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Factors associated with quality of life among Palestinian university students: a cross-sectional study

Reem Abu Alwafa[a], Rana Zahdeh[b], Souzan Zidan[c], Andreas Hahn[d], JanPhilipp Schuchardt[d] and Manal Badrasawi[a]

[a]Department of Nutrition and Food technology, Faculty of Agriculture and Veterinary Medicine, An-Najah National University, Nablus, West Bank, Palestine; [b]Department of Applied Chemistry, Palestine Polytechnic University, Hebron, Palestinian Territories; [c]Department of Nutrition and Food Technology, Faculty of Agriculture, Hebron University, Hebron, West Bank ,Palestine; [d]Institute of Food Science and Human Nutrition, Leibniz University Hannover, Am kleinen Felde 30, Germany

ABSTRACT

This study determined the Quality of life of Palestinian university students and its associated factors. A total of 173 students were included in this cross-sectional study. The collected data were; QoL, lifestyle, dietary pattern, and demographic data. The results revealed, the physical domain was associated with younger age, screen time and physical activity, while study time were associated with the environmental domain. Students' sleep problems were significantly associated with lower QoL scores in both physical and psychological domains. Less studying, napping during the days and more family income improved university students QoL. In conclusion, sociodemographic and life style factors were associated with students' QoL Exploring the factors that influence the QoL will aid in the development of supportive programmes and policies to improve the QOL of students that will shape their country's future. further effort is needed to establish programmes to promote knowledge about lifestyle and QoL among university students.

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KEYWORDS
Quality of life; university students; life style; determinants

Background

Quality of life (QoL) has many applications in the medical field, and is well known as a reference for assessing health status in health-related research (Joslin et al., 2014). The World Health Organization (WHO) defines QoL as a person's perception of his or her position in life in accordance with the value and cultural systems in which he or she lives, and in accordance with his or her concerns, goals, and expectations. QoL is a multidimensional concept that reflects an individual's beliefs, physical and mental health, interactions with the environment, and economic situation (Sinha, 2019). Furthermore, QoL is important because it encompasses the individual's essence, physiological aspects, and performance (Montazeri et al., 2017).

Over the past few decades, it has been shown that it is very important to assess the QoL in educational institutions (Ziapour & Kianipour, 2018). Indeed, it is well recognized that public learning is first and foremost a social process that has a significant impact on the lives of young people. In this context, particular attention has been paid to a sample of university students and their lives during their educational journey, in which they encounter a variety of stressors and challenges, including

CONTACT Manal Badrasawi m.badrasawi@najah.edu

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emotional, psychological, social, as well as academic difficulties (Leontopoulou & Triliva, 2012) and financial constraints (Vakkai et al., 2020).

Several studies have suggested that the quality of the university experience is perceived by students according to academic performance and attrition rates (Aina et al., 2022). However, the assessment of University student's QoL in is a more comprehensive process, based on a variety of factors such as the type of University, demographic characteristics, medical profile as well as lifestyle habits (Ziapour & Kianipour, 2018).

A previous study showed that living with family, engaging with associations or teams, and physical activity were positively correlated with higher QoL domains among university students (Nowak et al., 2019). On the other hand, living in difficult conditions has been reported to negatively affect individuals' QoL (Ribeiro et al., 2018). It was discovered that QoL and many demographic parameters were negatively associated in Palestine. Such characteristics were marriage, working 15 hours or more daily, and poverty. Higher living standards were associated with a stronger sense of well-being. Furthermore, staying in refugee camps was linked to lower levels of well-being (Bdier et al., 2023).

Concerns about patients' health-related QoL have grown as mortality statistics alone are insufficient to capture the entire effect of chronic disorders. Chronic disorders, particularly multimorbidity, contribute significantly to the disease burden on individuals and society. Disease has been linked to a reduction in health-related quality of life (Van Wilder et al., 2022). A number of studies have been undertaken in Palestine on the quality of life of people suffering from various chronic diseases (Abu Hamdeh et al., 2022; Al-Jabi et al., 2019; Tietjen et al., 2021; Zyoud et al., 2016).

The contribution of lifestyle factors in chronic diseases prevention has sparked significant interest. Tobacco smoking, body mass index (BMI), and physical activity are key factors that impact quality of life (QoL). Lifestyle and behavioural alterations can impact these factors (Organization, 2004; Renehan & Howell, 2005).

Nutrition and dietary factors have also been found to be associated with QoL (Godos et al., 2023; Organization, 2004). It has been shown that health-related QoL can be partly determined by food choices. In nutritional epidemiology studies, taking dietary patterns into account rather than particular food or nutrients is now considered groundbreaking. The entire dietary pattern provides a more accurate representation of eating patterns. Moreover, it can provide an insight on the foods' synergistic or antagonistic effects when consumed with each other. According to the literature, the typical Mediterranean diet has a positive relationship with health-related QoL (Galilea-Zabalza et al., 2018). The Mediterranean dietary pattern refers to a set of dietary practices that have been followed by populations living in the Mediterranean area, which have the following key characteristics: eating whole grains, fruit and vegetable as the main sources of fibre, vitamins and minerals on a daily basis along with frequently consuming legumes, seeds and nuts. olive oil is the common dressing and key source of fats, fish, dairy products, and eggs are the major dietary sources of protein and healthy fat, limited consumption of processed meats and sweets, and moderate consumption of alcohol (Godos et al., 2023). QoL assessment should be included in health improvement and monitoring programmes. Programmes specifically designed to improve QoL should be based on scientific evidence and implemented through the joint efforts of all research, health care, and government institutions (Marquez et al., 2020). In addition, assessing the QoL of university students allows researchers to better understand their general condition, to evaluate the long-term impact of the educational process, and thus to guide policy makers towards specific and appropriate interventions to improve students' QoL.

The long-term effects of war on QoL are detrimental; these include increased rates of poverty, unemployment, violence in communities, poor living conditions, and disruptions to social networks in war-affected places (Bdier et al., 2023). Palestinians have experienced protracted bloodshed, displacement, and conflict since the 1940s (Nasr et al., 2021). The whole population in Palestine is still suffering from the war-torn environment conditions they live in including military invasions, house evictions, detentions, physical injuries, losing loved ones, and the

vulnerability to immediate risk of life and injury of loved ones (Bdier et al., 2023). According to studies, Palestine's QoL was determined to be the lowest among all populations worldwide, particularly when it came to the environmental, psychological, and physical QoL categories (Jalala et al., 2024). Previous research has indicated that the difficult living conditions Palestinians experience – such as poverty, a lack of work possibilities, economic independence, the absence of justice and equality, and future insecurity – have a negative impact on their QoL. Furthermore, conditions created by the war were found to be significantly associated with bad health-related QoL among adults in Palestine (Bdier et al., 2023). Several QoL studies have been published on groups with different medical conditions in Palestine like Haemodialysis patients (Zyoud et al., 2016), hypertension patients (Al-Jabi et al., 2019), rheumatoid arthritis patients (Abu Hamdeh et al., 2022), and type 2 diabetes patients (Tietjen et al., 2021). Other studies investigated the QoL in Palestine in children (Massad et al., 2011; Veronese et al., 2014), postpartum mothers (Hammoudeh et al., 2009), and Elderly (Elsous et al., 2019). QoL among Palestinian university students has been addressed in a study by Asi et al. (2018), were the 36-item short form health survey questionnaire (SF-36) was used to measure the health related QoL. Only Insecurity measures and demographic variables associations with QoL were investigated (Asi et al., 2018).

Studying the QoL of university students will provide insight into the various elements of QoL, such as physical and mental health, for this age group. Evaluating these dimensions and understanding the different elements that may be influencing them in this youth population will aid in the development of supporting programmes and strategies aimed at improving the QoL of the population group that will shape their country's future. The assessment of QoL should be based on self-report by the individual and cover the relevant domains of daily functioning (social, physical, mental). The WHO Quality of Life Assessment Brief (WHOQoL-BREF) instrument provides a comprehensive, psychometrically sound, and efficient way of assessing QoL from the individual's perspective by scoring standardized responses to standard questions. Therefore, the present study aims to assess the QoL among Palestinian university students using the WHOQoL-BREF instrument and its association with demographic characteristics (e.g. gender, city, place of residence, marital status, type of housing, academic year, family income per month, source of funding), lifestyle habits (e.g. smoking, sleep problems, sleep duration, physical activity level), medical history and body weight status, and adherence to Mediterranean lifestyle habits.

Methodology

Study design, settings, and population

The current study used a cross-sectional design. University students were selected from the Palestine Polytechnic University, which has two campuses in the City of Hebron, Palestine.

Hebron is located in the southern West Bank (Arij, 2009). The city's centre has been physically separated from the rest of its areas through the deployment of physical barriers and other ways. Access restrictions have had a far-reaching influence on many aspects of life, including the severe division of Palestinians' familial and social fabric, with devastating consequences for the people's dignity and emotional well-being (OCHA, 2019). Hebron was formerly a thriving commercial and manufacturing hub (Badil, 2016). Hebron's population depends largely on the trade industry for a living, accounting for over half of the total workforce. While agriculture and industry employ 30% of the workforce (Arij, 2009).

Hebron's population depends largely on the trade industry for a living, accounting for over half of the total workforce. While agriculture and industry employ 30% of the workforce (Arij, 2009).

Palestine Polytechnic University is a medium-sized university that serves over 8000 students across two campuses (Ppu, 2023). The Palestine Polytechnic University enrols students from across the West Bank.

The study protocol was approved by the Deanship of Scientific Research Ethical Committee at the Palestine Polytechnic University (reference number KA/41/2019). Prior to data collection, written and verbal informed consent was obtained from all subjects. The study was conducted in accordance with the principles outlined in the Declaration of Helsinki.

Inclusion criteria, recruitment and sampling method

Inclusion criteria were university students aged between 18 and 22 years who agreed to participate and to provide all the required data, while pregnant and breastfeeding women, those with either coeliac disease or inflammatory bowel disease, those who refused to participate, those who refused to sign a written consent form, and those with incomplete responses were excluded from the study.

The study participants were selected using a simple random sampling. The recruitment process for participants included the following steps: The university registration office was asked to conduct a random selection process of students from all faculties and years of study, using the university's student database. However, the university database solely encompasses details regarding age, gender, faculty, major, and year of study, lacking information on other criteria essential for study participation. Inclusion criteria were reviewed separately. Initially, a total of 100 invitation emails were sent to the selected students with detailed information about the study objectives and the data required. Contact numbers for the research team were also provided. Students who agreed to participate were asked to contact the research team via WhatsApp or email to verify their eligibility. Those students who met the eligibility criteria were then scheduled for data collection. Subsequent groups of students were selected and invited in a similar way until the desired sample size was reached. A total of 520 students were invited in 5 rounds, with approximately 100 students invited each time.

Ethical considerations

The research protocols adhered to the Declaration of Helsinki and were reported in line with the STROBE checklist for reporting cross-sectional studies. The study protocol was approved by the Deanship of Scientific Research Ethical Committee at the Palestine Polytechnic University (reference number KA/41/2019). Informed written and verbal consent was obtained from all participants prior to data collection.

Data collection and research tools

Data collection were collected face-to-face by using a pre-tested questionnaire divided into seven sections: 1) demographic information, 2) medical history, 3) body weight status, 4) lifestyle habits, 5) adherence to Mediterranean lifestyle habits, and 6) QoL. The team of four researchers collected the data over a four-months period from June 2021 till October 2021. Institute's staff verbally informed the students about the purpose of the study, the type of data that would be collected, and that their participation was voluntary. Students who agreed to sign a consent form were included in the data collection.

Demographic information

The collected demographic information were gender, age, governance (Hebron, Ramallah, Nablus, Tulkarm, Jenin, Bethlehem), marital status (single, married), area of living (city, villages, camps), residence during studying years (with family (parents), with relatives, student housing), and family income per month (<1500 New Israeli Shekel (NIS), 1500–5000 NIS, more than 5000 NIS). Educational information including major (graduate studies, medicine and health sciences, engineering, information technology and computer engineering, administrative sciences and information systems, applied sciences, and applied professions), academic year (1online, 2nd, 3rd, 4th, 5th, 6th, higher

education, graduated), and study funding (family, scholarship, family and scholarship, other) were also collected from each participant.

Medical history

Information on health status was obtained by asking participants three main questions: 1) whether they had any chronic diseases; if so, 'please state the disease and its duration', 2) whether they had ever undergone surgery; if so, 'please state when'; and 3) whether they regularly took any medication; if so, 'please state the medication and purpose of its use'.

Body weight status

The weight status of the study participants was assessed by anthropometric measurements (weight and height). Measurements were taken in duplicate and the mean was recorded. Body mass index was calculated as body weight in kilograms divided by height in metres squared (kg/m2) and then classified according to WHO cut-off points (Who, 2019).

Lifestyle habits

Lifestyle habits focused on three main items; smoking, sleep pattern and physical activity levels. Information on smoking was obtained by asking participants if they smoked. Participants who answered 'regular smoker', or 'irregular smoker' were asked about the duration of smoking (years, months), then whether they smoked cigarettes or shisha, and the number of cigarettes smoked per week or the number of shisha smoked per week.

The assessment of participants' sleep patterns was done by asking about sleep duration, wake time, sleep duration, whether they take a nap, whether they have any sleep problems; if the answer is yes, 'mention the sleeping problem you have', screen time (i.e. social media), leisure time and study time durations.

Participants' physical activity levels were also assessed using the Short Form of International Physical Activity Questionnaire (IPAQ). According to the IPAQ scoring protocol, the metabolic equivalent. minutes per week (MET.min/week) were calculated for each of walking, moderate- and vigorous intensity activities (IPAQ, 2021). A score of ≤3 MET indicates low level of physical activity, a score of 3–6 MET indicates moderate level of physical activity, and a score of ≥6 MET indicates vigorous physical activity (Ainsworth et al., 2000).

Adherence to Mediterranean lifestyle habits

Palestine, like other Mediterranean countries, has been undergoing a nutritional transition in recent years, moving from a traditional Mediterranean to a 'Westernized' diet (Hamdan et al., 2020). Participants' adherence to the Mediterranean lifestyle habits was assessed using the MEDLIFE index design (Gil et al., 2015). The original tool is a twenty-eight-item derived index consisting of items related to the frequency of food consumption (fifteen items), Mediterranean dietary habits (seven items), and physical activity, rest, social habits and sociability (six items) (Gil et al., 2015).

The questionnaire was translated into Arabic by an official translator, using the 'back and forth' method. Content validity was then carried out by sending the questionnaire to an expert reference group (a nutritionist and two researchers), who agreed to remove the item 'alcohol consumption' from the first block of the questionnaire, as alcohol is prohibited in Islam (the major religion in Palestine). In the current study, the items were scored as either 0 or 1, and the sum of the item scores was divided into tertiles, with participants allocated in the lowest tertile were considered to have low adherence to the Mediterranean lifestyle habits.

Quality of life (QoL)

Participants' QoL was measured using an Arabic version of the WHOQoL-BREF instrument, which is a reliable and valid tool in Arab populations (Ohaeri & Awadalla, 2009). The WHOQoL-BREF instrument consists of 26 items and is designed to assess four main domains: psychological health,

physical health, environment, and social relationships (Group, 1998). Each item is rated on a 5-point Likert scale, and then the scores of all four domains are summed and scaled in a positive direction, with higher scores indicating better QoL (Group, 1998).

Sample size calculation and data analysis

The sample size was determined using openEpi software for sample size calculation for finite population. Open Epi is A Web-based Epidemiologic and Statistical Calculator for Public Health (Sullivan et al., 2009). The required statistical test was mean difference. The mean and standard deviation for QoL were obtained from previous studies (mean±sd: 77.4 ± 24.7) (Asi et al., 2018). The effect size was determined based on the expected difference from the previous study. The power of the study was set at 80%, and the level of significance (alpha) was considered to be 0.05. The first sample size calculation yielded a value of 169 participants. However, in order to accommodate a probable dropout rate of 15%, the sample size was subsequently increased to 196, which was then rounded up to 200 participants.

Data analysis was performed using the statistical package for the social sciences SPSS version 21. Continuous variables were assessed for normality of distribution graphically and using the Kolmogorov-Smirnov test. Descriptive analysis, including the means and standard deviation (SD), was used to analyse continuous variables, while categorical variables were described in percentages and frequencies. Independent t-test and ANOVA were used to determine the differences between the selected variables. Pearson's correlation coefficient (r) was also used to investigate the association between the QoL and continuous variables (MET score, BMI, sleep time, study time, screen time, age, MEDLIFE score, sleep). The significance level was set at $p < 0.05$.

Results

Recruitment

A total of 520 university students were invited to participate in the cross-sectional study, of which 200 participants met the inclusion criteria and signed a written consent form. 173 participants were included in the final analysis. The remaining participants were excluded mainly due to non-existent or incomplete responses, as shown in Figure 1.

Participants' characteristics

A total of 173 university students participated, of whom 72.3% were female and 27.7% male. Their mean age was 20.14 ± 1.60 years, ranging from 18 to 27 years. Detailed socio-demographic characteristics are shown in Table 1.

Table 2 shows the medical history and lifestyle characteristics of the participants, 95.9% of the participants reported no chronic diseases. 85.8% of the participants had not undergone surgery or taken any medication. 27.7% had sleep problems. 2.4% of the participants smoked regularly, 24.9% were inactive, 46.2% were moderately active, and 28.9% were very active. The data also showed that 63.4% of the participants had a low, 31.2% a moderate and 32.4% a high adherence to the Mediterranean lifestyle.

QoL and its associated risk factors

With regard to the domains of QoL and as shown in Figure 2, the physical domain had the highest score, followed by the social relationship domain, the psychological domain and finally the environmental domain. The participants' self-assessment of QoL showed that 50.9% of them were satisfied with their QoL, and 39.9% were satisfied with their health (Table 3).

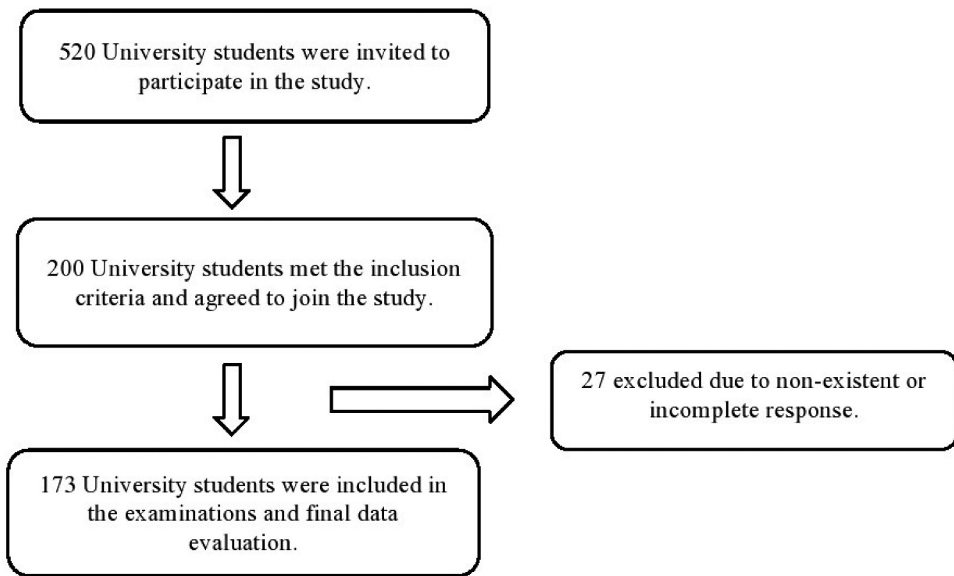

Figure 1. Flowchart describing the recruitment of study participants.

The findings showed that certain demographic variables (marital status, and major) were significantly associated with the environmental domain scores. It was also found that participants with a family income of more than 5000 NIS per month had significantly higher scores in both the physical and environmental domains. The detailed results are presented in the supplementary table S1. When students were compared in terms of medical history, body weight status, and adherence to the Mediterranean lifestyle habits, QoL scores did not show significant differences in all domains, as shown in Table 4. However, the analysis showed that participants who smoked regularly had higher scores for psychological health and social relationships. The results also demonstrated that students who smoked cigarettes and those who had sleep problems had significantly lower physical and mental health scores. It was also found that participants who weren't used to napping had higher scores for social relationships, as shown in Table 4.

The relationship between QoL domains and continuous variables (e.g. age, MET score, study time, screen time, sleep time, MEDLIFE score, BMI) was examined using Pearson's correlation as shown in Table 5. Both the physical and psychological domains were significantly ($p < 0.05$) negatively correlated with screen time. The environmental domain was also found to be significantly negatively correlated with age, MET score, and study time. In addition, no significant associations were found between the QoL domains and the participants' MEDLIFE categories or scores.

Discussion

Assessing QoL in young people is becoming increasingly important, as it helps decision-makers and researchers to assess the long-term impact of health and social policies and to develop health promotion strategies for university students. The WHOQoL tool can measure QoL in different settings and populations. Understanding the various factors that may be influencing the QoL of this demographic will help to build supportive programmes and policies targeted at enhancing the quality of life of the population group that will shape their country's future.

This study showed that the highest mean score was for the physical health domain, followed by social relationships, then psychological health and finally the environmental domain. These results suggest that physical health and social relationships may have

Table 1. Participants' demographic characteristics.

Variable		Total (N = 173)	
		Number (N)	Percentage (%)
Gender	Male	48	27.7
	Female	125	72.3
Governance	Hebron	150	86.7
	Ramallah	1	0.6
	Nablus	4	2.3
	Tulkarm	7	4
	Jenin	5	2.9
	Bethlehem	6	3.5
Marital status	Single	170	98.3
	Married	3	1.7
Area of living	City	125	72.3
	Villages	43	24.9
	Camps	5	2.9
Residence during studying years	With family (parents)	150	86.7
	With relatives	2	1.2
	Student housing	21	12.1
Discipline	Graduate studies	1	6
	Social sciences	11	6.4
	Natural Sciences	155	89.6
	Applied professions	6	3.5
Academic year	1online	16	9.2
	2nd	52	30.1
	3rd	35	20.2
	4th	40	23.1
	5th	12	6.9
	6th	1	0.6
	Higher education	1	0.6
	Graduated	16	9.2
Family income per month	<1500 NIS	6	3.5
	1500–5000 NIS	111	64.2
	More than 5000 NIS	56	32.4
Study funding	Family	142	82.1
	Scholarship	19	11
	Family & Scholarship	7	4
	Other	5	2.9

a stronger influence on QoL than the other two domains. The higher score for the physical health domain also includes good work capacity, good activities of daily living, less pain and discomfort, and enough energy. Similar results were found in a study among Vietnamese dentistry students in 2020 using the WHOQoL-BREF instrument (Vo et al., 2020). However, in contrast to our study, the environmental domain had the highest score in a study from Saudi Arabia (Malibary et al., 2019). Many factors could explain this difference, such as the intermittently eruptive context in Palestine (Bdier et al., 2023) compared to the stable political and economic conditions in Saudi Arabia.

In the sample analysed, single participants were found to have higher scores in the environmental domain when compared to married participants. Which agrees with the findings of a previous in Palestine (Bdier et al., 2023) and another study in Iran (Ziapour & Kianipour, 2018). It was found that that marital status was significantly correlated with QoL and its subscales among university students. However, this is in contrast to the findings of previous study conducted in Iran on heart failure patients (Nasiry Zarrin Ghabaee et al., 2015). One of the possible reasons for the current result is that a single person may not have the responsibility of a spouse especially in a war-affected country like Palestine were poverty, unemployment, and future insecurity are common (Bdier et al., 2023). Furthermore, the age difference in these studies could explain the variation in the marital status effect on QoL, as younger couples may experience greater obstacles than long-term stable married couples.

Table 2. Participants' medical history and lifestyle habits.

		Total (*N* = 173)	
		Number (N)	Percentage (%)
Medical history			
Chronic disease	Yes	7	4.1
	No	163	95.9
Surgery	Yes	24	14.2
	No	145	85.8
Medication	Yes	7	4
	No	166	96
Lifestyle habits			
Smoking	Non-smoker	144	85.7
	Irregular smoker	20	11.9
	Regular smoker	4	2.4
Type of smoking	Cigarette	2	8.7
	Pipe (shisha)	19	82.6
	Both	2	8.7
Nap	Daily	27	15.6
	5–7 days/week	22	12.7
	3–4 days/week	23	13.3
	1–2 days/week	59	34.1
	Never	42	24.3
Physical Activity	Inactive	43	24.9
	Moderate	80	46.2
	High	50	28.9
Mediterranean lifestyle habits	Low adherence	63	36.4
	Moderate adherence	54	31.2
	High adherence	56	32.4

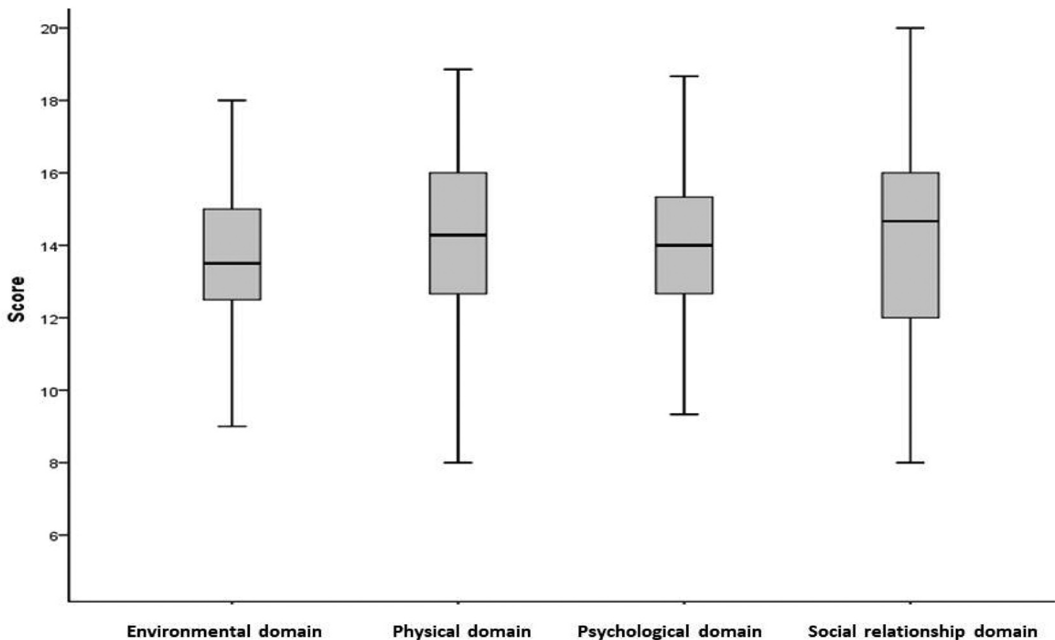

Figure 2. Participant's quality of life domain scores.

Table 3. Participants' self-assessed QoL.

	How do you evaluate your life quality? N (%)	How satisfied are you with your health? N (%)
Absolutely not satisfied	4 (2.3)	6 (3.5)
Not satisfied	8 (4.6)	26 (15)
Neither satisfied nor dissatisfied	52 (30.1)	54 (31.2)
Satisfied	88 (50.9)	69 (39.9)
Completely satisfied	21 (12.1)	18 (10.4)

There was an inverse correlation between the average scores in the environmental domain and the age of the participants. In fact, the study showed that younger participants scored higher in the environmental domain. This result was consistent with the findings of other studج conducted by (Nasiry Zarrin Ghabaee et al., 2015) and inconsistent with the findings of a previous Iranian study (Amiri et al., 2014). This could be explained by the fact that ageing is associated with physical limitations and reduced physical activity, which in turn affects QoL.

With regard to study discipline in our study, students who studied social sciences had significantly higher scores in the environmental domain compared to graduate students and those who studied natural and applied science professions. This finding is in line with those of studies in Italy (Backhaus et al., 2020) and Serbia (Milic et al., 2020) which showed significant differences in the QoL according to study disciplines and faculties. One possible explanation is that students of social sciences and humanities may have stronger social support and better personal relationships than students of other faculties.

There is a paucity of research exploring the relationships between participants' QoL and their families' economic status. The results of the current study showed that family income per month was significantly associated with the physical and environmental domains. This finding was consistent with a Serbian study, which indicated that the monthly family income was positively correlated with participants' total SF-36 score (Pekmezovic et al., 2011). A study by Sjoberg et al (Sjöberg et al., 2005). also found a positive association between family employment status and depression. Higher household income may enable access to more resources and opportunities, hence improving physical and environmental QoL.

The most striking finding to emerge from our data was that sedentary participants reported significantly higher mean scores in the environmental domain, and correspondingly, participants with high levels of physical activity had poorer QoL. This finding contradicts the findings of another study conducted in Siberia, which showed a significant increase in the total SF-36 score with increasing of frequency of physical activity (Pekmezovic et al., 2011). Moreover, many research confirmed that physical activity contributes to better QoL (Gill et al., 2013). This result may be explained by assuming that participants with poorer QoL in our study use physical activity as way to cope.

Surprisingly, the results of the present study showed that the MEDLIFE score wasn't associated with participants' QoL in all domains. This is in contrast to previous studies (Bonaccio et al., 2013; Galilea-Zabalza et al., 2018; Pérez-Tasigchana et al., 2016), which have shown that adherence to the Mediterranean diet is directly associated with higher health-related QoL. The Mediterranean diet's positive impact on physical health may be explained by a variety of processes. Following a Mediterranean diet has been linked to improved endothelial function, a lower level of low-grade inflammation, and a better profile of coagulation indicators. Nutrients such vitamins, minerals, antioxidants, and omega-3 and monounsaturated fatty acids are abundant in the Mediterranean diet and have been shown to have positive health impacts (Henríquez Sánchez et al., 2012). Research revealed that eating a Mediterranean diet is linked to a lower risk of developing some cancers, a lowered chance of developing cardiovascular disease, and even improved results for mental and cognitive health (Sánchez-Sánchez et al., 2020).

Table 4. Relationship between QoL domain scores and medical history and lifestyle.

		Physical		Psychological		Social Relationships		Environment	
		Mean ± SD	*p*-value	Mean ± SD	*p*-value	Mean ± SD	*p*-value	Mean ± SD	*p*-value
Medical History									
Chronic disease	Yes	76.3 ± 11.39	.297[a]	51.4 ± 16.27	.346[a]	60.6 ± 7.01	.368[a]	55.4 ± 11.18	.774[a]
	No	71.6 ± 11.72		55.1 ± 9.73		57.2 ± 9.87		54.5 ± 8.56	
Surgery	Yes	75.1 ± 11.22	.128[a]	57.4 ± 9.60	.186[a]	57.9 ± 13.3	.780[a]	57.5 ± 8.45	.073[a]
	No	71.2 ± 11.80		54.5 ± 10.10		57.3 ± 9.10		54.1 ± 8.60	
Medication	Yes	71.0 ± 12.10	.886[a]	53.3 ± 17.41	.683[a]	60.9 ± 11.04	.298[a]	54.9 ± 9.90	.879[a]
	No	71.67 ± 11.72		54.9 ± 9.62		57.0 ± 9.69		54.3 ± 8.64	
Lifestyle habits									
Smoking	Non-smoker	72.6 ± 10.67	.125[b]	55.2 ± 9.45	.017[*b]	57.9 ± 9.25	**.012**[*b]	54.8 ± 8.00	.093[b]
	Irregular smoker	67.3 ± 15.58		52 ± 8.28		51.7 ± 11.39		51.4 ± 10.40	
	Regular smoker	75.7 ± 13.29		66.7 ± 11.31		64.0 ± 13.06		60.5 ± 15.26	
Type of smoking	Cigarette	44.3 ± 6.06	**.009**[**b]	40.0 ± 0.00	**.033**[*b]	37.3 ± 0.00	.138[b]	32 ± 2.83	**.001**[**b]
	Pipe (shisha)	72.9 ± 12.86		56.8 ± 9.58		55.6 ± 12.26		56.4 ± 8.93	
	Both	52.9 ± 18.18		45.3 ± 7.54		50.7 ± 11.31		38 ± 2.83	
Nap	Daily	72.7 ± 9.61	.185[b]	53.1 ± 8.49	.614[b]	56.4 ± 8.26	.039[*b]	55.9 ± 9.31	.434[b]
	5–7 days/week	67.4 ± 12.82		54.8 ± 10.68		53.7 ± 9.78		53.5 ± 7.97	
	3–4 days/week	73.5 ± 10.31		57.3 ± 9.48		60.6 ± 9.35		55.1 ± 7.16	
	1–2 days/week	70.3 ± 12.16		54.1 ± 9.42		55.7 ± 9.57		52.8 ± 9.72	
	Never	74.0 ± 12.02		55.7 ± 11.52		59.7 ± 10.30		55.6 ± 7.71	
Sleep problems	Yes	65.9 ± 12.30	**.000**[**a]	50.8 ± 11.00	**.001**[**a]	54.9 ± 9.34	.060[a]	52.8 ± 8.46	.140[a]
	No	73.9 ± 10.70		56.4 ± 9.14		58.0 ± 9.79		54.9 ± 8.70	
Physical Activity	Inactive	72.1 ± 11.11	.910[b]	54.2 ± 10.44	.847[b]	57.1 ± 8.21	.834[b]	55.8 ± 7.90	.213[b]
	Moderate	71.2 ± 11.38		54.9 ± 9.48		57.6 ± 10.13		54.6 ± 8.36	
	High	71.9 ± 12.86		55.4 ± 10.51		56.6 ± 10.44		52.7 ± 9.64	
Body weight status									
BMI	Underweight	71.8 ± 11.50	.377[b]	56.5 ± 7.67	.877[b]	56.5 ± 9.67	.987[b]	58.5 ± 6.71	.053[b]
	Normal	71.2 ± 11.96		54.6 ± 10.2		57.2 ± 9.42		53.2 ± 9.27	
	Overweight	75.2 ± 9.56		55.4 ± 9.17		57.4 ± 10.13		56.4 ± 5.53	
	Obese	68.8 ± 13.18		54.1 ± 12.95		57.7 ± 13.45		56 ± 7.79	
Adherence to Mediterranean Lifestyle habits									
MEDLIFE score	Low	71.5 ± 11.17	.973[b]	54.9 ± 9.21	.750[b]	57.7 ± 10.01	.534[b]	55.2 ± 7.37	.362[b]
	Medium	71.5 ± 12.01		55.6 ± 9.82		55.9 ± 10.05		53.0 ± 9.89	
	High	71.9 ± 12.18		54.1 ± 11.03		57.8 ± 9.17		54.7 ± 8.76	

[a]Independent t-test; [b]Anova test.
$^*p < 0.05$; $^{**}p < 0.01$.

Table 5. Correlation between each of WHOQoL-bref domains and continuous variables.

Variable	Physical		Psychological		Social Relationships		Environment	
	Correlation Coefficient	*p*-value	Correlation Coefficient	*p*-value	Correlation Coefficient	*p*-value	Correlation Coefficient	*p*-value
Age	.013	.863	−.020	.795	−.116	.129	−.157*	**.040**
Physical activity MET	−.035	.649	−.071	.352	−.113	.139	−.154*	**.044**
Study time	−.113	.144	−.012	.880	.000	.996	−.237**	**.002**
Screen time (e.g. TV & social media)	−.234**	**.002**	−.209**	**.006**	−.028	.718	.020	.799
Sleep time	.088	.250	.009	.907	.097	.204	.089	.244
MEDLIFE score	.037	.632	.053	.488	.031	.688	.037	.633
BMI	−.007	.928	−.001	.985	.015	.841	.044	.563

*Correlation is significant at the level 0.05.
**Correlation is significant at the level 0.01.

Limitations

The current study had several methodological limitations that should be mentioned. The sample was selected from only one university, which means that the findings may not be representative of all university students in Palestine. Future studies should be conducted with a larger sample from different universities in Palestine. The low response rate among the invited students may be due to the fact that the data collection took place during the summer course. It is possible that the students did not check their email or were not enrolled in the summer course. The data were collected using the self-report methods, which is likely to affect the accuracy of the findings. Individual differences in the study sample may affect the generalizability of the findings. In this regard, it is recommended that further comparative studies are conducted to reach a consensus on this issue. Finally, although using the WHOQoL-BREF instrument was used to assess QoL among university students, the use of more comprehensive techniques (e.g. the SF-36 QoL questionnaire) may provide more accurate results. Nevertheless, we believe that our study is the first of its kind to assess the effect of different variables on the QoL among university students in Palestine.

Conclusion

Students' QoL was found to be associated with a number of modifiable factors. Higher QoL scores were associated with less time spent studying, napping three to four days per week, and a higher monthly family income. On the other hand, more time spent in front of screens and sleep problems were associated with lower QoL scores. Further research is needed to investigate how these factors influence QoL, and to implement programmes and strategies to raise the awareness of these lifestyle and socio-economic factors in order to improve the QoL among Palestinian university students.

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