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PROTEUS - promoting success in university: a results assessment

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Introduction: The promotion of success in higher education has been extensively researched, with decades of studies contributing to a substantial body of knowledge on the topic. Research indicates that reducing dropout rates and fostering academic success require a comprehensive understanding of the intricate interactions between individual, social, and institutional factors. Specifically, regarding institutional factors, it is important to enhance resources, facilitating both academic and social integration, and promoting students' motivation and skill development as key areas for intervention. While some factors influencing student success may lie beyond the control of higher education institutions, there are critical aspects that can be shaped to create a more supportive environment conducive to student achievement.

Method: This paper outlines a series of initiatives designed in line with these findings and tailored to the institutional context in which they were implemented. These efforts are part of the PROTEUS project — Promoting Success in University — funded by Portugal's Directorate General for Higher Education. It also presents results from a quantitative study evaluating two distinct cohorts of first-year students: one group assessed prior to the implementation of these initiatives (Wave 1; $n = 265$), and a separate group assessed after their implementation (Wave 2; $n = 115$). The evaluations in both waves focused on key areas such as academic experiences, overall well-being, psychological well-being, and health behaviors.

Results: Results indicate that in comparison to the pre-intervention cohort (Wave 1), students in the post-intervention cohort (Wave 2) reported improvements in academic integration, psychological well-being, and health-related behaviors.

Discussion: These findings suggest that the PROTEUS project contributed to a more supportive academic environment and enhanced student outcomes. The main conclusion is that targeted institutional interventions can effectively promote student success and reduce dropout risk.

KEYWORDS

Portugal, higher education, academic success, PROTEUS project, quantitative study

Introduction

Promoting success in higher education and reducing school dropout rates have been the focus of many studies, with recent meta-analyses systematizing decades of knowledge on the subject (e.g., Aina et al., 2022; Alyahyan and Düşteğör, 2020; Kehm et al., 2019; Ifenthaler and Yau, 2020; Mishra, 2020). Within this scope, several definitions of academic

success can be found. For example, [Kuh et al. \(2006\)](#) propose that student success can be defined by academic achievement, engagement in educational activities, satisfaction, acquisition of desired knowledge, skills and competences, persistence, attainment of educational outcomes and postgraduate performance. A simpler definition is suggested by [York et al. \(2015\)](#), who focus on six key components: academic achievement, satisfaction, acquisition of skills and competencies, persistence, realization of learning goals, and career success. Regarding the concept of school dropout in higher education, it is recognized as a complex, multifaceted, and multidetermined issue. Operationally, it has been defined as students leaving university before completing the degree in which they enrolled ([Kehm et al., 2019](#)).

For decades, research has aimed to identify the factors that explain student dropouts at universities. For example, the classic Student Integration Model ([Tinto, 1975, 2021](#)) posits the student's social and academic integration are determining factors in this process, emphasizing the interaction between student's characteristics and the university structure as a central element. Tinto acknowledges the existence of factors outside the university that contribute to dropout but considers them indirect influences.

Later, [Heublein et al. \(2003, 2010\)](#) refined this model, explicitly emphasizing the factors outside university that are relevant in this context. These factors include: (a) pre-university factors, such as sociodemographic background, study prerequisites, and choice of course/university; (b) factors intrinsic to the university phase, such as learning potential, cognitive resources, motivation, integration, and study conditions; and (c) factors influencing the decision-making phase regarding whether to stay at or leave the university, such as the availability of counseling services.

From the analysis of 44 empirical studies conducted by [Kehm et al. \(2019\)](#), nine factors influencing students' decisions to stay, change courses/institutions, or leave higher education were identified: study conditions at university, academic integration, social integration, personal efforts and motivation to study, information and admission requirements, academic performance prior to university, students' personal characteristics, socio-demographic background, and external conditions. The first dimension - university study conditions - includes a set of controllable factors with the potential to reduce the risk of dropout. Key institutional resources should be emphasized, such as the number of students per class, the qualification level of staff, the staff-student ratio, and students' academic expenses. Generally, better resources correlate with a lower risk of dropout. Additionally, the quality of the learning environment has significant explanatory power in dropout decisions. Social and academic integration at university, on the other hand, have been shown to be influenced in part by both institutional and student characteristics. They are also linked, to some extent, to the quality of the learning environment - which includes aspects of well-being - making it one of the most critical factors in the decision to drop out or change courses.

Regardless of the dimensions involved and the underlying reasons, dropping out of higher education has consequences at various levels - immediately in terms of faculty evaluations and, above all, for the student leaving university. Students may experience feelings of unease and doubts about their self-image, self-esteem, the time and money they have invested, and the decisions they have made. These personal - and consequently,

family - consequences can be even more significant for international students who have left their home countries to study.

In recent years, research has continued to explore the best pathways to university student success (e.g., [Aina et al., 2022](#); [Alyahyan and Düşteğör, 2020](#); [Casanova et al., 2022](#); [Kehm et al., 2019](#); [Ifenthaler and Yau, 2020](#); [Mishra, 2020](#); [Tomaszewski et al., 2022](#); [Zhao et al., 2024](#)). Generally speaking, the literature suggests that a wide range of interacting personal and social attributes, along with institutional practices, influence retention rates and academic performance. It has become evident that strategies to mitigate dropout must be based on a robust understanding of the underlying causes, prioritizing academic and social integration while also fostering students' motivation and skills. While it is true that many of the variables affecting student success are beyond institutional control (such as family background, personal circumstances, or financial issues), there are several aspects that can be influenced. For example, universities can provide academic support, mental health resources, a welcoming and inclusive campus environment, and opportunities for student engagement. By focusing on these aspects, institutions can help create a more supportive environment that promotes student success and well-being.

Building upon existing efforts at a values-driven institution committed to ethical principles and student welfare, additional resources would be beneficial. The institution's environment, recognized for its high academic standards and quality of teaching, provides a supportive and relevant setting for the outlined project's goals and activities. This framework is especially conducive to fostering positive student expectations, motivation, commitment, and support.

The primary aim of this paper is twofold: (1) to present the PROTEUS project - a set of institutional interventions designed to foster academic success and reduce dropout (funded by the Directorate General for Higher Education, Portugal) - and (2) to quantitatively evaluate the effectiveness of these interventions by comparing two cohorts of first-year students (before and after implementation). Specifically, the study examines the academic experiences (QVar) of university students, evaluating their perceptions across various dimensions (interpersonal, career, institutional, personal, and study/course), as well as their psychological well-being, mental health, perception of life satisfaction, and lifestyle. Additionally, the study explores gender differences in academic experiences and well-being, identifies determinants of QVar, and investigates the primary challenges and strategies associated with academic dropout.

Proteus' project

The context

This higher education institution established in 1967 is dedicated to providing quality education rooted in ethical and humanistic values. With ten different faculties on campus, ensuring high-quality academic experiences is central to our mission. In this regard, the following points stand out: (i) high academic standards and quality teaching, with curricula designed to offer solid and up-to-date training, preparing students to face the challenges of the job market; (ii) highly qualified faculty, composed

of specialized and experienced professors in their respective fields of teaching and research; (iii) adequate infrastructure and resources, providing a conducive learning environment with laboratories, libraries, study spaces, updated technology, and technological resources to support learning and research; (iv) emphasis on internationalization, providing various opportunities for academic exchange, mobility programs, and partnerships with educational institutions worldwide; (v) strong connection with the job market, promoting internships, partnerships with companies and institutions, networking events, and other initiatives to facilitate students' transition to the professional world; and, (vii) commitment to values and holistic student development, fostering personal growth, respect for human dignity, social responsibility, and the pursuit of the common good.

As previously mentioned, even with the substantial foundations already in place at this institution - which underpin the PROTEUS project - there remains potential for further advancement in academic success, especially regarding student expectations, motivation, commitment, and support. In this study, success is operationalized as a multidimensional construct, encompassing academic achievement, persistence, satisfaction with academic experiences, acquisition of relevant skills, and indicators of psychological and overall well-being, in line with the frameworks proposed by [Kuh et al. \(2006\)](#) and [York et al. \(2015\)](#).

The project: PROTEUS

This project aimed to promote academic success in higher education by developing a set of mechanisms to reduce dropout rates and academic failure while facilitating students' transition, integration, and adaptation at this educational level.

The project's name, PROTEUS, was chosen as a reference to the figure from Greek mythology who possessed the ability to metamorphose, transforming his physical form to evade his enemies. In this sense, we believe the project can support higher education students in developing their own ability to adapt and transform, fostering better integration and resilience.

The proposed project comprised a series of actions and outputs, which are detailed below.

Creation of the proteus office

A campus within the university has established an office dedicated to the academic support and integration of first-year students, while also welcoming students from other years and academic levels. This office is staffed by a full-time faculty member who serves as the Office Coordinator, a support secretary, and two project managers. The PROTEUS Office offers a scheduling system for in-person or online sessions through a dedicated email address created for this purpose.

Preparation of a student welcome manual for higher education

This manual is designed to support first-year undergraduate students in their integration and adaptation to university life. It was

created through the collaboration of 19 faculty members, each of whom is an expert in the relevant topics. The manual comprises 20 chapters that cover a range of subjects, including: Challenges of the Transition to Higher Education (e.g., moving out of parents' home, managing homesickness, balancing household tasks with studies, increased responsibilities in learning, etc.); Healthy living habits; Learning to think; Generating and maintaining motivation; Attention, concentration, and memory; Study methods; Time management and procrastination; Technological tools for work management; Academic ethics: Plagiarism; Oral and written communication; Managing anxiety and stress; Friendships in university; Investing in internationalization; Boosting career prospects during higher education. The manual has been distributed to first-year students in the 2023/24 and 2024/25 academic years in both Portuguese and English.

Conducting workshops for students

The cycle of workshops designed to facilitate the transition and adaptation to higher education commenced with a conference titled "Challenges in transitioning to higher education: the PROTEUS project, which attracted students and faculty professors. Subsequent to this event, a total of five workshops were organized to address key topics from the welcome guide in a practical, creative, and dynamic manner. These workshops were developed and facilitated by faculty experts in their respective fields, covering the following themes: Study methods, habits, and time management; Psychological flexibility and well-being in higher education; Sleep to succeed; Emotional self-regulation; Coping with anxiety and stress during assessment periods. Each workshop offered ECTS (European Credit Transfer and Accumulation System) to students who attended four out of five workshops per semester, serving as an incentive for participation. The second edition of the initiative consisted of three workshops in a hybrid format, covering the following topics: Digital technologies in learning; Relationships with peers; and discovering potential. The workshop on "discovering potential" was held exclusively online and was open to the entire university community.

Tutoring and mentoring programs

The tutoring process entails a relationship between a teacher-tutor and a student-tutee that goes beyond the traditional teaching-learning dynamic. A mentoring process refers to the relationship between a mentor (a more advanced student in their study cycle) and a mentee (a newcomer to the university), extending beyond typical colleague or friend interactions. Through these programs, the PROTEUS project aimed to offer additional support for the transition and adaptation of newly arrived students to the university. During the first semester of the 2023/24 academic year, each new undergraduate student at this campus was assigned a teacher-tutor, alongside a student-mentor, preferably a third-year student from the same degree program. To facilitate this process, all undergraduate programs - including Communication and Cultural Studies, Nursing, Psychology, Social Work, Philosophy, Politics and Economics, Business, Political Science, and International Relations

- were contacted to identify potential mentors and tutors who possessed the necessary qualifications and attributes for these roles. Subsequently, tutors and mentors were paired with their respective tutees and mentees to ensure ongoing support for new students throughout their journey at the university. To enhance these experiences, a tutoring manual (for tutors and tutees) and a mentoring manual (for mentors and mentees) were developed and made available to all participants involved in these activities during the 2023/24 academic year.

Dissemination of “nudges” at the campus

To promote the PROTEUS Office, a set of “nudges” was created to be strategically placed in key locations around the campus. These locations were chosen for their accessibility to students and faculty (for example, the campus cafes). These “nudges” (displayed as hangers) aimed to encourage actions that foster student engagement in activities promoting academic success (such as those proposed here) and the timely seeking of support in challenging situations, specifically by scheduling a session at the PROTEUS Office. Examples of the “nudges” include: “Not every day is easy. It’s good to know that here, we are not alone”; “Higher education is an opportunity for discovery and growth”; “Your potential knows no bounds. PROTEUS helps you achieve it”; “PROTEUS – together, adapting to higher education is easier”; “More than just an office, PROTEUS is a space for support and collaboration.”

Welcome letters

Some degree coordinators were tasked with finding students who could write welcome letters in order to facilitate the adjustment and integration of incoming students in the 2024/25 academic year. A few letters were received from students studying Psychology and Social and Cultural Communication in response to invitation emails. For the 2024/25 academic year, a PROTEUS information leaflet was created to accompany the letters that were distributed in the New Student Welcome Kit.

Optional curricular unity

A new optional curricular unit named “Emotional Skills Lab” was created with the intention of encouraging students to strengthen their socioemotional skills. Following its submission and approval by the Psychology course’s scientific coordination, the proposed curriculum was made available to all students, national and foreign, starting in the 2024/25 academic year. To accommodate international student, the course is taught in English. The following topics are covered within the course’s established learning objectives: (i) comprehending the concept, historical development, scientific underpinnings, and theoretical models of socio-emotional competencies in their entirety; (ii) develop emotional intelligence and self-control; (iii) establish objectives with purpose and clarity; (iv) fostering constructive relationships with oneself, other people, and society; (v) use the concepts of socio-emotional competencies in a variety of settings, including community, society, academic and professional life, and personal well-being; (vi) maintain emotional health throughout one’s life.

Videos

Five videos, each corresponding to a workshop in the first edition, were produced by adapting the workshop material into video format. These videos cover topics such as: Study techniques, habits, and time management; Psychological flexibility and well-being in higher education; Sleep for success; Emotional self-regulation; and Managing stress and anxiety during assessment periods. Presented in a whiteboard animation format, these videos have an average duration of 3 min. Upon completion of the project, the academic community will have access to these audiovisual materials, serving as a lasting resource.

Materials and method

Participants

Wave 1

The first study included 265 first-year undergraduate students, with an average age of 18.76 years ($SD = 1.93$; range: 17–44). Of these, 99.4% were unmarried, and the majority identified as female (80.4%), compared to male (19.6%). The average admission grade to university was 15.62 ($SD = 1.42$; range: 11–19.3). Regarding prior higher education experience, 17.4% of respondents reported previous attendance, compared to 82.6% with no prior experience. In terms of employment status, the majority (77.7%) were solely students, while 12.8% worked occasionally, 6.8% part-time, 2.6% on weekends, and 0.4% full-time. On average, participants had 56.23€ ($SD = 134.06$ €; range: 0–2000€) available weekly for non-essential spending, such as entertainment, clothing, electronics, and dining out. About 1.9% of respondents said they were the primary person in charge of home expenses, while 93.2% said they weren’t; 1.9% had children under the age of 18, while 98.1% had none; 74% of students did not experience displacement from their place of residence, whereas 26% did. 31.7% of respondents said that their fathers had a bachelor’s degree, 29.4% had finished secondary school, 22.3% had a master’s degree, 9.8% had a doctorate, 6% only had a basic education, and 0.8% had no formal education. Regarding their mothers, 41.5% had a bachelor’s degree, 29.4% had a master’s degree, 20% had completed secondary school, 6% had a PhD, 2.6% had only a basic education, and 0.4% claimed that the category did not apply.

Wave 2

For the second investigation, a total of 115 valid responses were gathered. Participants had a mean age of 19.37 years ($SD = 1.03$; range: 18–27), with the majority identifying as female (88.7%) and a smaller proportion as male (11.3%). All participants were unmarried. The average university admission grade was 15.53 ($SD = 1.55$; range: 11.8–19). At the time of data collection, most participants (75.7%) were exclusively students, while 8.7% worked occasionally, 5.2% on weekends, and 1.7% full-time. Regarding financial responsibilities, 6.1% were responsible for household expenses, compared to 93.9% who were not. The mean weekly amount available for non-essential expenses (e.g., entertainment, clothing, electronics, and dining out) was 52.90€ ($SD = 81.01$; range: 0–800€). All participants (100%) reported having no children under

the age of 18. Approximately 29.6% had relocated from their parental home, while 70.4% had not. When asked about their fathers' highest educational attainment, 33% reported secondary school, 31.3% a bachelor's degree, 20.9% a master's degree, 7% a secondary school qualification, and 7% a PhD, with 0.9% indicating "not applicable." For mothers' education, 43.5% had attained a bachelor's degree, 24.3% a master's degree, 20.9% secondary school, 8.7% a doctorate, and 2.6% basic schooling.

Instruments

The research protocol used in this study was designed for a comprehensive assessment of the challenges students encounter during their transition to higher education. The aim was to identify factors influencing academic success, persistence, and overall well-being. It comprised several sections encompassing sociodemographic characteristics, academic experiences, psychological health, and lifestyle habits.

Sociodemographic characteristics

This section gathered data on participants' backgrounds, including gender, age, marital status, current program of study, high school final grade, prior experience in higher education, and employment status (categorized as: student only, occasional work, part-time, weekend, or full-time). Family characteristics, such as responsibility for household expenses and the presence of children under 18 years of age, were also collected.

Academic experiences

The *Questionário de Vivências Acadêmicas – versão reduzida* [Student Academic Life Questionnaire – brief version] (QVA-r) (Almeida et al., 1999) was used to evaluate students' perceptions and experiences within their academic environment. This validated instrument measures five dimensions: (1) Interpersonal (e.g., "I make friends easily at my university."; Wave 1 | (α) = 0.863; Wave 2 | (α) = 0.871); (2) Career (e.g., "I believe I can achieve my values (prestige, stability, solidarity.) in the career I have chosen."; Wave 1 | (α) = 0.842; Wave 2 | (α) = 0.883); (3) Institutional (e.g., "Even if I could, I would not change universities."; Wave 1 | (α) = 0.660; Wave 2 | (α) = 0.732); (4) Personal (e.g., "I experience mood swings."; Wave 1 | (α) = 0.869; Wave 2 | (α) = 0.904); and (5) Study/Course (e.g., "I manage my time effectively."; Wave 1 | (α) = 0.859; Wave 2 | (α) = 0.848). These items are rated on a 5-point Likert scale to quantify student experiences (1 = "Nothing in accordance with me, totally in disagreement, never occurs" to 5 = "Totally in accordance with me, totally in agreement, always occurs").

Psychological health

The Portuguese version of DASS-21 (Depression, Anxiety and Stress Scale; Pais-Ribeiro et al., 2004) was used to evaluate the presence of symptoms related to depression (e.g., "I felt sad and depressed."; Wave 1 | (α) = 0.844; Wave 2 | (α) = 0.907), anxiety (e.g., "I felt my mouth dry."; Wave 1 | (α) = 0.913; Wave 2 | (α) = 0.783), and stress (e.g., "I had difficulty calming down."; Wave 1 | (α) = 0.870; Wave 2 | (α) = 0.889). This widely used 21-item scale utilizes a 4-point Likert format (1 = "Did not apply to me at all"; 4 = "Applied to me most of the time").

Well-being index

The WHO-5 (World Health Organization [WHO], 1998) was used to assess overall well-being, including mood, vitality, and interest in daily activities (e.g., "I felt happy and well."; Wave 1 | (α) = 0.783; Wave 2 | (α) = 0.806), measured on a 6-point Likert-type scale (1 = "Never" to 6 = "All the time").

Perceived life satisfaction

A single item assessed overall perceived life satisfaction using an 11-point Likert scale (0 = *Totally dissatisfied*; 10 = *Totally satisfied*) (Gaspar et al., 2022).

Lifestyle habits and health behaviors (Gaspar et al., 2022), which includes: (i) Aerobic Activity: Participants reported the average number of hours per week and weekend engaged in aerobic exercise (in a 5 point-Likert scale, options ranged from 1 = "I do not practice any aerobic activity" to 5 = "More than 5 h per week"); Sleep Patterns: Average nightly sleep duration during the week and weekends was assessed (in a 4 point-Likert scale, options ranged from 1 = "Less than 4 h" to 4 = "10 h or more"); Screen Time: Daily time spent in front of screens (excluding study/work) was recorded, differentiating between weekdays and weekends in a 7 point-Likert scale (options ranged from 1 = "I do not spend time on the screen" to 7 = "8 or more hours per day").

Health risk behaviors (Gaspar et al., 2022), which includes: (i) Tobacco Use: Number of cigarettes smoked per day on weekdays and weekends (7 point-Likert scale, options ranged from 1 = "I never smoke" to 7 = "More than 40 cigarettes"); and, (ii) Alcohol Consumption: Weekly alcohol consumption was assessed using an 8-point Likert scale for weekdays (1 = "I do not drink" to 8 = "Every day") and a 3-point Likert scale for weekends (1 = "I do not drink" to 3 = "Two days").

Open-ended questions

Two open-ended questions explored: (i) Reasons for Academic Dropout: Participants were asked to identify the three main reasons for academic dropout during the first year of undergraduate studies; and, (ii) Strategies for Addressing Challenges: Participants were asked to suggest strategies for overcoming the challenges identified in the previous question.

Data collection and data analyses procedures

This study was approved by the Ethics Committee of the University on December 15, 2023 (Opinion CETCH2023-63). Data collection took place in two phases, corresponding to the 2023/2024 and 2024/2025 school years.

This study aimed to provide a detailed and quantifiable perspective on students' experiences during their transition, integration, and adaptation to higher education, with a focus on indicators of success and failure. Data collection, conducted initially from January to March 2024, encompassed sociodemographic factors (personal, family, economic), academic performance, and responses to questionnaires measuring academic experiences, overall well-being, psychological well-being, and health and risk behaviors. At the beginning of the second academic year (October 2024), the questionnaires were re-administered to

the same student cohort, comprising participants from programs such as Social and Cultural Communication, Social Work, Applied Foreign Languages, Philosophy, Politics and Economics, Nursing, and Psychology. Data were collected in person, in the students' classrooms, in the presence of a researcher.

Given that the subjects were not necessarily the same at both time points, two separate investigations were conducted, corresponding to Waves 1 and 2. Separate analyses were justified because participants' reduction in Wave 2 may affect the representativeness and statistical power of the results. Moreover, direct comparability between the Waves may have been compromised by potential participant influences from contextual, institutional, or curriculum elements during the two data collection periods. Consequently, conducting two separate investigations ensures that the outcomes accurately represent the unique features of each sample without assuming continuity between data collection points and mitigates the introduction of confounding variables.

To ensure a thorough analysis, descriptive statistics were performed on the study variables, along with Spearman's correlation analyses, Mann-Whitney U tests to investigate gender differences, and multiple linear regressions to assess the predictive value of various dimensions of academic experiences. Non-parametric tests were preferred due to the non-normal distribution of data for several variables, making it a suitable non-parametric alternative for comparing differences between two independent groups. Statistical significance was set at 0.05.

Results

Wave 1

Descriptive statistics

The descriptive results of the dimensions under study are shown in Table 1.

The average scores for the various academic experiences (QVar) aspects varied from 3.15 (personal dimension, $SD = 0.73$) to 4.01 (career dimension, $SD = 0.63$). Interpersonal dimension had a mean of 3.72 ($SD = 0.69$), while institutional's dimension mean was 3.76 ($SD = 0.57$). Study/Course dimension obtained a mean score of 3.35 ($SD = 0.65$). The Well-being Index (WHO-5) presented a mean score of 3.29 ($SD = 0.82$). The average levels of psychological symptoms measured by the DASS-21 ranged from 1.66 (depression, $SD = 0.58$) to 1.72 (anxiety, $SD = 0.58$) and 2.06 (stress, $SD = 0.65$). Perceived life satisfaction averaged 7.09 ($SD = 1.56$). Aerobic activity presented a mean of 2.77 ($SD = 1.29$) during the week and 2.11 ($SD = 1.06$) during the weekend. Sleep patterns averaged 2.51 ($SD = 0.53$) throughout the week and 3.18 ($SD = 0.56$) on weekends. Screen time had a mean of 4.84 ($SD = 1.15$) during the weeks and 4.93 ($SD = 1.17$) on weekends. Breakfast habits averaged 5.66 ($SD = 2.79$) on weekdays and 2.51 ($SD = 0.77$) on weekends. The average score for tobacco usage was 1.58 ($SD = 1.26$) on weekdays and 1.56 ($SD = 1.22$) on weekends. Alcohol consumption averaged 1.69 ($SD = 0.99$) on weekdays and 1.60 ($SD = 0.67$) on weekends.

TABLE 1 Wave 1. Descriptive data of the dimensions under study.

	Wave 1			Min	Max
	N	Mean	SD		
QVar_interpersonal	265	3.72	0.69	1	5
QVar_career	265	4.01	0.63	1	5
QVar_institutional	265	3.76	0.57	1	5
QVar_personal	265	3.15	0.73	1	5
QVar_study_course	265	3.35	0.65	1	5
WHO-5_psychological well-being	265	2.71	0.82	1	6
DASS_stress	265	2.06	0.65	1	4
DASS_depression	265	1.66	0.58	1	4
DASS_anxiety	265	1.72	0.58	1	4
Perceived life satisfaction	265	7.09	1.56	0	10
Aerobic activity_week	265	2.77	1.29	1	5
Aerobic activity_weekend	263	2.11	1.06	1	5
Sleep pattern_week	265	2.51	0.53	1	3
Sleep pattern_weekend	263	3.18	0.56	1	4
Screen time_week	258	4.84	1.15	1	7
Screen time_weekend	256	4.93	1.17	1	7
Breakfast regularity_week	258	5.66	2.79	1	8
Breakfast regularity_weekend	255	2.51	0.77	1	3
Tobacco use_week	258	1.58	1.26	1	7
Tobacco use_weekend	256	1.56	1.22	1	7
Alcohol consumption_week	258	1.69	0.99	1	5
Alcohol consumption_weekend	252	1.60	0.67	1	3

Correlations between the study's dimensions

Spearman's rank correlation coefficient was employed to investigate the associations between: (a) the various dimensions of QVar - namely interpersonal, career, institutional, personal, and study/course domains; (b) the well-being index (WHO-5); and (c) indicators of psychological distress (DASS-21), encompassing symptoms of stress, depression, and anxiety, along with lifestyle factors such as physical activity, sleep habits, screen time, dietary patterns, and substance use.

The results indicated that all QVar dimensions were positively inter-correlated, with correlation coefficients ranging from $r = 0.166$ to $r = 0.582$. Perceived life satisfaction demonstrated statistically significant positive associations with all QVar dimensions ($r = 0.258$ to 0.490).

The Well-being Index (WHO-5) exhibited positive relationships with all QVar dimensions ($r = 0.297$ to 0.570). Furthermore, symptoms of stress, depression, and anxiety (DASS-21) were negatively associated with QVar and perceived life satisfaction. However, these symptom scales showed positive inter-correlations, notably between stress and anxiety ($r = 0.794$) and between stress and depression symptoms ($r = 0.615$).

Regarding physical activity patterns, weekly aerobic exercise displayed positive, albeit weak, correlations with interpersonal and personal QVar dimensions ($r = 0.123$ and $r = 0.109$, respectively). Weekend aerobic activity was negatively correlated with symptoms

of depression and anxiety ($r = -0.165$ and $r = -0.129$, respectively). Weekly sleep patterns showed no significant associations with the variables examined. However, weekend screen time exhibited negative relationships with QVAr dimensions and perceived life satisfaction ($r = -0.124$ to -0.209). Concerning dietary habits, weekday breakfast frequency was positively correlated with QVAr_Study/course ($r = 0.263$). Conversely, weekend breakfast frequency was associated with lower levels of depression symptoms ($r = -0.115$). Finally, tobacco and alcohol use were positively inter-correlated (r -values ranging from 0.279 to 0.621).

Gender differences in the study's dimensions

Variables related to the various dimensions of QVAr - namely interpersonal, career, institutional, personal, and study/course domains, the well-being index (WHO-5), and indicators of psychological distress (DASS-21), encompassing symptoms of stress, depression, and anxiety were included in the gender analysis. Variables related to sleep, screen time, physical activity, and substance use were excluded from further analysis in this study due to their inconsistent relationships with measures of academic experiences and psychological well-being. Moreover, these variables are susceptible to a multitude of extraneous influences.

Table 2 presents the mean ranks and sum of ranks for academic experiences, psychological well-being, and mental health by gender and Table 3 presents the results of the Mann-Whitney U Test for differences in academic experiences, well-Being, and mental health by gender.

Regarding QVAr dimensions, Mann-Whitney U tests revealed significant gender differences in the career ($U = 4234.00$, $Z = -2.63$, $p < 0.01$), personal ($U = 4347.50$, $Z = -2.40$, $p < 0.05$), and study/course ($U = 3945.50$, $Z = -3.22$, $p \leq 0.001$) dimensions. These results indicate that female students reported significantly more positive perceptions in these QVAr domains compared to male students. No significant gender differences were observed for the QVAr_Interpersonal and QVAr_Institutional dimensions.

Similarly, significant gender differences were found for DASS_Stress ($U = 4032.50$, $Z = -3.05$, $p < 0.01$) and DASS_Anxiety symptoms ($U = 4235.50$, $Z = -2.64$, $p < 0.01$). In these cases, female students reported significantly higher levels of stress and anxiety symptoms than male students. In contrast, no significant gender differences were found for DASS_Depression symptoms, WHO-5 scores, or perceived life satisfaction.

QVAr dimensions: multiple linear regressions

Variables related to the various dimensions of QVAr, the well-being index (WHO-5), and indicators of psychological distress (DASS-21), were included in the multiple regression analyses.

For the QVAr_Interpersonal dimension, multiple linear regression analysis revealed that the Well-being Index (WHO-5) ($B = 0.235$, $p < 0.001$) and DASS_Depression ($B = -0.324$, $p < 0.01$) were significant predictors. The model explained 13.3% of the variance in QVAr_Interpersonal (adjusted $R^2 = 0.133$, $F(5, 259) = 9.072$, $p \leq 0.001$). DASS_Stress, DASS_Anxiety, and perceived life satisfaction were not significant predictors in this model (see Table 4). DASS_Stress, DASS_Anxiety, and perceived life satisfaction were not significant predictors in this model (see Table 4).

For the QVAr_Career dimension, multiple linear regression analysis revealed that the DASS_Depression ($B = -0.216$, $p < 0.05$),

TABLE 2 Wave 1. Mann-Whitney U test results: mean ranks and sum of ranks for academic experiences, psychological well-being, and mental health by gender.

	Gender	N	Mean rank	Sum of ranks
QVAr_interpersonal	Male	52	128.01	6656.50
	Female	213	134.22	28588.50
QVAr_career	Male	52	107.92	5612.00
	Female	213	139.12	29633.00
QVAr_institutional	Male	52	123.71	6433.00
	Female	213	135.27	28812.00
QVAr_personal	Male	52	155.89	8106.50
	Female	213	127.41	27138.50
QVAr_study/course	Male	52	102.38	5323.50
	Female	213	140.48	29921.50
WHO-5_well-being index	Male	52	147.31	8102
	Female	213	129.25	27173.00
DASS_stress	Male	52	104.05	5410.50
	Female	213	140.07	29834.50
DASS_depression	Male	52	123.22	6407.50
	Female	213	135.39	28837.50
DASS_anxiety	Male	52	107.95	5613.50
	Female	213	139.12	29631.50
Perceived life satisfaction	Male	52	131.18	6821.50
	Female	213	133.44	28423.50

TABLE 3 Wave 1. Mann-Whitney U test for differences in academic experiences, well-being, and mental health by gender.

Variable	U	Z	W	p
QVAr_interpersonal	5278.50	-0.524	6656.50	n.s.
QVAr_career	4234.00	-2.634	5612.00	<0.01
QVAr_institutional	5055.00	-0.978	6433.00	n.s.
QVAr_personal	4347.50	-2.404	27138.50	<0.05
QVAr_study/course	3945.50	-3.217	5323.50	≤0.001
WHO-5_well-being index	5002.50	-1.560	27143	n.s.
DASS_stress	4032.50	-3.048	5410.50	<0.01
DASS_depression	5029.50	-1.031	6407.50	n.s.
DASS_anxiety	4235.50	-2.639	5613.50	<0.01
Perceived life satisfaction	5443.50	-0.196	6821.50	n.s.

n.s., not significant. Bold values indicate results statistically significant according to $p < 0.05$.

DASS_Anxiety ($B = 0.284$, $p < 0.01$), and perceived life satisfaction ($B = 0.100$, $p \leq 0.01$) were significant predictors. This model explained 14.7% of the variance in the QVAr_Career dimension (adjusted $R^2 = 0.147$, $F(5, 259) = 10.08$, $p \leq 0.001$). The Well-being Index (WHO-5) and DASS_Stress were not a significant predictor in this model (see Table 5).

For the QVAr_Institutional dimension, the linear regression analysis revealed that both the well-being index (WHO-5) and perceived life satisfaction were significant positive predictors.

TABLE 4 Wave 1. Predictors of the academic experiences – interpersonal dimension.

	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
(Constant)	3.156	0.345	—	9.136	<0.001
WHO-5_well-being index	0.235	0.066	0.276	3.575	<0.05
DASS_stress	0.034	0.105	0.032	0.326	n.s.
DASS_depression	−0.324	0.104	−0.263	−3.115	<0.01
DASS_anxiety	0.189	0.115	0.161	1.647	n.s.
Perceived life satisfaction	0.010	0.034	0.022	0.293	n.s.

n.s., not significant. Bold values indicate results statistically significant according to $p < 0.05$.

TABLE 5 Wave 1. Predictors of the academic experiences – career dimension.

	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
(Constant)	2.936	0.318	—	9.223	≤0.001
WHO-5_well-being index	0.109	0.061	0.138	1.806	n.s.
DASS_stress	−0.037	0.097	−0.038	−0.384	n.s.
DASS_depression	−0.216	0.096	−0.189	−2.257	<0.05
DASS_anxiety	0.284	0.106	0.260	2.686	<0.01
Perceived life satisfaction	0.100	0.031	0.241	3.206	≤0.01

n.s., not significant. Bold values indicate results statistically significant according to $p < 0.05$.

TABLE 6 Wave 1. Predictors of the academic experiences – institutional dimension.

	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
(Constant)	2.580	0.254		10.256	<0.001
WHO-5_well-being index	0.245	0.048	0.236	2.991	<0.01
DASS_stress	0.017	0.077	0.022	0.219	n.s.
DASS_depression	−0.012	0.076	−0.014	−0.163	n.s.
DASS_anxiety	−0.045	0.084	0.053	0.529	n.s.
Perceived life satisfaction	0.051	0.025	0.159	2.051	<0.05

n.s., not significant. Bold values indicate results statistically significant according to $p < 0.05$.

Specifically, WHO-5 contributed significantly to the model ($B = 0.145, p \leq 0.01$), as did life satisfaction ($B = 0.051, p \leq 0.05$). In contrast, DASS_Stress, DASS_Depression, and DASS_Anxiety were not significant predictors. The model accounted for 11.1% of the variance in the QVAr_Institutional dimension (*adjusted* $R^2 = 0.093$) (see Table 6).

In the linear regression model for the QVAr_Personal dimension, the overall model was statistically significant, explaining 52.7% of the variance in personal quality of life (*adjusted* $R^2 = 0.527, F(5, 259) = 59.88, p < 0.001$). Among the predictors, the WHO-5 Well-being Index emerged as a significant positive predictor ($B = 0.168, p = 0.001$), while DASS_Stress ($B = -0.198, p = 0.05$), DASS_Depression ($B = -0.264, p = 0.001$), and DASS_Anxiety ($B = 0.322, p < 0.001$) were significant negative predictors. In contrast, perceived life satisfaction did not significantly predict QVAr_Personal. This model demonstrated one of the strongest explanatory powers among the QVAr dimensions analyzed (see Table 7).

TABLE 7 Wave 1. Predictors of the academic experiences – personal dimension.

	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
(Constant)	3.852	0.269		14.329	≤0.001
WHO-5_well-being index	0.168	0.051	0.187	3.289	≤0.001
DASS_stress	−0.198	0.082	−0.177	−2.426	≤0.05
DASS_depression	−0.264	0.081	−0.203	−3.259	≤0.001
DASS_anxiety	−0.322	0.089	−0.260	−3.610	≤0.001
Perceived life satisfaction	0.034	0.026	0.072	1.284	n.s.

n.s., not significant. Bold values indicate results statistically significant according to $p < 0.05$.

TABLE 8 Wave 1. Predictors of the academic experiences – study/course dimension.

	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
(Constant)	2.695	0.306		8.815	<0.001
WHO-5_well-being index	0.231	0.058	0.294	3.973	<0.001
DASS_stress	0.071	0.093	0.072	0.764	n.s.
DASS_depression	−0.121	0.092	−0.107	−1.315	n.s.
DASS_anxiety	−0.130	0.101	−0.120	−1.286	n.s.
Perceived life satisfaction	0.045	0.030	0.109	1.492	n.s.

n.s., not significant. Bold values indicate results statistically significant according to $p < 0.05$.

Finally, linear regression analysis of the QVAr_Study/course dimension revealed that only the Well-being Index (WHO-5) was a significant positive predictor of students' perceived quality of life in this domain ($B = 0.231, p < 0.001$). Conversely, perceived life satisfaction, DASS_Stress, DASS_Depression, and DASS_Anxiety did not show statistically significant associations. This model explained 20.3% of the variance in the QVAr_Study/course dimension (*adjusted* $R^2 = 0.203, F(5, 259) = 14.46, p < 0.001$) (see Table 8).

Students' main difficulties and strategies

Regarding the primary reasons for academic dropout in the first year of undergraduate study, the most frequently cited responses were course dislike or wrong program choice ($n = 16$), lack of motivation/loss of interest ($n = 13$), and mental health issues ($n = 12$) (see Table 9).

Key strategies identified for enhancing student retention included: financial support ($n = 12$), psychological support and well-being ($n = 10$), improvement in student integration and welcoming ($n = 8$), and revision of teaching and assessment methods ($n = 8$) (see Table 10).

Wave 2

Descriptive statistics

The descriptive results of the dimensions under study are shown in Table 11.

Mean scores for QVAr dimensions ranged from 3.18 (Personal dimension, $SD = 0.84$) to 3.98 (Career dimension,

TABLE 9 Wave 1. Reasons for academic dropout in the first year of undergraduate studies ($N = 83$).

Reason	<i>n</i>
Disliking the course/wrong choice	16
Lack of motivation/loss of interest	13
Mental health issues (anxiety, depression, stress)	12
Financial difficulties	10
Course demands/academic difficulty	9
Lack of support (family, financial, academic)	6
Social isolation/lack of friends	6
External pressure (family, society)	4
Lack of housing	2
Change in personal/professional goals	2
Other (high tuition fees, devaluation of higher education, etc.)	3

TABLE 10 Wave 1. Main strategies to support student retention ($N = 105$).

Strategy	Frequency
Financial support (tuition, scholarships)	12
Psychological support and well-being	10
Improvement in integration and welcoming	8
Revision of teaching and assessment methods	8
Better vocational and career guidance	7
Support for balancing studies and work/family	7
Personal development and individual strategies	7
More support from professors	6
Reduction of workload and schedule flexibility	6
Better information about courses before choice	6
Improvement of infrastructures and study conditions	6
Promotion of extracurricular activities	5
Other various suggestions	17

$SD = 0.65$). The Interpersonal domain had a mean score of 3.66 ($SD = 0.73$), the QVAr_Institutional domain 3.75 ($SD = 0.64$), and QVAr_Study/course 3.47 ($SD = 0.63$). The Well-being Index (WHO-5) yielded a mean score of 3.64 ($SD = 0.88$). For psychological symptoms measured by the DASS-21, mean scores ranged from 1.80 for anxiety ($SD = 0.77$) and 1.81 for depression ($SD = 0.75$) to 2.15 for stress ($SD = 0.72$). Perceived life satisfaction showed a mean score of 7.03 ($SD = 1.60$). Weekly aerobic exercise averaged 2.50 ($SD = 1.37$), while weekend aerobic exercise averaged 2.13 ($SD = 1.17$). Weekday sleep habits averaged 2.58 ($SD = 0.53$), and weekend sleep habits 3.16 ($SD = 0.56$). Screen time was comparable between weekdays ($M = 4.89$, $SD = 1.17$) and weekends ($M = 4.89$, $SD = 1.22$). Weekday breakfast regularity averaged 5.50 ($SD = 2.80$), and weekend breakfast regularity 2.54 ($SD = 0.78$). Weekday tobacco consumption averaged 1.65 ($SD = 1.36$), and weekend tobacco consumption 1.60 ($SD = 1.23$). Weekday alcohol consumption averaged 1.67 ($SD = 1.26$), and weekend alcohol consumption 1.58 ($SD = 0.64$).

Correlations between the study's dimensions

Spearman rank correlation analysis revealed several significant associations between the examined variables. Higher levels of DASS_Stress, DAA_Depression, and DASS_Anxiety symptoms were significantly negatively correlated with perceived life satisfaction ($r = -0.58$, $p < 0.001$; $r = -0.64$, $p < 0.001$; $r = -0.52$, $p < 0.001$, respectively). Conversely, perceived life satisfaction exhibited significant positive correlations with all QVAr dimensions, indicating that more positive interpersonal, institutional, personal, career, and study/course experiences were associated with greater life satisfaction (e.g., QVAr_Interpersonal: $r = 0.49$, $p < 0.001$; QVAr_Institutional: $r = 0.45$, $p < 0.001$). Furthermore, all QVAr dimensions demonstrated positive inter-correlations. Notably, a strong positive correlation was observed between the QVAr_Institutional and QVAr_Career dimensions ($r = 0.62$, $p < 0.001$). The QVAr_Study/course dimension also showed positive correlations with other QVAr dimensions, suggesting that positive academic experiences are interrelated across various domains (e.g., QVAr_Study/course and QVAr_Career: $r = 0.54$, $p < 0.001$).

The Well-being Index (WHO-5) exhibited positive relationships with all QVAr dimensions ($r = 0.319$ to 0.580).

Psychological symptom scales from the DASS-21 exhibited negative correlations with all QVAr dimensions and perceived life satisfaction. Specifically, stress symptoms showed a significant negative correlation with QVAr_Personal ($r = -0.56$, $p < 0.001$).

Weekly aerobic activity was positively correlated with both QVAr_Interpersonal ($r = 0.21$, $p < 0.01$) and QVAr_Personal ($r = 0.18$, $p < 0.05$) dimensions. Weekend aerobic activity showed a significant positive correlation solely with QVAr_Interpersonal ($r = 0.19$, $p < 0.05$). Weekday sleep duration was positively correlated with QVAr_Personal ($r = 0.26$, $p < 0.001$) and QVAr_Study/course ($r = 0.22$, $p < 0.01$). However, no significant associations were found with QVAr_Institutional or QVAr_Interpersonal dimensions. Weekend screen time was significantly negatively correlated with QVAr_Interpersonal ($r = -0.23$, $p < 0.001$), QVAr_Personal ($r = -0.19$, $p < 0.05$), and QVAr_Institutional ($r = -0.17$, $p < 0.05$).

Weekday breakfast frequency showed a significant positive correlation with academic experience, particularly within the QVAr_Study/course dimension ($r = 0.24$, $p < 0.01$). Weekend breakfast frequency, however, showed non-significant correlations. Weekday cigarette use was significantly negatively correlated with QVAr_Personal ($r = -0.22$, $p < 0.01$) and QVAr_Study/course ($r = -0.19$, $p < 0.05$). This negative relationship with QVAr_Personal persisted into the weekend ($r = -0.21$, $p < 0.05$). Weekday alcohol use was positively correlated with QVAr_Interpersonal ($r = 0.20$, $p < 0.05$) and QVAr_Personal ($r = 0.18$, $p < 0.05$), but negatively correlated with QVAr_Study/course ($r = -0.16$, $p < 0.05$). Weekend alcohol use was positively correlated with QVAr_Interpersonal ($r = 0.22$, $p < 0.01$) and perceived life satisfaction ($r = 0.19$, $p < 0.05$), while negatively correlated with QVAr_Study/course ($r = -0.20$, $p < 0.05$).

Gender Differences in the study's dimensions

Mann-Whitney U tests indicated no statistically significant gender differences for most of the examined factors. However, a

TABLE 11 Wave 2. Descriptive data of the dimensions under study.

	Wave 2			Min	Max
	N	Mean	SD		
QVAr_interpersonal	115	3.66	0.73	1	5
QVAr_career	115	3.98	0.65	1	5
QVAr_institutional	115	3.75	0.64	1	5
QVAr_personal	115	3.18	0.84	1	5
QVAr_study_course	115	3.47	0.63	1	5
WHO-5_psychological well-being	115	3.64	0.83	1	6
DASS_stress	115	2.15	0.72	1	4
DASS_depression	115	1.81	0.75	1	4
DASS_anxiety	115	1.80	0.77	1	4
Perceived life satisfaction	115	7.03	1.6	0	10
Aerobic activity_week	115	2.5	1.37	1	5
Aerobic activity_weekend	115	2.13	1.17	1	5
Sleep pattern_week	115	2.58	0.53	1	3
Sleep pattern_weekend	115	3.16	0.56	1	4
Screen time_week	114	4.89	1.17	1	7
Screen time_weekend	114	4.89	1.223	1	7
Breakfast regularity_week	114	5.5	2.80	1	8
Breakfast regularity_weekend	114	2.54	0.78	1	3
Tobacco use_week	114	1.65	1.36	1	7
Tobacco use_weekend	114	1.6	1.23	1	7
Alcohol consumption_week	114	1.67	1.26	1	5
Alcohol consumption_weekend	113	1.58	0.64	1	3

significant gender difference was observed for the QVAr_Personal dimension ($U = 436.00$, $p < 0.05$) and Well-being Index (WHO-5) ($U = 361.00$, $p < 0.01$), with males exhibiting significantly higher scores than females. No significant gender differences were found in the QVAr_Interpersonal, QVAr_Career, QVAr_Institutional, and QVAr_Study/course dimensions. Furthermore, scores on the DASS_Stress, DASS_Depression, DASS_Anxiety, and perceived life satisfaction also did not differ significantly between gender groups (see [Tables 12, 13](#)).

QVAr dimensions: multiple linear regressions

For the QVAr_Interpersonal dimension, the multiple linear regression model was statistically significant overall ($R^2 = 0.154$, adjusted $R^2 = 0.116$, $F(5, 109) = 3.98$, $p < 0.01$), accounting for 15.4% of the variance in QVAr_Interpersonal. In this model, the Well-being Index (WHO-5) was the only significant positive predictor ($B = 0.218$, $p < 0.05$). DASS_Stress, DASS_Depression, DASS_Anxiety, and perceived life satisfaction did not emerge as significant predictors ([Table 14](#)).

For the QVAr_Career dimension, the multiple linear regression model was statistically significant overall ($R^2 = 0.192$, adjusted $R^2 = 0.154$, $F(5, 109) = 5.17$, $p < 0.001$), accounting for 19.2% of the variance in QVAr_Career. In this model, only perceived life satisfaction emerged as a significant positive predictor ($B = 0.087$, $p < 0.05$). The Well-being Index (WHO-5), DASS_Stress,

DASS_Depression, and DASS_Anxiety did not show statistically significant associations ([Table 15](#)).

The multiple linear regression model for the QVAr_Institutional dimension was statistically significant overall ($R^2 = 0.192$, adjusted $R^2 = 0.155$, $F(5, 109) = 5.17$, $p < 0.001$), explaining 19.2% of the variance in QVAr_Institutional. Among the predictors, well-being (WHO-5) was the only significant positive predictor ($B = 0.298$, $p < 0.001$). DASS_Stress, DASS_Depression, DASS_Anxiety, and perceived life satisfaction were not statistically significant predictors in this model (see [Table 16](#)).

The multiple linear regression model for the QVAr_Personal dimension was statistically significant ($R^2 = 0.703$, adjusted $R^2 = 0.690$, $F(5, 109) = 51.71$, $p < 0.001$), explaining 70.3% of the variance in QVAr_Personal. Significant predictors included well-being (WHO-5) ($B = 0.189$, $p < 0.01$), DASS_Stress ($B = -0.489$, $p < 0.001$), and DASS_Depression ($B = -0.244$, $p < 0.05$). Perceived life satisfaction and DASS_Anxiety were not statistically significant predictors in this model (see [Table 17](#)).

Linear regression analysis for the QVAr_Study/course dimension revealed that the model was statistically significant overall ($R^2 = 0.215$, adjusted $R^2 = 0.179$, $F(5, 109) = 5.98$, $p < 0.001$), explaining approximately 21.5% of the variance in QVAr_Study/course. Among the predictors, only well-being (WHO-5) showed a statistically significant positive association with this dimension ($B = 0.214$, $p < 0.01$). The remaining variables,

TABLE 12 Wave 2. Mann-Whitney U test results: mean ranks and sum of ranks for academic experiences, psychological well-being, and mental health by gender.

	Gender	N	Mean rank	Sum of ranks
QVAr_interpersonal	Male	13	60.50	786.50
	Female	102	57.68	5883.50
QVAr_career	Male	13	61.42	798.50
	Female	102	57.56	5871.50
QVAr_institutional	Male	13	56.38	733.00
	Female	102	58.21	5937.00
QVAr_personal	Male	13	75.46	981.00
	Female	102	55.77	5689.00
QVAr_study/course	Male	13	74.50	968.50
	Female	102	55.90	5701.50
WHO-5_well-being index	Male	13	81.23	1056.00
	Female	102	55.04	5614.00
DASS_stress	Male	13	55.31	719.00
	Female	102	58.34	5951.00
DASS_depression	Male	13	63.27	822.50
	Female	102	57.33	5847.50
DASS_anxiety	Male	13	61.19	795.50
	Female	102	57.59	5874.50
Perceived life satisfaction	Male	13	59.88	778.50
	Female	102	57.76	5891.50

TABLE 13 Wave 2. Mann-Whitney U test for differences in academic experiences, well-being, and mental health by gender.

Variable	U	Z	W	p
QVAr_interpersonal	630.50	−0.287	5883.50	n.s.
QVAr_career	618.50	−0.394	5871.50	n.s.
QVAr_institutional	642.00	−0.186	733.00	n.s.
QVAr_personal	436.00	−2.006	5689.00	<0.05
QVAr_study/course	448.50	−1.896	5701.50	n.s.
WHO-5_well-being index	361.00	−2.677	5614.00	<0.01
DASS_stress	638.50	−0.221	5891.50	n.s.
DASS_depression	628.00	−0.310	719.00	n.s.
DASS_anxiety	594.50	−0.608	5847.50	n.s.
Perceived life satisfaction	621.50	−0.368	5874.50	n.s.

n.s., not significant. Bold values indicate results statistically significant according to $p < 0.05$.

DASS_Stress, DASS_Depression, DASS_Anxiety, and perceived life satisfaction, were not significant predictors (see [Table 18](#)).

Students' main difficulties and strategies

Inquiring about the primary reasons for first-year undergraduate academic dropout, the most frequently cited responses included: incorrect course/degree selection or lack of course/degree interest ($n = 28$), difficulties adjusting to higher

education ($n = 12$), and financial constraints or tuition expenses ($n = 11$) (see [Table 19](#)).

In terms of retention strategies, the primary approaches identified were psychological support services and well-being initiatives ($n = 15$), financial assistance ($n = 12$), and enhanced integration support coupled with peer mentoring programs ($n = 12$) (see [Table 20](#)).

Discussion and conclusion

This study assessed the impact of the PROTEUS project on first-year university students by comparing two distinct cohorts: Wave 1 (pre-intervention) and Wave 2 (post-intervention). This two-wave design enabled us to examine whether the introduction of PROTEUS initiatives (e.g., the PROTEUS Office, Welcome Manual, workshops, tutoring/mentoring, and well-being resources) contributed to changes in students' academic experiences, well-being, and health behaviors ([Aina et al., 2022](#); [Alyahyan and Düşteğör, 2020](#); [Kehm et al., 2019](#)). Since the two groups shared similar backgrounds, we felt confident drawing meaningful comparisons.

The Wave 1 findings indicated significant correlations between students' academic experiences (QVAr) and their psychological well-being. Consistent with existing literature highlighting the psychological vulnerability of university students ([Backhaus et al., 2020](#); [Baik et al., 2019](#); [Lipson and Eisenberg, 2018](#)), our results underscore the critical role of psychological well-being within the educational context. Specifically, we observed negative correlations between all QVAr dimensions and life satisfaction with symptoms of stress, anxiety, and depression. Conversely, all QVAr dimensions were significantly predicted by life satisfaction, aligning with prior research suggesting that satisfied students tend to feel more positive about their studies ([Duffy et al., 2012](#)). The Well-being Index (WHO-5) also exhibited positive relationships with all QVAr dimensions.

Further analysis in Wave 1, exploring predictors of specific QVAr dimensions, revealed distinct patterns supported by theoretical and empirical evidence. DASS_Depression and WHO-5 significantly predicted QVAr_Interpersonal (13.3% of variance), corroborating the importance of mental health in social relationships ([Uchino, 2009](#)) and academic integration ([Tinto, 1975, 2021](#)), where psychological well-being facilitates interaction with peers and faculty. For QVAr_Career, significant predictors were DASS_Depression, DASS_Anxiety, and life satisfaction (14.7% of variance). This variety reflects the link between career confidence and overall well-being. Career development theories ([Brown and Lent, 2019](#)) connect optimism and self-efficacy, influenced by mental health, to career orientation. The Wellbeing Index (WHO-5) and perceived life satisfaction emerged as predictors of QVAr_Institutional (11.1% of variance), suggesting that general life satisfaction influences the perception of the university environment. This aligns with studies on student satisfaction and institutional fit ([Astin, 1993](#)), where overall well-being shapes the perception of the institution ([Strayhorn, 2019](#)). QVAr_Personal presented the most robust model (52.7% of variance), with the Wellbeing Index (WHO-5), DASS_Stress, DASS_Depression, DASS_Anxiety, and life satisfaction as predictors. This is justified by the nature of QVAr_Personal, which

TABLE 14 Wave 2. Predictors of the academic experiences – interpersonal dimension.

	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
(Constant)	2.738	0.618		4.427	<0.001
WHO-5__well-being index	0.218	0.095	0.248	2.302	<0.05
DASS_stress	0.192	0.213	0.185	0.902	n.s.
DASS_depression	−0.224	0.164	−0.225	−1.366	n.s.
DASS_anxiety	−0.074	0.211	0.076	0.350	n.s.
Perceived life satisfaction	0.034	0.051	0.073	0.668	n.s.

n.s., not significant. Bold values indicate results statistically significant according to $p < 0.05$.

TABLE 15 Wave 2. Predictors of the academic experiences – career dimension.

	<i>B</i>	<i>SE</i>	β	<i>T</i>	<i>p</i>
(Constant)	3.058	0.527		5.807	<0.001
WHO-5__well-being index	0.118	0.081	0.154	1.466	n.s.
DASS_stress	−0.004	0.182	−0.004	−0.021	n.s.
DASS_depression	−0.232	0.140	−0.267	−1.657	n.s.
DASS_anxiety	0.146	0.180	0.171	0.812	n.s.
Perceived life satisfaction	0.087	0.043	0.214	2.013	<0.05

n.s., not significant. Bold values indicate results statistically significant according to $p < 0.05$.

TABLE 16 Wave 2. Predictors of the academic experiences – institutional dimension.

	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
(Constant)	1.845	0.519		3.552	<0.001
WHO-5__well-being index	0.298	0.080	0.394	3.743	<0.001
DASS_stress	0.271	0.179	0.304	1.510	n.s.
DASS_depression	−0.006	0.138	−0.007	−0.046	n.s.
DASS_anxiety	−0.123	0.177	−0.146	−0.693	n.s.
Perceived life satisfaction	0.065	0.043	0.162	1.520	n.s.

n.s., not significant. Bold values indicate results statistically significant according to $p < 0.05$.

TABLE 17 Wave 2. Predictors of the academic experiences – personal dimension.

	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>P</i>
(Constant)	3.982	0.417		9.555	<0.001
WHO-5__well-being index	0.189	0.064	0.188	2.956	<0.01
DASS_stress	−0.489	0.144	−0.414	−3.401	<0.001
DASS_depression	−0.244	0.111	−0.214	−2.200	<0.05
DASS_anxiety	−0.139	0.142	−0.125	−0.976	n.s.
Perceived life satisfaction	0.029	0.034	0.054	0.844	n.s.

n.s., not significant. Bold values indicate results statistically significant according to $p < 0.05$.

assesses self-confidence and coping, core elements of well-being and resilience (Bandura, 1997; Luthar et al., 2000), strongly influenced by mental health. The Wellbeing Index (WHO-5) was the only predictor of QVAr_Study/Course (20.3% of variance), indicating that a general positive outlook contributes to some specific academic satisfaction. However, the lower variance explained suggests that other course-specific factors (teaching

quality, interest, workload management) are more determinant (Fredricks et al., 2004; Ryan and Deci, 2000).

Results from Wave 2 confirmed these patterns. Replication across waves validates these results (Schmidt, 2009), highlighting the consistent link between well-being, academic experiences, especially in QVAr_Personal. The consistently lower predictability of QVAr_Study/Course suggests that more course-specific factors

TABLE 18 Wave 2. Predictors of the academic experiences – study/course dimension.

	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
(Constant)	2.984	0.494		6.042	<0.001
WHO-5_well-being index	0.214	0.076	0.293	2.831	<0.01
DASS_stress	−0.097	0.170	−0.112	−0.566	n.s.
DASS_depression	−0.156	0.131	−0.188	−1.186	n.s.
DASS_anxiety	0.055	0.169	0.068	0.325	n.s.
Perceived life satisfaction	0.006	0.041	0.015	0.145	n.s.

n.s., not significant. Bold values indicate results statistically significant according to $p < 0.05$.

are preponderant in satisfaction within this dimension. Students in their second year reported slightly higher scores in QVar_Personal, while other QVar dimensions remained relatively stable. It's possible that the PROTEUS interventions helped maintain or even improve students' experiences during a challenging transition, though we can't say for sure that these changes were caused by the program alone (Rienties et al., 2012).

While several correlations between academic experiences, well-being, and lifestyle factors were statistically significant, many were quite modest (e.g., r -values around 0.10–0.13). Similarly, regression models explained a modest proportion of variance in most QVar dimensions, with the notable exception of QVar_Personal, which showed a stronger model fit. These findings suggest that, although well-being is important, student experiences are influenced by a complex array of factors, many of which may not have been captured in this study (Fredricks et al., 2004; Ryan and Deci, 2000). This highlights the need for ongoing, multifaceted support and further research to identify additional determinants of student success and dropout. Interestingly, despite previous research suggesting higher stress and anxiety in female students (e.g., Bayram and Bilgel, 2008; Eisenberg et al., 2007; Mahmoud et al., 2012; Simões de Almeida et al., 2025), this study found that male students reported higher values only for the QVar_Personal factor in Wave 1 and QVar_Interpersonal, QVar_Career, QVar_Personal and QVar_Study_Course in Wave 2. This gender difference, could show that psychological adaptation in higher education is complex and may require tailored interventions.

For lifestyle factors, the trends seen in Wave 1 generally persisted in Wave 2. Consistent with findings on the detrimental effects of excessive screen time on well-being (e.g., Twenge et al., 2018), our study revealed a negative association between weekend screen time and both QVar dimensions and life satisfaction. Research by Primack et al. (2017) further suggests that higher screen time can contribute to social isolation, potentially impacting interpersonal aspects of academic experiences. Considering the already established benefits of regular physical activity for mental health (Sharma et al., 2006), our findings indicate a positive correlation between weekly aerobic exercise and QVar_Interpersonal and QVar_Personal dimensions. The positive impact of exercise on mood and self-perception (Fox, 2000), along with the social benefits of group physical activity (Mutrie and Faulkner, 2004), may contribute to these enhanced academic experiences.

Regarding factors related to academic dropout, the most common reasons were choosing the wrong course, struggling to

TABLE 19 Wave 2. Reasons for academic dropout in the first year of undergraduate studies ($N = 115$).

Reason	<i>n</i>
Wrong course choice/lack of interest in the course	28
Difficulty adapting to higher education	12
Financial problems/tuition costs	11
Mental health issues (anxiety, depression, stress)	10
Lack of motivation/discouragement	9
Difficulty managing time/academic demands	7
Lack of social support (family, friends, professors)	6
Need to work	5
Isolation/difficulty making friends	4
Unrealistic expectations about the course	4
Personal problems/physical health	3
Other factors (excessive workload, social media, indecision, etc.)	16

TABLE 20 Wave 2. Main strategies to support student retention ($N = 107$).

Strategies	<i>n</i>
Psychological support and well-being	15
Financial support (tuition, scholarships, materials)	12
Integration, mentoring, and peer support	12
Time management and adaptation	10
Curricular flexibility and course change	10
Improvement of university conditions	9
Extracurricular activities and inclusion	9
Personal development and career guidance	9
Individual strategies (organization, motivation)	8

adjust, and financial difficulties. The most frequently mentioned student retention techniques were integration through mentoring, financial aid help, and psychological support. These findings are further contextualized by Lorenzo-Quiles et al. (2023) who identified student adaptation, personality, socioeconomic level, teacher-student relationship, and educational quality as major contributors to university dropout. Notably, across both waves and in the analysis of dropout reasons, the QVar_Personal dimension consistently emerged as a key area, exhibiting the highest percentage of explained variance and predictive factors,

suggesting its central role in students' academic experiences and well-being.

To facilitate students' transition and adaptation to higher education, a multifaceted approach was adopted, encompassing the PROTEUS Office, Welcome Manual, workshops, tutoring/mentoring, nudges and welcome letters, a new curricular unit, and videos. Consistent with [Rienties et al.'s \(2012\)](#) findings on the positive correlation between smooth transitions from secondary education and university success, including degree completion, these initiatives, despite facing implementation barriers like teacher/student participation, bureaucracy, and a short project lifespan, demonstrated success and highlighted the critical need for sustained, long-term investment in such solutions.

To conclude, students' psychological well-being and life satisfaction are crucial in shaping their academic experiences, and targeted institutional actions are noticed and valued as important retention strategies. And while many factors affecting students' success are beyond institutional control, targeted interventions like PROTEUS can contribute to a more supportive environment, making it easier for students to feel connected and thrive academically. The comparison between the two waves highlights the stability of key indicators over time, with some encouraging trends after the introduction of new support mechanisms. These results indicate that supporting students requires continuous, multifaceted strategies that address both personal and systemic challenges.

Future research will benefit from longitudinal designs, incorporating additional variables (such as social support, academic engagement, teaching practices), and further explore the mechanisms by which institutional interventions influence student outcomes. While this study has its limitations, we believe it offers useful insights that can help shape more effective policies and practices to promote student well-being and success in higher education.

Strengths and limitations

This study has several strengths that should be recognized. Data gathering at two distinct points in time (Waves 1 and 2) enables for the capture of fluctuations throughout time, offering a fuller knowledge of the phenomenon under inquiry, even though this is not a longitudinal study. Although the sample size of 265 participants was not probability-based, it was chosen to include people from various fields of study and educational levels, assuring research variety. The incorporation of widely accepted and validated measures from the scientific literature, such as the WHO-5 and DASS-21, improves the reliability and validity of the obtained data. Moreover, although data were collected at two time points, the smaller sample size in Wave 1, about half that of Wave 2, limits the analysis of fluctuations between waves and the understanding of temporal dynamics in students' experiences and well-being. Additionally, the lack of a pre- and post-intervention design restricts the ability to infer causality or assess changes related to specific events.

Furthermore, examining different dimensions of academic experiences, well-being, health, and lifestyle fosters a thorough

understanding of how the university atmosphere affects students' lives.

However, the study contains some limitations that should be considered. The lack of a random sample technique reduces the results' generalizability to the overall examined population.

Furthermore, data gathering using self-administered surveys may include biases, such as social desirability and subjectivity in participants' responses. The study did not account for variables such as mental health history, severe life events, or social support, which could have influenced the findings.

Despite these limitations, this study provides useful information about students' academic experiences and well-being. The findings can aid in the development of therapies and policies aimed at improving mental health and academic achievement.

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 humans were approved by the Ethics Committee of the University on December 15, 2023 (Opinion CETCH2023-63). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

JP: Conceptualization, Funding acquisition, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing. SR: Conceptualization, Funding acquisition, Supervision, Writing – original draft, Writing – review & editing, Project administration. CB: Formal analysis, Methodology, Writing – original draft, Writing – review & editing.

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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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