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RECEIVED 10 July 2025

ACCEPTED 26 August 2025

PUBLISHED 12 September 2025

CITATION

Ueno M, Asakura T, Monobe H, Masuko Y,
Ly K, Thay S and Say S (2025) Wellbeing in
pre-service teacher education: gender and
economic disparities among Cambodian
student teachers. *Front. Educ.* 10:1663436.
doi: 10.3389/feduc.2025.1663436

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Wellbeing in pre-service teacher education: gender and economic disparities among Cambodian student teachers

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Cambodia, with a low Human Capital Index, faces various health challenges influenced by economic and sociocultural factors and advances health promotion in schools by empowering student teachers. This study investigated comprehensive health of students at Teacher Education Colleges (TECs) in Cambodia by assessing social determinants of health such as gender, financial status, and their interaction effect. A cross-sectional research design was used involving 587 fourth-year students from two TECs. Data were collected via an anonymized self-administered questionnaire covering wellbeing, psychological symptoms, social capital, and health and safety behaviors including diet and exercise habits, smoking, and alcohol consumption. Compared to male students, female students reported significantly higher psychological symptoms such as loneliness ($F = 12.65$, $p < 0.001$, $\eta^2 = 0.021$). Also, female students had fewer social relationships than male students. Students with financial difficulties showed significantly lower wellbeing such as life satisfaction ($F = 33.68$, $p < 0.001$, $\eta^2 = 0.055$) and had more psychological symptoms than those without difficulties. Their dietary habits were poor, and they lacked social support. No significant differences were found in the interaction terms between gender and financial status. Overall, the numbers of TEC students with smoking and drinking habits were relatively low, and social trust levels were notably low across all groups. This study emphasizes the need to support female students and students facing financial challenges by strengthening mental health care and social relationships within university, along with promoting social support systems for financially disadvantaged students.

KEYWORDS

student teacher, wellbeing, health and safety behaviors, social trust, social support, Cambodia, South East Asia

1 Introduction

Developing countries face various health challenges due to rapid social changes, socioeconomic disparities, and inadequate infrastructure (Al-Worafi, 2023). These challenges are often exacerbated when economic growth is prioritized over addressing underlying health disparities. Although several ASEAN countries have recently moved out of the lower-to-middle income category, significant disparities in human capital index (HCI) remain within the region. According to the World Bank (2020), the HCI scores for Cambodia, Myanmar, and Lao PDR are still below 0.5 on a 0–1 scale, highlighting the

need for investments in health, which directly benefits each population's wellbeing. Also, the youth population in ASEAN countries is increasing (ASEAN, 2017), making it critical to address health challenges among the next generation. To frame these health issues, this study employs the Social Determinants of Health (SDH) theory, which highlights how health outcomes are shaped by a wide range of social, economic, and environmental factors, including education, income, gender norms, and access to resources (WHO, 2008). Applying this framework is particularly valuable for understanding the wellbeing of young people in low-HCI countries.

As a measure to improve the HCI, health promotion in schools would play a significant role. In fact, several international organizations consider schools as key settings for health promotion: for example, Health Promoting Schools by WHO, Whole School Approach and Focusing Resources on Effective School Health Resources by UNESCO, and Child-Friendly Schools by UNICEF. These concepts emphasize the importance of both student and teacher health. Health promotion focuses on enabling individuals to improve their health by building supportive policies, creating healthy environments, and strengthening personal skills and community actions (Nutbeam, 1998). Teachers, in particular, influence not only their own health but also the health behaviors of their students. Therefore, teachers are required to be role models of health promoters in schools for their children.

Cambodia, with its low Human Capital Index, is rebuilding its health and education systems after the civil war. Recent reforms include establishing Teacher Education Colleges (TECs) in 2018, introducing weekly health education in 2025, and creating health rooms in all schools (Inter-Ministerial Committee on School Health, 2022; Royal Government of Cambodia, 2023). Since their establishment, approximately 975 students have graduated from TECs and are now teaching in primary and lower secondary schools, with increasing female enrollment contributing to women's participation in higher education (Japan International Cooperation Agency, 2023).

Students in TECs in Cambodia are a critical group for study. As future educators, they are required to model healthy behaviors and promote health in schools. Teachers' health behaviors and attitudes can have a significant impact on promoting healthy lifestyles among their students (Aryal, 2022; Wilf-Miron et al., 2022). Therefore, TEC students face unique challenges as both individual university students and future educators, making it important to support their health to ensure that they can effectively contribute to health promotion in schools in Cambodia. However, there has been little research on their health in Cambodia.

To explore the health situation among future Cambodian educators, this research attempted to reveal the health status and health-related variables leading to public health issues such as non-communicable diseases (NCDs) and mental health problems. NCDs are becoming a major concern in developing countries (Boutayeb and Boutayeb, 2005; Terzic and Waldman, 2011). According to WHO (2019), NCDs are responsible for 64% of all deaths in Cambodia. Health behavioral risk factors such as the lack of appropriate diet habits and physical activity were shown to be present among university students in ASEAN countries including

Cambodia (Yi et al., 2017; Peltzer and Pengpid, 2018; Sok et al., 2020). To prevent increasing the risks of NCDs, one strategy is environmental approaches promoting health and supporting healthy behaviors (CDC, 2015). Therefore, educational institutions have an important role in encouraging healthy behaviors in daily life among students.

Additionally, as mental health is another significant issue, this study clarified the situation regarding mental health and social capital among TEC students. University students worldwide experience higher rates of depression than the general populations (Ibrahim et al., 2013). In low-to-middle-income countries including ASEAN countries, one-quarter of university students reported depressive symptoms (Akhtar et al., 2020; Dessauvagie et al., 2022), and Cambodia is no exception (Pan, 2017; Ngin et al., 2018). Addressing mental health among TEC students is crucial because untreated conditions can affect their academic performance and future careers (de Oliveira et al., 2022; Johnson et al., 2018; Kraus et al., 2019). With limited mental health care services available in Cambodia (Jegannathan et al., 2015), and the importance of family and academic support as factors for teachers' motivation (Sambonin and Liu, 2017), it is necessary to build relationships and get support from others to maintain mental wellbeing.

Consistent with the SDH perspective, these health-related outcomes are influenced by social factors (Aceijas et al., 2017). Therefore, this study examined the wellbeing of TEC students from the perspective of the SDH, particularly those relevant to the Cambodian context, such as gender norms and financial disparities. In Cambodia, gender norms are shaped by a traditional moral code known as the "Chbab Srey," which prescribes ideal behaviors for women, emphasizing obedience, modesty, and the maintenance of domestic harmony (Anderson and Grace, 2018). Historically taught in school and passed down through families, this code has played a central role in reinforcing gender inequality by limiting women's social, educational, and economic opportunities (Anderson and Grace, 2018; UN Cambodia, 2022). Although it is no longer taught in school settings, these norms may continue to exert a significant influence on the wellbeing especially of female teacher students. Furthermore, in countries with greater income inequality, poor wellbeing including depressive symptoms has often been observed (Steptoe et al., 2007; Kaplan et al., 2008). Rapid economic disparities brought by urban development in Cambodia have become a growing concern, with mental health issues prevalent among the poor (Jarl et al., 2015). At teacher training universities, tuition is free, and students are registered with the Secretariat of Public Service to receive a monthly scholarship allowance. However, financial disparities based on family economic situations might remain a concern among students.

Based on the above points, this study hypothesized that wellbeing among Cambodian student teachers differs by gender and financial status, and that interaction effects between these factors may also exist. The aim of this study was to examine gender and financial disparities in health status and health-related variables, as well as their interaction effects, among TEC students in Cambodia.

2 Materials and methods

2.1 Study design and participants

This study was conducted using a cross-sectional study design from May to June in 2022, and 2023. The sample included 600 fourth-year students from Phnom Penh Teacher Education College and Battambang Teacher Education College. All students voluntarily participated in the study and answered the self-administered questionnaire in the lecture hall in both colleges.

2.2 Data collection

A structured questionnaire was first developed in English. Then, a bilingual Cambodian research team translated it into Khmer and checked the accuracy by back translation into English. The questionnaire comprised three sections. The first section collected socio-demographic status data, including gender, age, marital status, self-rated financial status, and academic performance. Self-rated financial status was evaluated on a 5-point scale; 1 = quite poor, 2 = not very well-off, 3 = neither well-off nor poor (moderate), 4 = well-off, 5 = very well-off, following previous socioeconomic and health research (Singh-Manoux et al., 2005).

The second section assessed health status, including wellbeing and psychological symptoms. These variables were developed from measures previously used among university students (Pengpid et al., 2015). Self-rated health and mental health were assessed on a 5-point scale from very poor to excellent. Life satisfaction was assessed on a 7-point scale from extremely dissatisfied to extremely satisfied, with higher points indicating better wellbeing. Psychological symptoms included the frequency of loneliness, worry, and thinking too much, adapted from the Global School-based Student Health Survey (World Health Organization, 2013) and prior studies in Cambodian populations (Hinton et al., 2015; Meyer et al., 2014). These were assessed on a 5-point scale, with higher points indicating more frequent symptoms. “Thinking too much” is a culturally grounded idiom of distress. It refers to ruminative, intrusive, and anxious thoughts, and reflect aspects of experience, distress, and social positioning not captured by psychiatric diagnoses (Kaiser et al., 2015). In previous research, this variable was used to examine its relationship with PTSD among Cambodian refugees and mental health concerns among Cambodian labor migrants (Hinton et al., 2015; Meyer et al., 2014).

The third section covered health-related variables, including social trust, social support, and health and safety behavior (e.g., dietary habits, exercise habits, and substance use). Social trust and support variables were informed by previous studies (Murakami, 2013; Tokuda et al., 2010; Werner-Seidler et al., 2017). Social trust was assessed using a 5-point scale in response to “Do you agree that most people can be trusted?” (1 = strongly disagree to 5 = strongly agree), with higher points indicating that the person has higher social trust. The number of close people was assessed on a 4-point scale (1 = none to 4 = 5 or more). The frequency of feeling a warm, trusted relationship in the past 30 days was assessed on a 6-point scale (1 = never to 6 = every day). For both scales, higher points

indicated that having a greater number of close people and a feeling of having a warm and trusted relationship occurred more often.

Health and safety behaviors included dietary habits, substance use, and exercise habits. Items for dietary habits were adapted from prior studies (Ngin et al., 2018; Sok et al., 2020) and included six aspects: consumption of fast food, fruits, vegetables, soft drinks, frequency of having breakfast, and skipping meals. Consumption of fast food was assessed on a 9-point scale, and consumption of fruits, vegetables, soft drinks was assessed on a 7-point scale. The higher number of points indicated higher consumption of those items. Having breakfast in the past 30 days was assessed on a 6-point scale (1 = no breakfast, 2 = less than once a week, 3 = once a week, 4 = 2 to 4 days a week, 5 = 5 to 6 days a week, and 6 = everyday). Skipping a meal in the past 30 days was also assessed on a 6-point scale. Higher points indicated having a better breakfast habit, while skipping a meal more often. Substance use items were adapted from prior studies (Banta et al., 2012; San José et al., 2000) and covered drinking alcohol and smoking habits. Alcohol consumption habits in the past 30 days were assessed on a 5-point scale (1 = non-drinker, 2 = never, 3 = 1 to 2 days per week, 4 = 3 to 5 days per week, and 5 = 6 to 7 days per week). Smoking status was assessed by yes or no, along with smoking habits in the past 30 days using a 7-point scale (1 = never to 7 = everyday). Exercise habits were assessed using items from the Global School-based Student Health Survey (World Health Organization, 2013), including physical activity and walking or riding a bicycle in the past 7 days, assessed on an 8-point scale, with higher points indicating that the student was more physically active.

2.3 Data analysis

First, we calculated the descriptive statistics of the participants' health and health-related variables. Then, we conducted a multivariate analysis of variance (MANOVA) to explore the differences in each item related to health and health-related variables by gender, financial status, and its interaction effect as the independent variables. Financial status was divided into two groups: 1 = quite poor and not very well-off and 2 = moderate and above. The reason for conducting MANOVA was to avoid the possibility of causing a Type 1 error that could arise from conducting multiple *t*-tests, which would reduce the validity of the results.

We analyzed the MANOVA in each category of the dependent variables, including wellbeing (health rating, mental health rating, life satisfaction), psychological symptoms (loneliness, worrying, thinking too much), social trust and support (social trust, the number of close people, warm and trusting relationship), dietary habits (the frequency of eating fast food, fruits, vegetables, soft drinks, having breakfast, and skipping meals), and exercise habits (physical activity days, walking or riding days). As part of the “Safety behaviors” category, we initially planned to analyze substance use (i.e., alcohol consumption and smoking habits) using MANOVA. However, due to the low number of students who reported drinking or smoking, these variables were excluded from the analysis. Since the entire category was excluded, this omission does not affect the overall analysis.

When the result of MANOVA was significant, *post hoc* univariate analyses of variance (ANOVA) were run to identify the significant variables. To analyze the overall efficacy of the test, effect sizes (η^2) were calculated. All statistical analyses were performed using SPSS ver. 27. A *p*-value of <0.05 was considered to indicate statistical significance.

2.4 Ethical considerations

Participation in this study was voluntary. The research group first explained the purpose of the research, confidentiality, and privacy considerations, and that there was no disadvantage for refusing participation in the study. We also explained that the students could refuse or discontinue their participation at any time and for any reason. Thereafter, we obtained written informed consent from each participating student. This study was approved by the Human Sciences Research Ethics Committee of Tokyo Gakugei University (approval number: 555).

3 Results

3.1 Characteristics of participants

Table 1 shows the sociodemographic characteristics of the participants. Data were obtained from 587 students in total (recovery rate: 97.8%), among whom 186 students were male (31.7%) and 401 students were female (68.3%). The average age of the students was 22.5 ± 1.36 years. Most of the students were single (93.7%). Self-rated financial status showed that 41 students (7.0%) evaluated their financial status as quite poor, followed by 168 students (28.6%) students as not very well-off, 352 students (60.0%) as neither well off nor poor (moderate), and 25 students (4.3%) as well off. No students answered that their financial status was very well off. Self-rated academic performance showed that 562 students (95.8%) evaluated their academic performance as fair or good.

3.2 Overall characteristics of health and health-related variables

Wellbeing consists of three variables including self-rated health, self-rated mental health, and life satisfaction. Among the students, 44% evaluated their health as excellent or good and 45.5% evaluated their mental health also as excellent or good. Among 80.9% of the students who rated their life satisfaction, 10.4% were slightly satisfied, 57.4% were satisfied, and 13.1% were extremely satisfied.

Among the health-related variables, bias was observed in the responses regarding alcohol consumption and smoking habits. Among the students, 58.9% were non-drinkers and 31.7% had not drunk alcohol for the last 30 days. Only 1.2% of the students had an alcohol consumption habit of more than 3 days a week. Almost all students (99.0%) were non-smokers, and only 3 male students (0.6%) had smoked within the last 30 days. Therefore, we excluded the variables of both alcohol consumption and smoking habit from MANOVA.

Social trust among TEC students showed that 20.8% of the students strongly disagreed and 57.2% of the students disagreed with the statement that most people can be trusted. In contrast, 7.8% of the students agreed or strongly agreed with the statement.

3.3 Comparison by gender, financial status, and interaction effects

Table 2 shows the mean scores and standard deviations for measures of health and health-related variables, and Table 3 shows the correlation coefficients for relations between variables for each of the five measures of health and health-related variables. We performed MANOVA for each of the five categories including wellbeing, psychological symptoms, social trust and support, dietary habits, and exercise habits. Therefore, the covariance matrix represents the correlation between the variables for each of the five categories.

Variables that revealed a statistically significant effect in MANOVA by gender were psychological symptoms ($F = 5.23$, $p = 0.001$, $\eta^2 = 0.026$), social trust and support ($F = 4.70$, $p = 0.003$, $\eta^2 = 0.024$), dietary habits ($F = 6.47$, $p < 0.001$, $\eta^2 = 0.063$), and exercise habits ($F = 4.49$, $p = 0.012$, $\eta^2 = 0.015$). The results of ANOVA for psychological symptoms showed that loneliness, worrying, and thinking too much were significantly different between genders and indicated that the female students had more psychological symptoms than male students. The results of ANOVA for social trust and support showed that the male students had a significantly greater number of close people than the female students. The results of ANOVA for diet habits showed that the frequencies of eating fruits and skipping meals were significantly different between the genders and that while female students ate fruits more often than male students, they also skipped meals more often than male students. The results of ANOVA for exercise habits showed that the male students had more exercise days than the female students. Table 4 shows the multivariate and univariate analyses of variance for these health and health-related variables.

The variables that revealed a statistically significant effect in MANOVA for financial status were wellbeing ($F = 12.74$, $p < 0.001$, $\eta^2 = 0.062$), psychological symptoms ($F = 5.09$, $p = 0.002$, $\eta^2 = 0.026$), social trust and support ($F = 4.59$, $p = 0.003$, $\eta^2 = 0.023$), and dietary habits ($F = 3.36$, $p = 0.003$, $\eta^2 = 0.034$). The results of ANOVA for wellbeing showed that self-rated health, self-rated mental health, and life satisfaction were significantly different in regard to financial status, which indicates that the students with low financial status had more psychological symptoms than students with middle-to-high financial status. The results of ANOVA for psychological symptoms showed that loneliness, worrying, and thinking too much were significantly different in terms of financial status, which indicates that the students with low financial status had more psychological symptoms than students with middle-to-high financial status. The results of ANOVA for social trust and support showed that students with middle-to-high financial status had a significantly greater number of close people and felt that they had warm and trusted relationships more often than students with low financial status. Finally, the results of ANOVA for dietary habits

TABLE 1 Sociodemographic characteristics of participants.

Variables		Male		Female		Total	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Academic year	2022	102	35.2	188	64.8	290	49.4
	2023	84	28.3	213	71.7	297	50.6
Age	19	0	0.0	2	0.5	2	0.3
	20	6	3.2	18	4.5	24	4.1
	21	27	14.5	75	18.7	102	17.4
	22	49	26.3	254	38.4	203	34.6
	23	34	28.3	82	20.4	116	19.8
	24	32	27.3	36	8.0	68	11.6
	25 years old or older	38	20.4	34	8.5	72	12.3
Marital status	Single	180	96.8	370	92.3	550	93.7
	Married/Cohabiting	6	3.2	31	7.7	37	6.3
Self-rated financial status	Quite poor	21	11.3	20	5.0	41	7.0
	Not very well-off	64	34.4	104	25.9	168	28.6
	Neither well-off nor poor (moderate)	95	51.1	257	64.1	352	60.0
	Well-off	6	3.2	19	4.7	25	4.3
	Very well-off	0	0.0	0	0.0	0	0.0
Self-rated academic performance	Very poor	1	0.5	0	0.0	1	0.2
	Poor	5	2.7	7	1.7	12	2.0
	Fair	81	43.5	200	49.9	281	47.9
	Good	91	48.9	190	47.4	281	47.9
	Excellent	8	4.3	4	1.0	12	2.0

showed that the frequency of eating fruits, and having breakfast were significantly different based on financial status: students with middle-to-high financial status ate fruits and had breakfast more often than students with low financial status. The results of MANOVA for the interaction effect between gender and financial status showed no variables that were significantly different.

4 Discussion

The results of this study showed that the female students had more psychological symptoms than males, and students with financial difficulties experienced poorer wellbeing, greater psychological symptoms, lower social support, and less healthy dietary habits. Unlike previous studies (Ngin et al., 2018; Sok et al., 2020), this study examined the interaction effect between gender and financial status, but no significant effects were found. This suggests that the main effects of factors such as gender and economic status are more prominent. One possible explanation for the absence of a significant interaction is that Cambodia remains a male-dominated society (UN Cambodia, 2022), where female students, regardless of their economic circumstances, may generally experience poorer mental health compared to male students. Similarly, lower economic status has been consistently linked to worse mental health outcomes across genders (Lund et al.,

2010). From a statistical perspective, the study may have lacked sufficient statistical power to detect an interaction effect due to sample size limitations and imbalances in group composition. In our sample, no students reported being “very well off,” and only 4.3% reported being “well-off;” thus, for analysis, economic status was categorized into “poor” vs. “moderate or above.” Moreover, the sample had a gender imbalance, with female students comprising 68% of respondents. This distribution across gender and economic status groups may have reduced the statistical power for detecting interaction effects.

Overall, more than 40% of the students evaluated their health or mental health as good or normal, and the number of students who smoke and drink alcohol was relatively low. Regardless of gender or financial status, however, social trust in others was quite poor among many of the students.

4.1 Differences by gender

This study observed gender differences in dietary and exercise habits. Female students ate fruit more frequently than male students, which supports the finding of a previous study (Sok et al., 2020). According to Pengpid and Peltzer (2015), female students showed healthy dietary behaviors more often than did male students. However, the female students in the present study

TABLE 2 Mean scores and standard deviations for measures of health and health-related variables as a function of gender and financial status.

Variable		Gender				Financial status			
		Male		Female		Middle-High		Low	
		M	SD	M	SD	M	SD	M	SD
Wellbeing	Health rating	3.49	0.74	3.33	0.66	3.44	0.63	3.28	0.77
	Mental health rating	3.42	0.82	3.34	0.74	3.46	0.73	3.22	0.80
	Life satisfaction	5.52	1.29	5.55	1.13	5.75	0.94	5.17	1.45
Psychological symptoms	Loneliness	2.68	0.97	2.95	0.81	2.79	0.85	3.01	0.90
	Worry	2.76	0.94	2.98	0.89	2.86	0.88	3.00	0.96
	Thinking too much	2.90	1.02	3.14	0.81	2.99	0.90	3.20	0.85
Social trust and support	Trusting people	2.06	0.86	2.11	0.81	2.12	0.83	2.05	0.83
	Close people	2.53	0.92	2.29	0.74	2.45	0.80	2.23	0.79
	Feeling warm and trusted relationships	3.19	1.48	3.25	1.39	3.32	1.42	3.07	1.41
Dietary habits	Fast food	3.35	2.42	3.6	2.30	3.52	2.31	3.53	2.40
	Fruits	3.19	1.09	3.69	1.24	3.65	1.19	3.30	1.23
	Vegetables	5.02	1.30	5.14	1.35	5.17	1.25	4.97	1.47
	Soft drinks	3.57	1.36	3.35	1.49	3.34	1.46	3.56	1.43
	Breakfast	5.07	1.10	4.90	1.16	5.06	1.07	4.76	1.25
	Skipping meals	2.59	1.25	2.87	1.34	2.68	1.28	2.97	1.38
Exercise habits	Physical activity days	5.39	2.18	4.98	2.39	5.11	2.32	5.08	2.35
	Walking or riding days	4.50	2.93	4.96	2.80	4.75	2.88	4.92	2.77

skipped meals more often and had fewer physical activity days than the male students. Cambodian women are now facing the double burden of being either underweight or overweight (Greffeuille et al., 2016), including secondary school students (Yen et al., 2018). This indicates the need for female student teachers to develop appropriate dietary habits and to guide adolescent female students in educational settings in the future.

In addition, the female students showed more psychological symptoms, including feeling loneliness, worrying, and thinking too much, than the male students. Previous studies also showed that university students with poor mental health and depression were more likely to be female (Weitzman, 2004; Bayram and Bilgel, 2008). However, several other studies showed no gender differences in the prevalence of depression (Lei et al., 2016; Rotenstein et al., 2016; Akhtar et al., 2020). Based on these results, the mental health status of the subjects does not always yield consistent outcomes depending on a study's target population and design, highlighting the importance of considering the subjects' backgrounds.

Potential factors contributing to mental health issues among female students in the present study are the conflict between evolving social values and traditional gender roles, and the lack of social networks. The gross enrollment ratio of students in higher education in Cambodia was approximately 17.9%, with a slight difference between genders: 16.5% for males and 19.3% for females (Ministry of Education Youth, and Sport Cambodia, 2024). While some parents increasingly encourage education for their daughters, others may still view female education as less essential due to traditional gender norms, as outlined in the Chbab Srey

(Eng, 2016; Heng, 2022; Knapp et al., 2022). At the same time, as more women enter higher education, families increasingly expect them to contribute economically, believing that a degree could secure the long-term financial viability of both the student and the family (Evans-Lacko and Thornicroft, 2018). These traditional and emerging expectations may create conflicting pressures for female students in higher education, contributing to their stress and mental health challenges.

Additionally, one of the stress factors affecting students' life satisfaction depends on the availability of social support (Nou, 2013). Compared to the male students, the female students in the present study had a smaller number of close people that they can count on when having personal problems. This may affect female students' opportunity to obtain social support from others that could mitigate the stress they experience. Further research is needed to better understand mental health problems among female students pursuing higher education in Cambodia, and to examine how female student teachers build supportive relationships with others.

4.2 Differences by financial status

Students with low financial status had significantly poorer wellbeing and more psychological symptoms than those with middle-to-high financial status. All three variables for wellbeing (self-rated health, mental health, and life satisfaction) and for

TABLE 3 Correlation coefficients for relations between variables for each of the five measures of health and health-related variables.

Measure			
Wellbeing	1	2	3
1. Health rating	–		
2. Mental Health rating	0.51***	–	
3. Life satisfaction	0.24***	0.41***	–
Psychological symptoms	4	5	6
4. Loneliness	–		
5. Worry	0.45***	–	
6. Thinking too much	0.50***	0.63***	–
Social trust and support	7	8	9
7. Trusting people	–		
8. Close people	0.16***	–	
9. Feeling warm and trusted relationship	0.18***	0.32***	–
Dietary habits	10	11	12
10. Fast food	–		
11. Fruits	0.11**	–	
12. Vegetables	0.03	0.29***	–
13. Soft drinks	0.18***	0.09*	0.01
14. Breakfast	0.01	0.19***	0.20***
15. Skipping meals	0.20***	–0.02	–0.19**
*Continued	13	14	15
13. Soft drinks	–		
14. Breakfast	0.04	–	
15. Skipping meals	0.15***	–0.47***	–
Exercise habits	16	17	
16. Physical activity days	–		
17. Walking or Riding days	0.17***	—	

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

psychological symptoms (feeling loneliness, worrying, and thinking too much) were significantly lower compared to those of the students with middle-to-high financial status. These findings are consistent with previous studies, showing that university students with financial difficulties were more likely to experience depression (Lorant et al., 2003; Andrews and Wilding, 2004; Bostanci et al., 2005; Eisenberg et al., 2007; Richardson et al., 2017). Although all Cambodian TEC students are exempt from tuition fees and receive scholarship allowance from the government, there might still be financial challenges for the students, and these could potentially lead to low health status and the appearance of psychological symptoms among them.

Additionally, the results showed that students facing financial difficulties had fewer close people and warm and trusting relationships than those without such difficulties. This lack of social support may also cause them to experience mental health challenges.

The present study also indicated that students with financial difficulties often have poor diet habits. Previous research has shown that good diet quality is associated with mental wellbeing, whereas poorer diet quality is linked to higher levels of stress and anxiety among students (Solomou et al., 2023). Therefore, although it may be challenging to address all issues simultaneously, targeted support in specific areas such as promoting healthy eating habits, enhancing social support, and fostering opportunities for friendship-building within the university could help improve students' overall wellbeing.

4.3 Substance use and social trust among student teachers

Overall characteristics related to substance use and social trust were observed among the student teachers in this study regardless of gender or financial status. The number of students who drank alcohol and smoked was relatively low for both genders, although previous studies showed that male students smoked cigarettes and drank alcohol more often than female students (Peltzer and Pengpid, 2016; Sok et al., 2020). This may be because having a high level of education, such as attending university, and the specific characteristics of the field of education positively influence students against substance use. Socio-demographic characteristics such as higher school grade and older age have remained significantly associated with substance use (Yi et al., 2011), and higher education was significantly associated with less drinking among both men and women (Banta et al., 2012). Also, teachers were less likely to smoke than those in other occupations (Gilbert et al., 2015). Students in higher education and those who are aiming to become teachers form positive social norms such as avoiding substance use, which may influence their behavior as student teachers.

In this study, 7.8% of students strongly agreed that “most people can be trusted,” which is lower than the rates reported among adults in Vietnam (9% in urban areas, 35% in rural areas) and Laos (26.7% in urban areas, 15.5% in rural areas; Murakami, 2013). Additionally, 78% of students disagreed with the statement, exceeding the 55.4% reported in a 29-country Asian survey (Tokuda et al., 2010). This indicates comparatively lower social trust among Cambodian TEC students. This might be a negative impact of the conflicts in Cambodia. Social trust collapsed during the Khmer Rouge era, and it has been a negative influence on current society (Colletta and Cullen, 2009).

Although addressing the negative impact of past civil wars on people's mental health is a complex issue, promoting the development of reliable and supportive relationships with others is important. In western countries, high-quality social connections with friends and family members are associated with a reduced likelihood of depression (Werner-Seidler et al., 2017), and perceptions of higher levels of cognitive social capital including trusting of neighbors lowered the risks of developing depression (Fujiwara and Kawachi, 2008). It is thus necessary to examine how social capital functions in Asian cultures, particularly in Cambodia, which has experienced civil wars among people of the same ethnicity in the past. Based on this understanding, support programs aimed at fostering interpersonal relationships

TABLE 4 Multivariate and univariate analyses of variance for health and health-related variables.

Variable	MANOVA		ANOVA								
			Wellbeing								
			Health rating			Mental health rating			Life satisfaction		
	F	η^2	F	df	η^2	F	df	η^2	F	df	η^2
Gender	2.44	0.012	6.45*	1, 584	0.011	1.20	1, 585	0.002	0.14	1, 585	0.000
Financial status	12.74***	0.062	9.63**	1, 583	0.012	14.99***	1, 584	0.023	33.68***	1, 584	0.055
	F	η^2	Psychological symptoms								
			Loneliness			Worry			Thinking too much		
			F	df	η^2	F	df	η^2	F	df	η^2
Gender	5.23**	0.026	12.65***	1, 585	0.021	7.69**	1, 585	0.013	10.17**	1, 585	0.016
Financial status	5.09**	0.026	12.63***	1, 584	0.015	5.40*	1, 584	0.006	10.00**	1, 584	0.012
	F	η^2	Social trust and support								
			Trusting people			Close people			Feeling warm and trusted relationships		
			F	df	η^2	F	df	η^2	F	df	η^2
Gender	4.70**	0.024	0.34	1, 585	0.001	10.69**	1, 585	0.018	0.22	1, 585	0.000
Financial status	4.59**	0.023	0.86	1, 584	0.002	12.97***	1, 584	0.016	4.06*	1, 584	0.007
	F	η^2	Dietary habits								
			Fast food			Fruits			Vegetables		
			F	df	η^2	F	df	η^2	F	df	η^2
Gender	6.47***	0.063	1.52	1, 585	0.003	22.42***	1, 585	0.036	0.96	1, 585	0.002
Financial status	3.36**	0.034	0.07	1, 584	0.000	7.36**	1, 584	0.019	2.27	1, 584	0.005
	*Continued		Soft drinks			Breakfast			Skipping meals		
			F	df	η^2	F	df	η^2	F	df	η^2
Gender			3.12	1, 585	0.005	2.72	1, 584	0.005	6.01*	1, 583	0.010
Financial status			1.75	1, 584	0.005	10.67**	1, 583	0.016	8.36**	1, 582	0.011
	F	η^2	Exercise habits								
			Physical activity days			Walking or Riding days					
			F	df	η^2	F	df	η^2			
Gender	4.49*	0.015	4.24*	1, 585	0.007	3.23	1, 585	0.006			
Financial status	0.70	0.002	0.21	1, 584	0.000	0.99	1, 584	0.001			

F ratios are Wilks's approximation of F. ANOVA, univariate analysis of variance; MANOVA, multivariate analysis of variance.
MANOVA: df Wellbeing (3, 579), Psychological symptoms (3, 580), Social trust and support (3, 580), Dietary habits (6, 575), Exercise habits (2, 581).
* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.
Bold values indicate F-values that reached statistical significance.

that enhance students' mental wellbeing should be implemented in ways that align with the Cambodian context.

4.4 Suggestions for promoting student teachers' health

The results of this study have highlighted the importance of utilizing TECs as settings for health promotion. First, this study identified the necessity of supporting mental health and social relationships, particularly for female students and those facing financial difficulties. Students with financial challenges especially require support across various aspects of their school life, including

maintaining healthy diet habits. Additionally, this study pointed out that student teachers, in general, exhibit low social trust, suggesting the need for enhanced social support. From a Health-Promoting university perspective (Tsouros et al., 1998), effective health management and health education are required to address student teachers' health challenges, enhance their wellbeing, and cultivate healthy behaviors for their future roles as educators.

To support mental health, there is an urgent need for a mental health support system for students in educational settings alongside developments made in the medical sector. A review conducted across six ASEAN countries showed that despite the high prevalence of mental health issues, the willingness to seek professional help remains low. This might be because there is some

discrimination against mental health problems and a shortage of mental health care facilities (Jegannathan et al., 2015). Developing mental health services at primary levels is crucial as approximately one-third of mental health issues manifest before the mid-20s and are leading issues affecting educational achievement and career choices (Kessler et al., 2007; Mokdad et al., 2016). Although Cambodia's mental health services are still in a developmental phase (Schunert et al., 2012), TECs could introduce and strengthen mental health support systems that students could easily and regularly access in their daily lives. For example, existing health rooms at TECs could be utilized for on-site mental health drop-in (no-appointment) consultations.

Furthermore, it is essential for TECs to support students with financial difficulties. Although TECs provide tuition exemptions and government-funded scholarship allowance to all students, financial difficulties persist among some students. As these measures are already in place, and financial challenges are related to the economic status of students' families, the capacity of TECs to provide direct financial support remains limited. Research indicated that undergraduate students who receive social support from parents and peers had better money management practices (Cappelli et al., 2024). Therefore, TECs should first seek to understand the actual state of their students' daily living expenses, including family situations, and then implement adequate support measures. Moreover, TECs should prioritize providing social and psychological support to students facing financial hardships, such as through peer-mentoring schemes, while also focusing on mental health and fostering social relationships to enhance the students' overall wellbeing.

Finally, health education is essential for enabling student teachers to maintain their wellbeing and act as effective health promoters. To address rebuilding trust through education settings, TECs could integrate elements of peace education into the existing health education framework. In Cambodia, local NGOs have already been implementing peace education initiatives (Balvin and Miletic, 2020). Collaborating with such NGOs could provide culturally grounded content for peace through health education. Additionally, strengthening mental health literacy in schools has shown in reducing stigma and increasing help-seeking behaviors (Phoeun et al., 2019). Based on these findings, TECs could introduce mental health education and training for both student teachers and lecturers.

Moreover, health education for university students has been shown to increase healthy behaviors, such as adopting better dietary habits and engaging in regular physical activity (Abu-Moghli et al., 2010; Yang et al., 2020), and primary teachers who received health promotion training courses demonstrated improvements in their own healthy lifestyle behaviors (Ors, 2024). Embedding such programs in TEC curricula would equip student teachers with the skills to support both their own wellbeing and that of their future students throughout their teaching careers.

4.5 Limitations

This study has a few limitations. Firstly, it focused on the 4-year TECs in Cambodia and excluded the 2-year teacher training centers; Provincial Teacher Training Centers (PTTCs) and

Regional Teacher Training Centers (RTTCs). The 2-year programs admit students who have completed secondary school and provide two additional years of training, emphasizing practical teaching skills and not conferring a bachelor's degree. In contrast, the 4-year TEC programs also admit secondary school graduates but offer 4 years of training leading to a Bachelor of Education degree, with greater emphasis on theory, research, pedagogy, and practice (Tep, 2024).

The study sample comprised only 4th-year students at TECs in the capital city and a rural area. Therefore, it may not be possible to generalize the results to all student teachers in Cambodia. However, 2-year teacher training centers are also planned to be upgraded to 4-year TECs in the future, and the findings of this study are expected to contribute to discussions on student support services.

Secondly, this study used a self-administered questionnaire, which is based on subjective perspectives. This might have introduced certain negative or positive cognitive biases for each student's answers. Given that the participants were students at teacher education colleges, the possibility of socially desirable responding cannot be excluded. In future research, it will be necessary to include more objective data such as actual expenses and income among students.

In addition, mental health variables may not fully capture culturally specific idioms in Cambodia. For example, "thinking too much" carries distinct cultural meanings and has been shown to be useful in research with Cambodian populations (Hinton et al., 2015; Meyer et al., 2014). However, such measures may still overlook locally relevant expressions, particularly for students in this study. Future research should integrate culturally adapted tools to more accurately assess wellbeing in the Cambodian context.

Lastly, collecting the data from university students across various majors and comparing them with those of student teachers would be valuable in examining the unique challenges and solutions specific to future educators in Cambodia.

Despite these limitations, the findings of this study revealed the health status and health-related variables of student teachers based on the differences by gender and financial status and then proposed the support required at TECs. Further studies are needed to explore how cultural factors in the Cambodian context impact the wellbeing of female students pursuing higher education in university settings. It will also be necessary to investigate how students can build supportive relationships within their surroundings.

5 Conclusion

This study aimed to reveal gender and financial differences in health status and health-related factors among 4th-year students attending TECs in Cambodia to gain the insight necessary to support their health as future educators. The study showed that the female students had more psychological symptoms and a smaller number of close people compared to the male students. In addition, the wellbeing of the students who rated their financial status as low was worse, and they had more psychological symptoms and problems with diet habits than those with middle-to-high financial status regardless of receiving financial support from the government.

The results of this study suggested that TECs need to support the mental health of students, particularly female students and those with poor economic status. This support should also involve strengthening health promotion efforts within the university, such as offering mental health literacy programs and training for students and faculty, utilizing existing drop-in health rooms to provide accessible, appointment-free support, and expanding existing extracurricular clubs to promote social engagement. Moreover, there is a significant need to help students with low financial status to incorporate healthy dietary habits by investigating more details of their lifestyle and implementing support programs leading to a healthy lifestyle. These efforts will be important in mitigating the impact of sociocultural factors on student teachers' health.

Findings from this study can inform teacher-education curricula and support the development of health-promoting universities, contributing to policy and practice aimed at improving the wellbeing of future educators.

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 Ethical Committee of Tokyo Gakugei University. 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

MU: Investigation, Writing – original draft, Writing – review & editing, Conceptualization, Data curation, Formal analysis, Methodology. TA: Funding acquisition, Investigation, Methodology, Supervision, Formal analysis, Validation, Writing – review & editing, Conceptualization. HM: Supervision, Methodology, Formal analysis, Validation, Writing – review & editing, Conceptualization. YM: Investigation, Data curation, Writing – review & editing. KL: Investigation, Data curation, Writing – review & editing. ST: Investigation, Data curation,

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Funding

The author(s) declare that financial support was received for the research and/or publication of this article. This work was supported by the grant of The Nippon Foundation [grant number 2025015670]. The funding source had no role in the design of this study, interpretation of the data, or decision to submit results.

Acknowledgments

Authors would like to express our gratitude to the students and lecturers at Teacher Education College who cooperated with this research. We would also like to acknowledge the financial support by The Nippon Foundation.

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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