* $p < 0.05$.

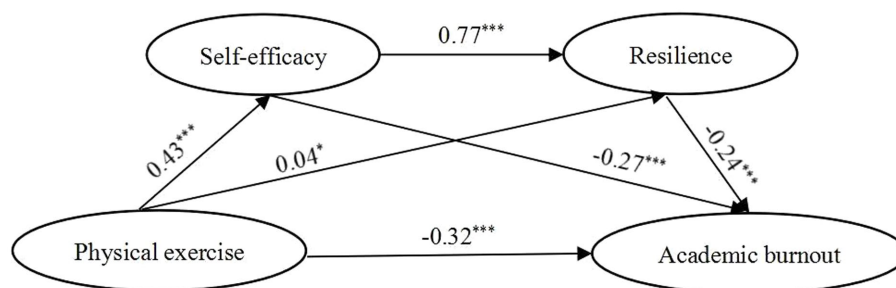


FIGURE 1

Model showing the mediating roles of self-efficacy and resilience in the relationship between physical exercise and academic burnout (Total sample). *** $p < 0.001$, * $p < 0.05$; significant standardized regression coefficient.

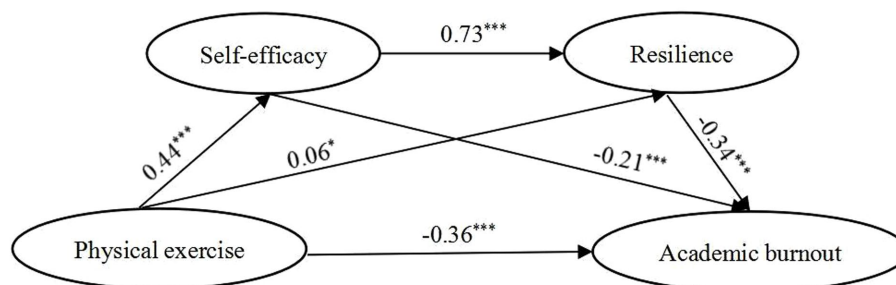


FIGURE 2

Model showing the mediating roles of self-efficacy and resilience in the relationship between physical exercise and academic burnout (Female sample). *** $p < 0.001$, * $p < 0.05$; significant standardized regression coefficient.

physical exercise was significantly and negatively associated with academic burnout and its three subfactors (emotional exhaustion, improper behavior, and low personal achievement) in a sample of college students, thus supporting H1. Thus, we provide evidence that physical exercise has a direct and negative predictive effect on academic burnout in this context. Previous research showed that physical exercise had the potential to not only reduce stress in college students (Herbert et al., 2020) but also improve their cognitive abilities and academic performance (Voss et al., 2011; Li et al., 2017). These factors are important in addressing academic burnout and its negative impact (Lin and Huang, 2014; May et al., 2015). Regarding the effects derived from different levels of physical exercise, our analyses showed significant differences in academic burnout levels among high, medium, and low physical exercise groups. Simultaneously, the level of academic burnout sequentially increased with decreased levels of exercise; this corresponds with the findings of previous studies (Gerber et al., 2015; Khosravi et al., 2020). This may be because more physically active university students have more benefits associated with lower academic burnout, such as better sleep quality, greater self-control, and lower physical vulnerability to stress (Seibert et al., 2016; Boat and Cooper, 2019; Lee et al., 2020; Khosravi, 2021). In addition, we found significant differences in the relationship between physical exercise level and academic burnout among college students of different genders. Thus, these results highlight

the importance of considering the volume of physical exercise and gender differences when developing physical exercise programs, wherein moderate and higher levels may more efficiently alleviate academic burnout.

In addition to the direct effect, we tested for indirect effects in the relationship between physical exercise and academic burnout. We thus found that self-efficacy mediated the relationship between physical exercise and academic burnout, which supported H2. On the one hand, physical exercise helps to create positive body image for university students (Toselli and Spiga, 2017), which enhances their body satisfaction and self-efficacy (Ouyang et al., 2020). On the other hand, students with high self-efficacy tend to adopt more advantageous learning strategies and goals to improve academic performance (Alhadabi and Karpinski, 2020), which is beneficial to reducing the risk of academic burnout (Rahmati, 2015; Merhi et al., 2018). In this regard, physical exercise can influence self-efficacy, which then influences academic burnout. Given the general lack of research in this area, our results further reinforce the verified relationship between these factors. Thus, self-efficacy works as a bridge between physical exercise and academic burnout. Campus administrators should introduce programs to help students develop self-efficacy via physical exercise to combat academic burnout more effectively.

According to indirect pathway 2, in the total sample and female sample, resilience mediates the impacts of physical exercise

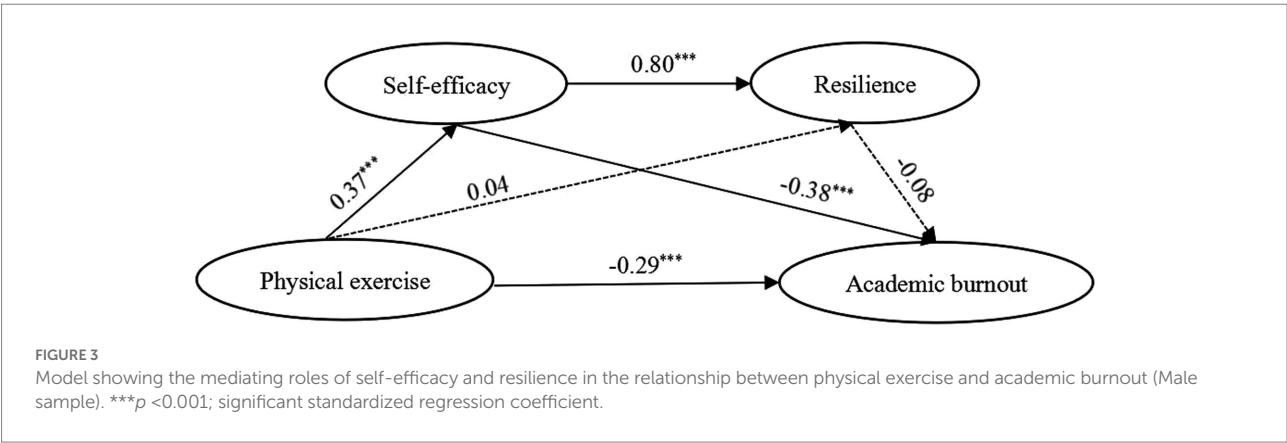


Table 4 The path and standardized indirect/direct effects of physical exercise on academic burnout in college students.

Path	Total			Male			Female		
	Effect size	SE	95%CI	Effect size	SE	95%CI	Effect size	SE	95%CI
Direct effect	-0.1104	0.0160	-0.1421, -0.0791	-0.1187	0.0240	-0.1654, -0.0711	-0.1369	0.0202	-0.1762, -0.0978
Total indirect effect	-0.2052	0.0174	-0.2393, -0.1708	-0.1683	0.0266	-0.2227, -0.1181	-0.2182	0.0207	-0.2593, -0.1774
Indirect 1	-0.1148	0.0187	-0.1524, -0.0795	-0.1417	0.0291	-0.2037, -0.0873	-0.0908	0.0234	-0.1387, -0.0464
Indirect 2	-0.0101	0.0049	-0.0204, -0.0010	-0.0031	0.0041	-0.0134, 0.0030	-0.0195	0.0088	-0.0380, -0.0029
Indirect 3	-0.0802	0.0144	-0.1088, -0.0527	-0.0234	0.0216	-0.0656, 0.0183	-0.1079	0.0171	-0.1422, -0.0750

on academic burnout. Therefore, it can be inferred that H3 is correct. Our findings support previous research findings that physical exercise promotes resilience in college students (Román-Mata et al., 2020; Dunston et al., 2022). Some researchers believe this is a result of physical exercise providing an appropriate setting for improving resilience (Xu et al., 2021). In addition, our study revealed that resilience was negatively associated with academic burnout. A previous study also found that the majority of those with higher levels of resilience showed lower levels of academic burnout, which was attributed the fact that resilience is a psychologically protective resource that allows students to resist the stress of school (Fernández-Castillo and Fernández-Prados, 2021). However, physical exercise in the male sample was not a significant predictor of resilience, possibly because males are more susceptible to masculinity-seeking and interpersonal relationship resolution in sports, thus affecting the resilience-promoting effect of physical exercise (Overholt and Ewert, 2015). The predictive effect of resilience on academic burnout was also not significant in the male sample, possibly because males have higher cynicism relative to females, which correlates less with resilience than emotional exhaustion and low achievement, resulting in a poor resistance of resilience to academic burnout (Isabel Rios-Risquez et al., 2016; García-Izquierdo et al., 2018). Therefore, strategies to

intervene in resilience and academic burnout through physical exercise seem to be more applicable to female college students, compared to male college students.

Looking at indirect pathway 3, self-efficacy and resilience play a serial mediating role in the relationship between physical exercise and academic burnout, which supports H4. Although there is no previous direct evidence of the relationship between physical exercise, self-efficacy, resilience, and academic burnout, some studies have confirmed the role of self-efficacy in promoting resilience (Hamill, 2003; Cassidy, 2015; Sabouripour et al., 2021). Similarly, self-efficacy is an important personal resource for the development of resilience (Benard, 2004; Narayanan and Weng Onn, 2016). In conjunction with the above, we believe that college students can enhance self-efficacy *via* physical exercise, which then promotes resilience and ultimately ease their academic burnout. In addition, given the low effect size of physical exercise on resilience found in indirect path 2, we believe that self-efficacy functions as a bridge between physical exercise and resilience. In a word, physical exercise not only directly affects academic burnout among college students, but also indirectly through the serial-mediating effects of self-efficacy and resilience. This provides an important practical reference for solving the problem of academic burnout among college students.

Limitations and future research

Although our study deepens the scholarly understanding of the relationship between physical exercise and academic burnout in college students, there were also some limitations. First, this study did not cover important factors that influence academic burnout, such as socioeconomic status, age, and personality traits (e.g., novelty seeking). Future research should consider external environmental and individual characteristic factors to reveal a more comprehensive picture of the relationship between physical exercise and academic burnout among college students. Second, the survey sample only involved students from universities in Chongqing and had a higher proportion of female students, which may reduce the generalizability and analytical efficacy of the study results. Future studies should expand the sampling scope and focus on a balanced gender ratio. Third, although we inferred the temporal ordering of the structure presentation in the model based on the positive psychological effects of physical exercise, it is not appropriate to consider any observed association as causal, given the cross-sectional design. In addition, we measured participants' retrospective independent variable status, which may lead to reporting bias. Future research should conduct longitudinal intervention trials to measure physical exercise and academic burnout using more objective physiological and psychological indicators and focus on the characteristics of long-term changes in the relationship between the two.

Conclusion

This study demonstrates that physical exercise has a negative impact on academic burnout and its subfactors. In this study, self-efficacy and resilience played mediating roles in the effect of physical exercise on academic burnout. College students in the high physical exercise group showed lower levels of academic burnout than those in the moderate and low physical exercise groups. We suggest that directing university students to actively engage in physical exercise for developing self-efficacy and resilience may effectively contribute to preventing academic burnout.

Data availability statement

The original contributions presented in the study are included in the article/[Supplementary material](#), further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by the Ethics Committee at South West

University. Written informed consent from the participant's legal guardian/next of kin is not required to participate in this study with the national legislation and the institutional requirements.

Author contributions

KC and LG designed the study and revised the manuscript. KC and FL provided the original manuscript. LM and PZ collected and analyzed the data. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpsyg.2022.964169/full#supplementary-material>

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Everything, everywhere, all at once: A study of polychronicity, work-school facilitation, and emotional exhaustion in working students

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This study investigates how a preference for multitasking serves as a resource toward mitigating emotional exhaustion through the mediating role of work-school facilitation. Utilizing conservation of resources (COR) theory, we utilized a sample of 153 working students in a time-lagged study to examine the relationship between these variables. Results suggest that polychronicity serves as a valuable resource toward balancing the simultaneous needs of work and school, and ultimately, decreasing academic emotional exhaustion. The findings presented in this study further advance scholarship in this domain by highlighting our understanding of polychronicity as an individual difference variable in facilitating role balance within the school–work domain. Practical implications and limitations are discussed.

KEYWORDS

polychronicity, work-school facilitation, emotional exhaustion, mediation analysis, working students, conservation of resources theory

Introduction

A recent study by the [National Center for Education Statistics \(2018\)](#) found that over 40 percent of full-time students in the United States were employed 40 hours per week or more ([National Center for Education Statistics, 2018](#)). This trend toward balancing the simultaneous needs of work and school is exacerbated by the prevalence of technology making almost everything, everywhere to be available at the touch of a button. Determining which information is valid, how to use it, and how to go about one's daily tasks and routines using this information can be challenging. College students who also work face unique challenges as they navigate multiple obligations while being exposed to massive amounts of information from school, work, family, friends, and media, possibly leading to increased stress and anxiety in all facets of their life, but particularly at school since the cost of school failure is high.

When working students fail on the job, they often have other opportunities for employment. However, when they fail at school, the costs are often significant in terms of their financial costs, with the average student debt approaching \$26,000 for public, 4-year bachelor degree institutions ([National Center for Education Statistics, 2020](#)). Moreover, recent research investigating stress in working students found this segment of the population experienced higher burnout in school-related situations than in work-related situations ([Draghici and Cazan, 2022](#)). Since stress resulting from multiple sources may lead to increased levels of academic emotional exhaustion ([Kremer, 2016; McNall and Michel, 2017](#)), which is characterized which is defined as being emotionally overextended and exhausted by one's studies, researchers have shown an increasing interest in multitasking as it relates to balancing the needs of work and school. The current study investigates

how one's orientation toward multitasking, also referred to as polychronicity, will mitigate emotional exhaustion in the school domain for a sample of working students.

Based on early scholarship by Hall (1959), individuals differ on how they perceive, prioritize, and allocate their time. Those individuals who prefer to undertake and manage multiple activities at a time have a polychronic orientation toward time while individuals who prefer to complete one task prior to embarking on another are said to have a monochronic orientation (Bluedorn et al., 1992). Polychronicity is distinct from other personality traits (Conte and Jacobs, 2003) and the increased flexibility associated with one's orientation toward multitasking makes this an ideal individual difference variable to investigate its influence on emotional exhaustion in this segment of the population since the way work is performed may influence one's psychological responses to that work.

Prior empirical research has found that polychronicity negatively correlates to turnover intentions (Jang and George, 2012) and is positively related to job performance (Asghar et al., 2021), job satisfaction, and work engagement (Conte et al., 2019). Polychronicity was also found to reduce role ambiguity (Fournier et al., 2013). Moreover, recent scholarship investigating work–family conflict found that polychronicity serves as a negative antecedent to work overload, thus suggesting that a preference for undertaking multiple roles serves as an important resource for mitigating stress (Korabik et al., 2017). These findings suggest that an orientation toward multitasking should serve as a resource toward balancing simultaneous work and school responsibilities among working students. Indeed, the vast majority of empirical studies appearing in the work-life and work-school domains have focused on conflict and stress from undertaking multiple roles (Greenhaus and Powell, 2006; Choo et al., 2021) rather than investigating their positive aspects.

Conservation of resources (COR) theory is used to investigate the relationship between polychronicity and emotional exhaustion. COR theory, as postulated by Hobfoll et al. (2018), states that individuals are motivated to acquire, protect, and retain resources which they value, as well as acquire new resources to help them respond to stressful conditions such as anxiety, depression, and work–family conflict. In this regard, resources are characterized as states, objects, or conditions of value. More specifically, resources can be considered as anything perceived by an individual to help attain their goal (Halbesleben et al., 2014), and can be classified as organizational or personal in nature (Schaufeli, 2017). These types of personal or psychological resources include malleable personal attributes, such as self-esteem, optimism, and self-efficacy, or stable, individual difference traits, such as extraversion, emotional stability, and locus of control (Halbesleben et al., 2014). As such, we consider polychronicity to be a resource as well. Emotional exhaustion, viewed through the lens of COR theory, is associated with the loss of key resources such as leisure and rest when students experience stress from undertaking their work and school roles simultaneously. We contend that working students utilize their orientation for multitasking to not only preserve their resources, but to also negotiate the simultaneous demands of work and school in efforts to prevent emotional exhaustion in their studies.

We introduce an additional theoretical framework, work-family enrichment theory (Greenhaus and Powell, 2006) to account for the transfer of resources across roles. This theory, which contends that resources obtained in one role such as work, may facilitate or enrich another role such as family, school, or well-being. Consistent with this theory, we utilize work-school facilitation, which is defined as

“improvement in the quality of the school role resulting from participation in work” (Butler, 2007, p. 501), as a mediator to account for the polychronicity-emotional exhaustion relationship. Work-school facilitation has been shown to increase student dedication and well-being (Creed et al., 2015), life satisfaction (Cinamon, 2016), and performance at school (Butler, 2007). We contend that polychronicity, an individual difference trait, will enable working students to balance the competing needs of work and school through increased enrichment in their work and school roles. The enrichment gained by working students is expected to spill over into the school domain, thus decreasing their emotional exhaustion.

This study makes two important contributions to existing scholarship. First, we investigate how individual differences in working students' orientation for multitasking (polychronicity) will influence their emotional exhaustion toward school. Prior empirical literature has primarily investigated polychronicity within the workplace with few studies examining the effect of this trait in the academic context (Capdeferro et al., 2014). Our second contribution expands scholarship into the work-school interface by examining how polychronicity, considered a stable personality trait (Slocombe and Bluedorn, 1999), serves as a resource for working students to enrich their work and school roles, by extending the work-family theoretical framework of Greenhaus and Powell (2006) into the work-school domain. In doing so, we answer the call by Nicklin and McNall (2013) for empirical research to consider other psychological traits such as polychronicity in the work-school context. Moreover, we are not aware of any empirical study investigating polychronicity as an antecedent to work-school facilitation in this domain.

Theory and hypotheses

According to COR theory, resources may encompass numerous social, physical, or psychological attributes perceived by an individual to help them attain their goals or objectives (Halbesleben et al., 2014). Moreover, individuals with an accumulation of resources are in a better position to resist stressful circumstances that may adversely impact their well-being (Hobfoll et al., 2018). Halbesleben et al. (2014) identified numerous personality factors and traits, which serve as positive psychological resource. Previously investigated within COR theory, empirical studies investigating these “key” traits include self-efficacy and self-esteem (Xanthopoulou et al., 2009), conscientiousness (Halbesleben et al., 2009), and core-self-evaluations (McNall and Michel, 2011). Specific to the current study, working students with greater resources who experience the daily demands from their work and their studies are more capable of avoiding negative outcomes, such as stress, anxiety, and emotional exhaustion.

Another proposition of COR theory states that those individuals who have a greater reservoir of resources have a greater opportunity to invest these resources (Halbesleben et al., 2014). In this regard, polychronicity may be considered a buffer to protect against the threat of resource loss. Being a stable personality trait, polychronicity aims to increase working students' ability to undertake multiple roles, providing them with the ability to further increase and invest their resources in efforts to prevent exhaustion. Korabik et al. (2017) found polychronicity was negatively related to workload, with lower workload being related to lower turnover intentions and higher family satisfaction, and ultimately life satisfaction. In a similar fashion, Mittal and Bienstock (2018) proposed a direct positive association between polychronicity

and life satisfaction based on their orientation to multitask and lower conflict among different their work and life roles. In particular, [Mittal and Bienstock \(2018\)](#) note that polychronicity serves as a key personal resource by "...allowing people to manage their time more effectively, thereby lowering the level of overall conflict" ([Mittal and Bienstock, 2018](#), p. 464). Extending this rationale to the work-school interface, polychronicity is expected to serve as a key personal resource for working students not only by enriching their experiences at work and school, but also through mitigating their feelings of exhaustion in their studies.

As previously mentioned, conservation of resources theory states that resources are integral to enabling an individual to achieve their goals ([Halbesleben et al., 2014](#)). We contend that polychronic students will find it easier to multitask on and accomplish their daily responsibilities, tasks, and projects, and apply these skills and experiences gained in the workplace to their school roles. We contend that the value added resource of polychronicity is best summarized by [Kaufman et al. \(1991\)](#) who note that these individuals "...are likely to combine some of their cross-role demands into efficient periods of polychronic time use, neatly dovetailing several demands through the complementary use of their time, skills, and energy resources" (p. 394). Providing a contextual example of facilitation would entail being able to alternate between helping customers and performing administrative tasks at work. These enriching experiences gained on the job would further enable working students to mitigate exhaustion by meeting academic deadlines, performing well on exams, and succeeding in their studies. Therefore, we expect working students with a polychronic orientation to enrich, or facilitate their work and school roles, thus leading to our first hypothesis:

H1: Polychronicity is positively related to work-school facilitation.

Enrichment theory ([Sieber, 1974; Greenhaus and Powell, 2006](#)) contends that participating in certain roles creates resources, which can benefit and transfer to other roles. Working students who experience positive affect from the experiences, skills, social capital, and increased flexibility associated with work-school facilitation will experience low levels of emotional exhaustion in their role at school. Prior scholarship in the work-family domain has found support for both direct enhancement in the originating domain and cross-transfer of resources into other roles ([Carlson et al., 2014; McNall et al., 2021](#)). Extending enrichment theory into the academic context, [Butler \(2007\)](#) found work-school enrichment associated with increased school satisfaction and performance. In addition, [McNall and Michel \(2017\)](#) found that work-school enrichment was positively related to general psychological health and negatively related to burnout ([McNall and Michel, 2017](#)), suggesting that the positive experiences and skills working students obtain on the job benefit, or spill over to their role in university. Following this logic, we expect work-school facilitation to have a positive impact on working students and mitigate exhaustion in their studies, advancing the following hypothesis:

H2: Work-school facilitation is negatively related to emotional exhaustion.

Prior empirical research investigating polychronicity has yielded mixed findings on various academic and workplace outcomes and on inter-role conflict ([König and Waller, 2010; Korabik et al., 2017](#)). One reason for this negative relationship can be attributed to the

fragmented attention span of polychrons, which prevents them from gaining a deeper focus and understanding of the tasks at hand, leading to cognitive exhaustion ([Madjar and Shalley, 2008](#)). Another reason may be explained by their lack of punctuality and being able to meet deadlines ([Bluedorn et al., 1999; Conte and Jacobs, 2003](#)). Conversely, the preference polychrons exhibit toward completing simultaneous tasks makes them less prone to stress from role overload ([Kaufman et al., 1991](#)) while increasing their satisfaction on the job ([Hecht and Allen, 2005; Arndt et al., 2006](#)). This increased enrichment through the skills and experiences gained on the job is integral to reducing stress and exhaustion at school. In addition, [Schaufeli \(2017\)](#) argues that stable personality traits such as extraversion and emotional stability will serve as antecedents to reducing the stress from job demands. Building upon Hypotheses 1 and 2, we integrate a mediational framework with polychronicity as a distal, individual difference variable increasing work-school facilitation, a proximal variable, integral to reducing emotional exhaustion. Given that polychronicity is not expected to have an effect on emotional exhaustion directly, we rely on work-school facilitation to mediate this proposed framework. Based on this rationale, we propose the following hypothesis:

H3: Work-school facilitation mediates the relationship between polychronicity and emotional exhaustion.

Methods

Participants

We collected surveys from 153 third and fourth-year students enrolled in an undergraduate management course from a medium-sized public university in Texas. Students included in this sample were registered either in online or face-to-face sections of their courses and worked an average of 32 h per week. This sample included 71% females, 28% males, and 1% who declined to answer, with an average age of 25 years old. Sample respondents identified as the following: African American: 11%, Hispanic: 35%, Caucasian: 40%, Asian: 5%, Native American: 1%, Middle Eastern: 1%, and other ethnicity: 3%, while 5% of respondents chose not to answer. Students who voluntarily participated were provided extra credit, which counted toward their final grade in the course.

Design

We implemented a time lag of 4 weeks between collecting data for our independent variables of polychronicity and work-school facilitation, and emotional exhaustion to mitigate against common method bias ([Podsakoff et al., 2003](#)). Students were provided an online survey link in Qualtrics for Waves 1 and 2 of the survey.

Measures

Polychronicity

We assessed polychronicity using the Inventory of Polychronic Values (IPV, [Bluedorn et al., 1999](#)). This 10-item scale was modified to measure this concept at the individual level by replacing each item stem

from “We” to “I.” A sample item included “I like to juggle several activities at the same time.” Responses were recorded on a seven-point Likert scale with values ranging from 1 “strongly disagree” to 7 “strongly agree” ($\alpha=0.81$).

Work-school facilitation

Work-school facilitation was measured using five items from Butler (2007). Sample items included “The skills I use on my job are useful for things that I have to do at school.” Responses were recorded on a five-point Likert scale with values ranging from 1 “never” to “very often” ($\alpha=0.82$).

Emotional exhaustion

We measured emotional exhaustion from work using a seven-item scale (Maslach and Jackson, 1981), adapted for the academic context (cf. McNall and Michel, 2017). Participants were asked to rate their frequency with being exhausted from their studies ranging from 1 = strongly disagree to 7 = strongly agree. A sample item included “I feel emotionally drained from my school” ($\alpha=0.90$).

Analysis

We employed Hayes’ PROCESS methodology (Model #4) using a macro for SPSS (Hayes, 2013) utilizing 5,000 bootstrapping iterations. All effects are considered significant if their bias-corrected confidence intervals excluded zero. The level of significance was 0.05 for all regressions performed in this study.

Statistical control

We controlled for job and school-oriented factors to ensure that variation in emotional exhaustion was not being driven by demands associated with these contexts. In accordance with Wyland et al. (2013), we controlled for the number of credit hours per semester with an indicator for the following categories: 1–3; 4–6; 7–9; and 12 plus credit hours. In addition, we controlled for the number hours worked per week and the participant’s position within the organization with an indicator variable for the following categories: non-management; front-line management; and middle or upper management. Finally, to mitigate the possibility that emotional exhaustion is attributed to whether the student is enrolled in online

or in-person learning, we included an indicator variable if the student was registered in an online course.

Results

Table 1 reports the correlations, respective means, standard deviations, and reliabilities for all variables used in the study. Figure 1 illustrates the paths of our hypothesized model. As expected, we did not find a direct effect between polychronicity and emotional exhaustion. Consistent with Hypothesis 1 and 2 respectively, we found that polychronicity was positively related to work-school facilitation (*point estimate* = 0.32, *SE* = 0.08, *CI*_{95%} = 0.157, 0.486) and work-school facilitation was negatively related to emotional exhaustion (*point estimate* = −0.31, *SE* = −0.13, *CI*_{95%} = −0.559, −0.056). We found no evidence of a direct effect between polychronicity and emotional exhaustion (*point estimate* = −0.01, *SE* = 0.13, *CI*_{95%} = −0.281, 0.253); however, we found a negative, and significant indirect effect for the relationship between polychronicity and emotional exhaustion when mediated by work-school facilitation (*point estimate* = −0.10, *SE* = −0.05, *CI*_{95%} = −0.213, −0.016), thus supporting Hypothesis 3. As an additional measure of robustness, we ran a separate analysis in PROCESS setting the level of significance to 0.01 and our effect sizes remain unchanged. When introducing control variables in our study, our effect sizes remained similar, however their level of significance decreased to 0.05.

Discussion

The current study investigated how polychronicity in working students serves as a resource to mitigate emotional exhaustion through the mediating mechanism of work-school facilitation. This orientation for engaging in multiple tasks simultaneously led to an increase in work-school facilitation, which subsequently decreased exhaustion. Our findings remained consistent when controlling for the number of credits enrolled, hours worked per week and position within the organization.

Theoretical implications

The findings from this study are consistent with prior scholarship which found polychronicity associated with greater work engagement (Conte et al., 2019) as well as higher levels of positive affect and

TABLE 1 Descriptive statistics and correlation matrix.

	M	SD	1	2	3	4	5
Polychronicity	3.58	0.94	(0.81)				
Work-school Facilitation	3.17	0.98	0.29**	(0.82)			
Emotional Exhaustion	3.46	1.47	−0.05	−0.23**	(0.90)		
Credit Hours	3.58	0.80	0.08	−0.30**	0.07		
Work Hours	31.89	12.55	0.09	0.18*	−0.18*	−0.33**	
Position in Company	1.35	0.64	0.08	0.19*	0.02	−0.16*	0.39**

N = 153. Credit hours were measured with an indicator variable with the following categories: 1–3; 4–6; 7–9; and 12 plus credits. Position was measured with an indicator variable with the following categories: non-management; front-line management; and middle or top management. Reliabilities indicated in parenthesis.

* $p < 0.05$; ** $p < 0.01$.

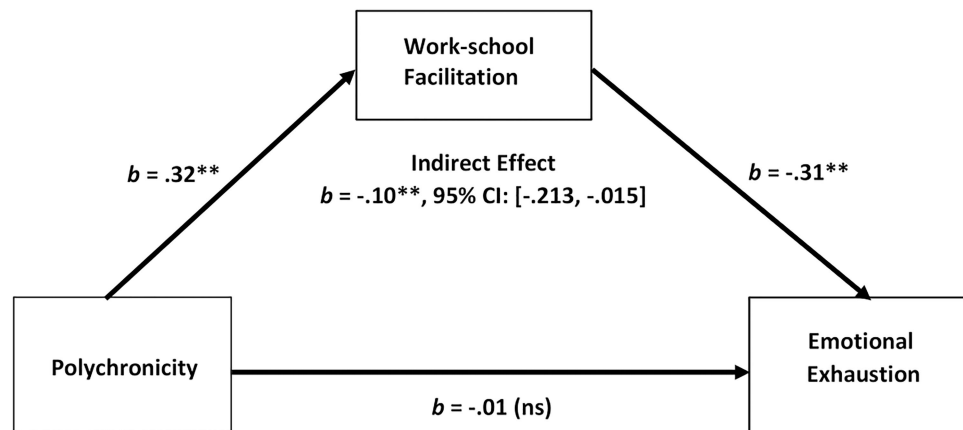


FIGURE 1

Mediation model outlining the relationship between polychronicity and emotional exhaustion. $^{**}p < 0.05$.

self-efficacy, in addition to lower levels of psychological strain (Hecht and Allen, 2005). Our results suggest that polychronicity serves as a resource by enabling those with a time management orientation toward multitasking to more effectively balance multiple tasks and responsibilities to their advantage, thus mitigating school-related exhaustion. In doing so, we provided a unique contribution to the existing scholarship in polychronicity by investigating this individual difference trait in working students. Borrowing from the work-life literature, we integrated a mediational framework within the school-work interface to investigate this under-researched domain (Choo et al., 2021). This is the first study, to the best of our knowledge, to jointly investigate work-school facilitation as a mediator to account for the relationship between polychronicity and emotional exhaustion.

Consistent with the central premise of COR theory (Hobfoll et al., 2018), our findings underscore the importance of personal resources in counteracting stressful situations by balancing the needs of work-school obligations. By examining how individual differences in student multitasking orientations can mitigate exhaustion, we expand the use of stable personality traits within COR theory. In doing so, we expand upon recent scholarship in the work-family domain literature (Korabik et al., 2017), by investigating polychronicity within the work-school context.

Limitations

We acknowledge some limitations inherent to our study. Our sample investigated work-school facilitation and emotional exhaustion in undergraduate working students, and therefore, our findings may not generalize to other academic majors or graduate student populations. Rather than identifying themselves as working students (*cf.* Butler, 2007), graduate students, in particular those pursuing an MBA, may consider themselves as “employees who are enrolled in courses” (Wyland et al., 2013, p. 348). In this scenario, these individuals may be in a better position to negotiate the competing demands of both work and school, irrespective of their preference to multitask. We acknowledge another limitation in the current study is the sample size, which may not be representative of the large percentage of students across majors outside

of business school students, thus limiting the external validity of our study. Finally, our model only investigated polychronicity as a resource toward mitigating emotional exhaustion. It is plausible that other resources of a personal (self-efficacy and locus of control) and contextual orientation (supervisor and coworker support) may serve to increase work-school facilitation and reduce emotional exhaustion in working students. Future research investigating a combination of these personal resources holds great promise.

Practical implications

Our findings may also provide a partial explanation for the current labor shortage. The “Great Resignation” occurring in the past few years has created a problem for organizations struggling to fill openings, and shortages in customer service industries such as retail and hospitality are particularly severe (Goldberg, 2022). These jobs are often filled by college students due to the flexible nature of the work, which allows students to work while going to school. However, students who have difficulty navigating multiple obligations due to having access to everything, everywhere, all at once may experience increased stress and anxiety and, as a result, stop working. Indeed, traditional college students today are part of Generation Z, the generation most likely to experience stress according to researchers (American Psychological Association, 2020). If students learn how to develop their ability to multitask, these student employees may be less prone to emotional exhaustion; thus improving their mental health, improving their academic progress, and providing economic benefits to themselves and society. Finally, although we did not directly investigate the effects of polychronicity in the workplace, prior research has found this concept associated with lower levels of work overload (Korabik et al., 2017) as well as increased job satisfaction and work engagement (Conte et al., 2019). In this regard, managers may wish to identify those working students with an orientation toward multitasking in efforts to enrich their work experiences, and ultimately their job satisfaction (Wyland et al., 2016).

Conclusion

This study contributed to the literature in school and work balance by investigating how polychronicity serves as a resource for mitigating emotional exhaustion. Our findings underscore the importance of integrating mediation analysis to further determine how individual differences in time orientation influence personal outcomes. We hope that our findings guide future scholarship to further investigate the interface between role conflict and facilitation within this domain.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by this study was approved by the Office of Research and Sponsored Programs at Sam Houston State University (IRB-2021-287) prior to collection of data. All data were collected in accordance with standard ethical guidelines governing research on human subjects. Informed consent was obtained from all participants prior to data collection. The patients/participants provided their written informed consent to participate in this study.

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Author contributions

AG was primarily responsible for the data analysis and manuscript writing. AG and JL were equally responsible for the conceptual and theoretical development of this manuscript and provided data for the study. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The effect of anti-frustration ability on academic frustration among Chinese undergraduates: A moderated mediating model

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Background: With the ongoing push to improve the quality of talent in all professions, academic pressure on undergraduates is gradually increasing, leading to students feeling increasingly frustrated by academic stressors. As it becomes more widespread, the resulting issue of academic frustration is attracting public attention.

Aim: The current study explored the relationship between undergraduate anti-frustration ability (AFA) on their academic frustration (AF), focusing specifically on the roles played by core competence (CC) and coping style (CS) in this relationship.

Methods: Our sample comprised 1,500 undergraduate students from universities in China. Data collection made use of the Ability to Anti-Frustration Ability Questionnaire, the Academic Frustration Questionnaire, the Core Competence Questionnaire, and the Simple Coping Style Questionnaire.

Results: The results showed that: (1) AFA negatively predicted the AF of undergraduates, with CC mediating this relationship and (2) CS had a moderating effect on the relationship between CC and AF. We concluded that students who employ positive CS may be more successful in alleviating their AF to a larger extent, with the mediation of CC.

Interpretation: The results revealed the mechanism of AFA on AF, which will help schools consider and guide students' skills and abilities, both academically and personally.

KEYWORDS

anti-frustration ability, academic frustration, core competence, coping style, Chinese undergraduate

Introduction

Academic frustration (AF) is defined as a negative psychological emotion experienced by students when they are unable to deal with frustration in their learning process (Ballmann et al., 2022). AF can negatively impact students' interest and enthusiasm in their academic activities, causing them to feel isolated due to their perceived failures, thereby further lowering their personal achievement motivation (Neff et al., 2005). Although AF is a negative emotional experience, it may sometimes lead to positive outcomes. For example, negative emotional experiences can have an amplification function whereby individuals become more motivated to address their own problems with purpose, which is conducive to targeted problem solving (Mather et al., 2015; Xie and Zhang, 2016). Nonetheless, confusion and frustration in academic activities may enhance students' learning effect in the short term, however the feeling of frustration nevertheless is detrimental on the

long-term learning effect (Peddycord-Liu et al., 2013). In other words, while AF may sometimes be helpful, it does appear to harm study outcomes in the long run.

Thus far, little research has directly investigated specifically students' AF. Instead, studies have focused primarily on some of the leading factors that might cause AF, such as academic failure or level of frustration tolerance. For example, Perry et al. (2005) found that students' academic failure is intimately related to their perceived academic control. Those with high academic control pay little attention to academic failure, which leads to little AF. Harrington (2005) found that students with different levels of frustration tolerance might adopt different strategies to deal with stress during the learning process to relieve frustration. Several studies have pointed out that anti-frustration ability (AFA) is a crucial factor causing negative academic emotions, e.g., academic frustration (see Ou et al., 2013; Yang and He, 2018; Yang et al., 2021). The concept of AFA may be derived from frustration tolerance (Yang and He, 2018). While frustration tolerance described one's ability to *bear* or *withstand* the pressure when encountering setbacks, AFA emphasizes the ability to not only *endure* frustration but to *grow* with frustration, and *take action* against frustration (Yang and He, 2018). Wang et al. (2006) have argued that people with high resilience, that is, those who possess high AFA, tend to experience more positive emotion. When in moments of frustration, individuals with high AFA are able to employ different strategies such as self-deprecation or humor to produce more positive feelings, alleviate stress, and adapt to the environment (Block and Kremen, 1996; Tugade and Fredrickson, 2004). Dialectical behavior therapy (DBT) contends that the tolerance of pain, in this case frustration tolerance, plays a central role in one's ability to adapt to undesirable behaviors and alleviate frustration (Simons and Gaher, 2005). Frustration tolerance is the reflection of students' view and attitude toward AF (Li et al., 2019). However, each person adapts to frustration differently. People with strong frustration tolerance can withstand stressors and manage to find their way through periods of learning difficulties (Li et al., 2019). As studies indicate that AFA might play an important role in college students' ability to deal with their AF, we thus proposed our first hypothesis: AFA directly influences students' AF (H1).

Theoretically, AFA can trigger positive emotion—which is initially constructive—and thus broaden an individual's attention and cognition (Fredrickson, 2003). This facilitates one's ability to enrich their persistent resources. In this process, core competence (CC, or key competence) is regarded as a kind of crucial persistent resource that might work on AFA's influence upon AF. CC is the essential character and crucial competencies that enable students to adapt to the changing world (Wiek et al., 2011). CC facilitates the development of one's creativity, self-directedness, and self-motivation (Xin et al., 2016). It also helps students to deal with various challenges, including those they face in their academic activities. Scholars tend to regard CC as an important part of the fundamental dynamics that facilitate a student's ability to adapt to the future world (Lin, 2016). According to Huang et al. (2016), CC is multi-layered, involving culture-related literacy (e.g., language, mathematics, science), self-related literacy (e.g., learning skills, mental health, self-management), and society-related literacy (e.g., social responsibility, value, beliefs). Guerra and Bradshaw (2008) have pointed out that youth should develop five core competencies including (1) a positive sense of self, (2) self-control, (3) decision-making skills, (4) a moral system of belief, and (5) prosocial connectedness. The cultivation of undergraduates' core qualities is a key requirement of the connotative development of higher education, as well as an important way to carry

out the fundamental task of establishing morality and cultivating talents and developing socialist builders and successors with all-round development of morality, intelligence, physique, and esthetics (Lin, 2016). With the ongoing evolution of educational resources, both conceptually and tangibly, undergraduates are being pushed to perpetually improve their individual comprehensive abilities, to achieve an increased comprehensive development in their studies and personal life. A study conducted in Chinese high schools found that students' AFA was significantly positively related to CC (Li et al., 2020), while Xing et al. (2018) showed that AFA can impact students' CC development, and CC, in turn, helps students deal with difficulties in their academic activities. Based on these findings, we proposed our second hypothesis: CC plays a mediating role in students' AFA's influence on their AF (H2).

Coping style (CS) in the current study is defined as one's cognitive and behavioral efforts utilized to help one adapt to their environment (Lazarus, 1993). Depending on its impact on one's mind and body, CS can be both positive and negative. Positive CS are problem-centered, that is, the individual tries to solve practical problems, while negative CS are emotion-centered, that is, individuals reduce their negative emotions by using coping strategies such as avoidance and denial (Di et al., 2015). Regarding the theory of CS, contextualism holds that one's CS can vary across different situations (Furtado et al., 2016). For example, in the context of academic difficulties, the CS that one adopts will depend on their evaluation of controllable events and the resources they can access to manage stress (Furtado et al., 2016; Su et al., 2021). Positive or adaptive strategies decrease the amount of stress one perceives and experiences, while negative or maladaptive strategies diminish symptoms of stress but without addressing the real problem or disorder. When employing a positive CS, individuals are able to mobilize more psychological resources, including CC (Matud, 2004). Li et al. (2020) found that CC was closely related to positive CS: individual with high CC tended to employ a positive CS during moments of difficulty. Okechukwu et al. (2022) showed that those who employ a positive CS are better able to deal with their AF. Moreover, a positive CS enables people to experience happiness and pride in their learning, both of which can increase their academic motivation and interest while decreasing their AF (Fitzgibbon and Murphy, 2022). Based on these findings, we proposed our third hypothesis: CS can be viewed as a moderator in CC's relationship with AF (H3).

To sum up, the present study constructed a moderated mediation model (Figure 1) in which AFA impacts students' AF through the mediating role of CC, while CS also moderates CC's effect upon AF. This model provides a heuristic framework to understand how and when students' AF is affected by their AFA.

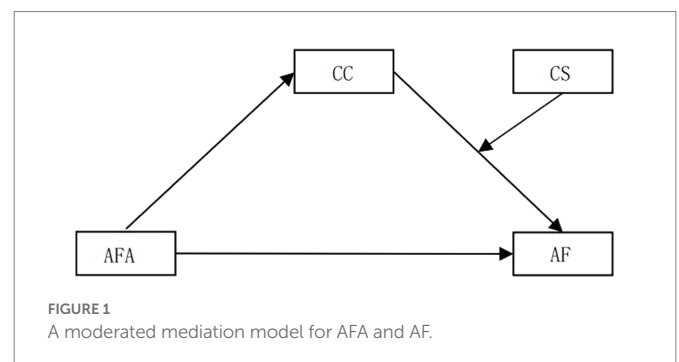


TABLE 1 Sample characteristics ($n=1,500$).

	<i>n</i>	%
<i>Gender</i>		
Male	829	55.3
Female	671	44.7
<i>Grade</i>		
Freshman	584	38.9
Sophomore	623	41.5
Junior	241	16.1
Senior	52	3.5
<i>Hometown area</i>		
Urban	474	31.6
Rural	1,026	68.4
<i>Academic performance</i>		
In the top 1/3 of the class	512	34.1
In the middle 1/3 of the class	776	51.7
In the bottom 1/3 of the class	212	14.1

Methods

Participants

Our study sample was made up of undergraduate students studying in China. We sent out 1,800 online questionnaires *via* Sojump¹ to undergraduate students at 32 different universities in China, covering 18 provinces. The sampling was incidental, due to accessibility. A total of 1,500 undergraduates ultimately took part in the research. All participants gave informed consent before filling out the questionnaire. Of the full sample, 55.3% were male ($n=829$) and 44.7% were female ($n=671$). The age of the participants ranged from 16 to 25 years. More information on the composition of the study sample is shown in Table 1.

Measures

Anti-frustration ability questionnaire

Developed by Zhang (2013), this questionnaire using a total of 48 items to measure 10 factors. These factors are frustration tolerance, frustration resilience, frustration experience, career programming ability, confidence, interpersonal interaction ability, frustration understanding ability, psychological preparation, attribution ability, and attribution ability. Respondents rate each item using a five-point scale, ranging from 1 (completely disagree) to 5 (completely agree). A high total score indicates high anti-frustration ability. Cronbach's α for the total questionnaire in the present study was 0.95.

Academic frustration questionnaire

This questionnaire was developed by Zhang (2020), and uses 41 items to measure six factors. These factors include learning motivation frustration, learning environment frustration, test frustration, learning

stress frustration, learning adaptation frustration, and learning confidence frustration. Respondents rate each item using a five-point scale, ranging from 1 (completely disagree) to 5 (completely agree). A high total score indicates a high level of academic frustration. Cronbach's α for the total questionnaire in the present study was 0.92.

Core competencies questionnaire

This questionnaire is based on Lin's (2017) construct of Chinese students' core development literacy, and further revised by Zhang (2020). The questionnaire uses 43 items to measure nine factors: literacy achievement, esthetic sentiment, rational thinking, enjoyment of learning, self-reflection, self-management, national identity, national understanding, and problem-solving. Respondents rate each item using a five-point scale, ranging from 1 (completely disagree) to 5 (completely agree). A high total score indicates a high core competence. Cronbach's α for the total questionnaire in the present study was 0.96.

Simple coping style questionnaire

The simple coping style questionnaire (SCSQ) was developed by Xie (1998) and comprises 20 items. Twelve items measure positive coping, and eight items measure negative coping. Respondents rate each item using a four-point scale, ranging from 1 (completely disagree) to 4 (completely agree). As we were considering positive and negative coping styles separately, we calculated the Cronbach's α on each of these two dimensions. The Cronbach's α for the two dimensions of the questionnaire in the current study was 0.76 and 0.78, respectively.

Statistical processing

The current study used SPSS 22.0 and the PROCESS macro provided by Hayes (2012) for the data analysis.

Testing for common method biases

The present study adopted Harman's single-factor test to examine common method biases. Exploratory factor analysis showed that 31 factors had an eigenvalue higher than 1. The first factor explained 16.01% of the total variation, far less than the cutoff value of 40% (Podsakoff et al., 2003). Therefore, no apparent common method biases were evident in the present study.

Results

Description and correlational analysis

As shown in Table 2, academic frustration was significantly negatively related to anti-frustration ability and positive coping style ($p<0.001$), and significantly positively related to core competence and negative coping style. Core competence was positively related to positive coping style and negatively related to negative coping style.

Testing for moderated mediated model

Using the standardized variables, we used the SPSS PROCESS macro by Hayes (2012) to analyze core competence as a mediator

1 <http://www.wjx.cn>

TABLE 2 Descriptive statistics of variables and their correlations ($n=1,500$).

	$M \pm SD$	1	2	3	4	5
(1) Anti-frustration ability	3.52 ± 0.56	–				
(2) Academic frustration	2.77 ± 0.54	-0.38^{***}	–			
(3) Core competence	3.25 ± 0.61	0.28^{***}	-0.34^{***}	–		
(4) Positive coping style	1.87 ± 0.43	0.36^{***}	-0.19^{***}	0.35^{***}	–	
(5) Negative coping style	1.34 ± 0.56	-0.20^{***}	0.25^{***}	-0.13^{***}	0.17^{***}	–

*** $p < 0.001$.

TABLE 3 Predictors for academic frustration using core competence as mediator.

Variables	Academic frustration		Core competence		Academic frustration	
	β	t	β	t	β	t
Anti-frustration ability	-0.38	-15.73^{***}	0.28	11.37^{***}	-0.30	-12.63^{***}
Core Competence					-0.26	-10.77^{***}
R^2	0.14		0.08		0.20	
F	247.47^{***}		129.27^{***}		191.17^{***}	

*** $p < 0.001$.

between anti-frustration ability and academic frustration. The linear regressions are shown in Table 3, and the mediating model is shown in Figure 2.

Table 3 shows that AFA can significantly positively predict core competence ($\beta = 0.28$, $t = 11.37$, $p < 0.001$) and negatively predict academic frustration ($\beta = -0.30$, $t = -12.63$, $p < 0.001$). Furthermore, core competence significantly negatively predicts academic frustration ($\beta = -0.26$, $t = -10.77$, $p < 0.001$).

A non-parametric percentile bootstrap was conducted to examine the mediating effects, as shown in Table 4. Bias-corrected 95% confidence intervals on 5,000 bootstrap samples were estimated for all tests of the total effect, direct effect, and indirect effect. All of the 95% CIs did not include zero, which suggests that AFA could affect AF both directly and indirectly through the mediating role of CC.

Model 4 of the PROCESS macro (Hayes, 2012) was used to examine CS as the moderator. CS was estimated by calculating the difference of the standardized positive and negative coping scores. A positive difference value suggested that one was moving toward adopting a positive coping style, while a negative result suggested one was moving to adopt a negative coping style (Dai, 2010). The results indicated that the combined predicting effect of CC and CS on AF was statistically significant (Table 5).

To further understand the interacting effects of CC and CS on AF, we followed Fang et al.'s (2015) procedure with regard to conducting a simple slope analysis on significant interaction. First, we labeled high CS and low CS groups according to whether the participant scored higher or lower than the standardized mean. Then, the simple slopes of their CC predicting AF of the two groups were calculated separately. The results are shown in Figure 3.

In both groups, CC was shown to negatively predict AF. However, the predicting effect size of the high CS group ($\beta = -0.26$, $t = -8.06$, $p < 0.001$) was much larger than that of the low CS group ($\beta = -0.17$, $t = -4.81$, $p < 0.001$). This indicated that adopting a positive coping style could enhance the effect size of CC in predicting AF, which suggested a mediating effect of CC between the undergraduates' AFA and AF (Table 6).

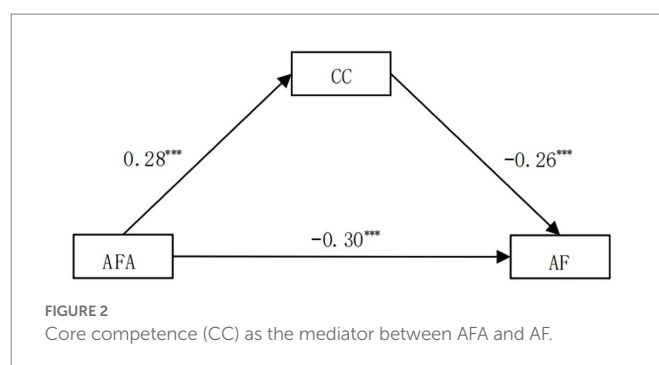


TABLE 4 Core competence as a mediator between AFA and AF (5,000 bootstrap samples).

Effect type	Effect value	BootSE	95%CI
Total effect	-0.38	0.03	$[-0.43, -0.33]$
Direct effect	-0.30	0.03	$[-0.35, -0.26]$
Indirect effect	-0.08	0.01	$[-0.09, -0.05]$

Discussion

The mediating effect of core competence

The present study first showed that AFA could facilitate undergraduates' ability to deal with their AF, replicating results of previous studies (e.g., Li et al., 2019; Yang et al., 2021), thus verifying H1. AFA is a psychological resource that functions as a protective factor, e.g., induces more positive emotions (Wang et al., 2006). According to the broaden-and-build theory (Fredrickson, 2013), positive emotion allows individuals to broaden their attention, cognition, and behavior, enabling them to more keenly observe the existing world and more effectively observe and analyze relevant information during moments of difficulty (Contractor et al., 2021). Positive emotions help individuals increase

TABLE 5 Testing for moderated mediation model.

Variables	CC		AF	
	β	t	β	t
AFA	0.28	11.37***	−0.24	−9.43***
CC			−0.22	−8.64***
CS			−0.12	−5.74***
AFA × CS			−0.04	−2.03*
R^2	0.08		0.22	
F	129.27***		107.09***	

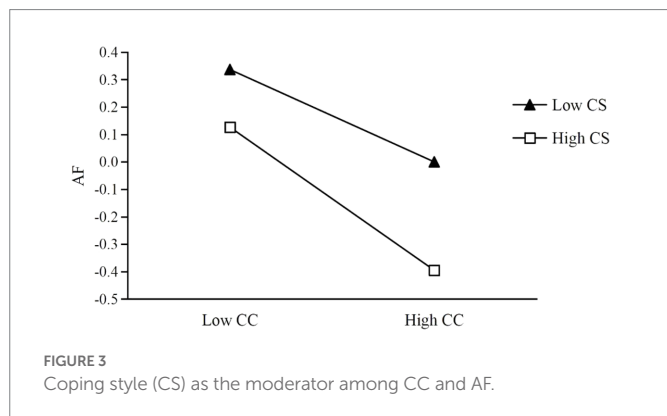
* $p < 0.05$, *** $p < 0.001$.

TABLE 6 Different mediating effects of different CS.

	CS	Effect value	BootSE	95%CI
The mediating effect of CC	−1.29(M − 1SD)	−0.05	0.01	[−0.07, −0.03]
	0.00(M)	−0.06	0.01	[−0.08, −0.04]
	+1.29(M + 1SD)	−0.07	0.01	[−0.10, −0.05]

their achievement goals related knowledge and experience, thus inspiring newer models of thought, developing new problem-solving models, and allowing them to adopt a positive CS in order to deal with frustrations (Wolkenstein et al., 2022). Positive emotions also facilitate the correction, adjustment, and dispelling of the prolonged impact of negative emotions. Therefore, students with higher levels of AFA tend to have fewer negative emotions, e.g., AF.

Furthermore, our findings showed that AFA could not only directly affect AF, but that it also had an impact through the effect of CC. In other words, AFA positively predicted undergraduates' CC, and CC positively predicted their AF, thus verifying H2. The results in the present study indicate that CC partly mediates the relationship between undergraduates' AFA and their AF. CC is the essential and stable ability that enables one to adapt to the changing world around them, which provides them with long-term supportive strength (Wiek et al., 2011). The mediation model of CC could also be explained by the broaden-and-build theory: positive emotions induced by AFA allows students to build and strengthen their sustainable resources, e.g., CC, which would become an integral part of future actions and relieving their levels of stress or frustration (Fredrickson, 2013; Peng et al., 2014). In the midst of difficulties, one who tended to focus on the events of frustration would narrow their attention and cognition, limit their behavior, and lead to admitting their failure and feelings of hopelessness, thus become

deeply trapped in frustration. To alleviate the prolonged effect of frustration, then, individuals can engage AFA, such as seeking out broader resources (e.g., CC) in an effort to support themselves. Positive emotion, broadmindedness, and the development of one's resources all work together interactively. For example, positive emotion can broaden one's attention and cognition, which thereby benefits them by allowing them to better deal with challenges and strengthen their resources which, in turn, enables them to further develop their positive emotions (Gao and Tong, 2010).

Specifically, CC plays an important role in alleviating undergraduates' AF. When undergraduates transition to university, they gain unprecedented freedom and independence, but this means that they must learn to make their own decisions and career plans and learn to manage themselves effectively. Students with high levels of CC tend to form clear learning goals before beginning learning activities, develop a detailed study plan in preparation of the learning, and integrate self-monitoring and feedback to adjust and adapt their learning process and methods (Guo and Ji, 2019; Usán et al., 2022). Students with high levels of CC are able to make positive choices while having strong planning and execution skills, allowing them to move forward toward established goals thanks to their strict self-discipline (Wang and Zhao, 2018). Meanwhile, students with low levels of CC often manifest as poor self-control, inability to concentrate on learning, and low learning efficiency, all of which lead to unsatisfactory study results and a greater feeling of learning pressure. In the face of exam failure and academic difficulties, it quickly becomes difficult to adjust one's emotions and mentality in a timely fashion, leading these undergraduates to become prone to a high level of AF. Therefore, undergraduates with high CC will experience less AF.

To relieve AF, Veronen and Kilpatrick (1982) stated that the stress inoculation training (SIT) could improve AFA and effectively alleviate one's level of AF. According to Veronen and Kilpatrick (1982), the SIT operates from artificially creating a frustration situation and continuously enables students to overcome frustration under the guidance of authority (such as teachers), creating an invisible antibody to frustration psychologically. Meanwhile, AF could also be relieved with the improvement of CC, which could be achieved by setting clear learning goals, making full use of resources from the outside world, etc.

Coping style as moderator

Our results indicate that CS plays a moderating role in the latter half of the mediating model: AFA → CC → AF. In other words, CS moderated the relationship between CC and AF. Specifically, students with a positive CS will generally experience a lower level of AF in comparison to those with a negative CS. Nevertheless, those with low CC will experience a higher level of AF if they concurrently employ a negative CS. In contrast, those with high CC will experience the lowest level of AF if they simultaneously employ a positive CS. A possible reason for this might be that a negative CS tends to result in the individual losing confidence and feeling powerlessness, which limits the function of their CC and makes them vulnerable to the trap of AF.

Students with negative CS tend to deal with their problems by lowering their expectations and self-handicapping. This further inhibits their CC, and their negative coping abilities and inadequate resources to handle stressors further exacerbate their frustration and weaken their resilience. However, positive CS helps individuals experience more positive emotions when confronted with negative events, allowing them

to evaluate events in a more positive way, buffering potential negative impacts (Yin et al., 2010). Those with a positive CS tend to adopt more effective problem-solving tactics and seek help from others, leading to better-functioning CC as they deal with frustration and stress, thereby assisting them in reducing potential negative emotions triggered by AF. Positive CS has a psychological construction effect that can trigger more positive emotion and help one recover psychological resources inhibited by frustration (Noorbakhsh et al., 2010). In other words, the essence of positive CS is to utilize the possible resource to buff the negative effect of frustration and, in this process, CC functions to amplify and provide the supportive energy. Even individuals with low CC may benefit from adopting a positive CS, as it can to some extent further boost their AFA.

There is a never-ending need for new talent and CC that integrates values, attitudes, emotions, skills, and knowledge is essential for students' development, helping them adapt to changing social settings and achieve success. The cognitive interaction theory of stress indicates that one's choice of CS is influenced by cognitive evaluation. When facing a stressful situation, one should consider whether they can effectively overcome the stressors based on their own personal reserves and resources, while also taking into account their capabilities and style of problem-solving as well. When one fears their personal resources may not be strong enough to cope with external threatening events, they have a tendency to fear the potential difficulties ahead and, in response, adopt more negative coping methods such as avoidance or evasion responsibility (Zhu et al., 2022). According to the theory, undergraduates with stronger CC are more likely to have stronger all-round development, and be more likely to adopt positive coping methods in the face of difficulties and stress. Those adopting positive coping strategies will tend to deal with the problem at hand rather than try to escape it or fall into emotional distress. If undergraduates learn to adopt task-oriented coping methods, they will likely suffer less frustration in their studies, and therefore achieve better academic performance (Khorasani and Ghanizadeh, 2017).

Limitations and future research

Despite the contributions of our findings to the current understandings of the mechanisms at play between AFA and AF, there are nonetheless some limitations to this study. First, the different grade demographics in the sample was not balanced. Most of the sample was made up of freshmen and sophomores, which can have been a result of the random distribution of questionnaires. Also, the sampling of academic performance was not balanced. Most of the sample were in the middle third of the class in terms of academic achievement. This could have been due to random sampling, or to the “*zhongyong*” (Doctrine of the Mean, which prefers harmony and avoids extremities, see Yang et al., 2016; Fan, 2021) nature of the Chinese. Future studies should adopt a more rigorous design, and consideration of how to distribute the questionnaires effectively should be determined before beginning the study, so as to improve the data quality. Second, the four scales contained a relatively large number of questions, and respondents may have grown tired before completing all questionnaires, which may have led to errors between the measured data and reality. Future research should endeavor to develop shorter but nonetheless effective questionnaire forms. Third, data analysis techniques in this study were limited to several common traditional analysis methods. In the future, similar studies should explore the data further and deeper. Last but not

least, the concepts of AF, AFA, and CC are all relatively new at this point, so there is a lack of appropriate literature explaining the relationship between these, as well as the mechanisms at play between variables. However, we considered this to be an important innovation of the current study, to put forward these concepts. Furthermore, we welcome future studies in the same vein for further validation of our results.

Conclusion

To the undergraduates, their AFA might lead to alleviating AF and this process is partly mediated by CC. In comparison with negative CS, positive CS employed by undergraduates might help alleviate their AF to a larger extent with the mediation of CC.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by XZ, Zhaoqing University. The patients/participants provided their written informed consent to participate in this study.

Author contributions

MW: investigation, data analysis, and original draft. HH: conceptualization, data collection, and translation. YF: conceptualization, data analysis, and supervision. XZ: data collection, and review and editing. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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