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Research Article

Physical Activity and Quality of Life Among Saudi Female Students

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Abstract

Background: One of the most important elements that improve a healthy life-style is Physical Activity (PA), it's a health-enhancing behavior. It helps in many aspects, such as; weight loss, prevent cardiovascular disorders, control of Type II diabetes, psychological well-being and muscle and bone development. Moreover, PA improves health state and Quality of Life (QoL).

Objectives: To explore the association between PA levels and QoL among Saudi female students at Princess Nourah Bint Abdulrahman University (PNU) in Riyadh city.

Methodology: A cross-sectional study was conducted among 400 Saudi female students aged between 18 – 30 years old. Exclusion criteria were having a health condition that can be hindering the PA, or physical disability. The PA of participants was assessed using the validated Arabic short version of the International Physical Activity Questionnaire (IPAQ), and the validated Arabic Short Form 36 (SF-36) questionnaire was used to assess the QoL for each participant.

Results: Most of the participants had low PA level (45.25%), while 39.75% had moderate PA level, and the lowest percentage was in those who had high PA level (15%). Participants' scores of QoL were significantly higher among those with high grades of physical exercise regarding physical functioning domain ($p<0.05$), and their QoL scores didn't differ significantly according to their grades of physical exercise regarding the role of limitations due to physical health, the role of limitations due to emotional problems, energy/fatigue, emotional well-being, social functioning, pain and general health domains.

Conclusion: Most of the Saudi female students at PNU had low PA levels. Their quality of life is significantly associated with their physical activity levels. To encourage healthy living and minimize inactivity among the students, using the existing facilities and resources of the university such as fitness and health centers would be cost-effective and convenient.

Keywords: Physical activity, Quality of life, Saudi female

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Introduction

According to the World Health Organization (WHO), Health is central to human happiness and progress, it relates to physical, mental and social well-being, not only the absence of disease or infirmity. This contributes significantly to economic growth, as healthier people live longer, become more productive and save more [1].

One of the most important elements that improve a healthy life-style is Physical Activity (PA), it's a health-enhancing behavior. PA is defined as any bodily movement produced by contraction of skeletal muscle that results in a substantial increase in caloric requirements over resting energy expenditure. It

helps in many aspects, such as; weight loss, prevent cardiovascular disorders, control of Type II diabetes, psychological well-being and muscle and bone development. Further, children and adults gaining regular physical activity habits contribute to mental health, quality of sleep, obesity risk, stress and depression reduction [2,3].

Previous studies showed that PA enhances Quality of life (QoL) through the variables of exercise self-efficacy, physical self-worth, and affect. There is a positive relationship between physical activity and quality of life. WHO defines QoL as" a broad-ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment [4].

In Saudi Arabia, 58.5% of adults were considered physically inactive. A systematic review reported the presence of high inactivity prevalence among the Saudi population. Compared to males, Saudi females have less access to exercising facilities and limited opportunities to engage in physical activity [5].

According to the 2030 vision there are twelve Vision Realization Programs in order to achieve the objectives established in Vision 2030 defined by the council of economic affairs and development. Among those twelve Programs is the Quality-of-Life Program 2020. This program is aimed to focus on two aspects: first, improving lifestyle, developing an ecosystem to support and create new options that reinforce citizens' and residents' participation in cultural, entertainment, and sports activities. Second, enhancing the quality of life, developing suitable activities that contribute to enhancing the quality of life of individuals and families, creating jobs, diversifying economic activity, and boosting the status of Saudi Arabian cities so that they categorize as the best cities in the world [6].

Princess Norah Bint Abdulrahman University (PNU) makes every effort trying to achieve the Kingdom's vision by planning many physical activities to improve overall health and wellbeing. Therefore, this study will focus on female health among students at PNU. The study hypothesis is that PA may have a positive relationship with QoL, indicating that the more PA level the students have, the better QoL. However, there are lots of barriers that hinder them from engaging in any physical activity program. Thus, the aim of this study is to explore the association between PA levels and QoL among Saudi female students at PNU.

Literature Review

Physical activity

Physical Activity (PA) has a positive impact on our life. It could prevent or manage some diseases and minimize health threats to be encounter in the future. PA plays an important role in muscle and bone development, weight reduction and controlling type II diabetes, cardiovascular disorders, as well as in psychological well-being such as depression, anxiety and reduces the risk of death. Moreover, the adverse health consequences associated with being physically inactive are common and include the increased risk of different types of diseases such as breast cancers, colon cancers, stroke, and hypertension. Physical inactivity considered as the fourth leading risk factor for global mortality.

Physical activity can be classified into three levels; high, moderate and low. Many factors could affect the level of physical activity of an individual, such as age, where the physical activity of elderly people differs from younger adults or children. Another factor is the health status, healthy people differ from unhealthy people. In addition to the lifestyle of the person, whether he is working or not could affect the level of physical activity. It has been reported that athlete's people have a lower possibility of having depression compared to nonathletic people [7].

On the other hand, there are some barriers that affect the level of physical activity such as watching TV, spending a lot of time with smartphones, playing computer games, lack of time, and lack of knowledge about the impact of being physically inactive. Sedentary lifestyles can lead to various negative health problems. At the end, PA is clearly positive with emotional, social and perhaps spiritual connotations and lots of fun. Recess is a PA for QoL. People should involve more PA programs in their lives [8,9].

Quality of life

According to the World Health Organization (WHO), Quality of life (QoL) is defined as an individuals' perception of their position in life in the context of the culture and value systems in which they live and their relation to their goals, expectations, standards, and concerns. It measures personal health status, which is affected by culture and environment. Quality of life and specific Health-Related Quality of Life (HRQoL) assessment is becoming a fundamental component of public health surveillance. Health-related

quality of life assessment is especially relevant to a group with long-term or chronic health conditions and/ or disability. It can be defined as the level of physical, psychological and social wellbeing which may impact have on the health status of the person. It can also be defined as is a subset of QoL and used for measuring the interaction between health and indicators of wellbeing [10].

Studies have shown that there is a decrease in the QoL in the form of sleep difficulties, fatigue, anxiety, and depression. Therefore, the decline in QoL has an impact on physical and physiological disorders. The study stated that an increase in the score of the learning environment would improve the QoL by 13%.

QoL alters the perception of physical, psychological and social well-being, as well as affects work performance, which could influence performance and HRQoL. Women have a lower HRQoL than men. Also, non-smokers had a higher HRQoL compared to smokers. Studies have also shown that overweight/obesity is associated with decreasing levels of HRQoL [11].

Finally, Knowledge of the psychosocial factors that affect the health and well-being of a person allows developing strategies that reduce stress and tension. The present quality of life of an individual is influenced not only by current positive and negative well-being but hope and fears concerning future perspectives as well. An individual's worries may concern different themes and different domains [12].

Relationship between physical activity and quality of life

Many recent studies have focused on the relationship between PA and QoL. Some of the published studies have investigated the relationship between PA and satisfaction with life among healthy, young adults and college students. Studies suggest that QoL is a multidimensional construct and can be classified into health, psychological, social and environmental domains that address physical state, social functioning and emotional well-being, one important area of quality of life is a physical activity [13].

According to Güner Çiçek (2018), PA improves health state and QoL, through health promotion, psychological well-being, relationship development, increased optimism and participation in meaningful life activities.

A study on 727 individuals aimed to examine the relationship between physical activity levels and life quality of Amasya University students, a strong relationship between the activity levels and quality of life of individuals with average and higher levels of physical activity, because of its beneficial effects. PA increases the QoL in healthy people and patients with chronic conditions such as cardiovascular disease, chronic respiratory failure, diabetes, and cancer [14].

Thus, an inactive lifestyle often associated with the prevalence of psychosomatic and motor function disorders as well as with impaired social performance. It can cause an increased risk of development of secondary health problems such as metabolic dysfunction, cardiovascular disease, low- bone density in the long term. According to some studies that physically active individuals' quality of life domains higher than their physically inactive counterparts. It has been reported to improve the quality of life for 156 Malaysian children aged 9-11 years as a result of regular physical activity. Also, loss of weight to overweight and obese children aged 8-12 years as a result of engagement in regular physical activities [15].

Physical activity, at least 20 to 30 minutes of moderate-intensity exercise and walking on most days of the week, help in prevent chronic diseases and improve health state. Study have found these recommendations improved the quality of life in people with chronic diseases. It may affect the quality of life through two major elements: physical functioning and wellbeing [16].

Finally, one of the most important elements to improve a healthy lifestyle is physical activity, because of its benefits in all aspects of life such as psychological, social and physical. Therefore, it must be ascertained that physical activity is an essential part of daily life. For a healthy social structure. Given its importance in terms of improving individual health and reducing health threats to be encountered in the future.

Physical activity and quality of life in Saudi Arabia (vision 2030)

A systemic review reported the presence of high inactivity prevalence among the Saudi population. According to a national survey, 60% of the entire Saudi Arabian population is physically inactive. Physical inactivity, sedentary behaviors, and consumption of high caloric diet, has increased and became common among Saudi society, this has contributed positively effect on the quality of life, which is increase in lifestyle-related non-communicable diseases in the country, includes, obesity, diabetes mellitus,

cardiovascular diseases, and hypertension.

Many environmental barriers related to urbanization are believed to be attributed to such global inactivity epidemic, including fear of unsafe outdoor places, traffic, low quality of weather, lack of sport skills, lack of motivation, lack of self-confidence, lack of social support, lack of resources, and the most commonly reported barrier to physical activity is the lack of time in both males and females. Family income may also influence physical inactivity, compared to the high-income people low-income people are less likely to meet PA guidelines.

According to the Quality-of-Life Program 2020 there are twelve Vision Realization Programs in order to achieve the objectives established in Vision 2030 defined by The Council of Economic Affairs and Development. Among those twelve Programs is the Quality-of-Life Program 2020. This program Aspire through it on making Saudi Arabia a top living destination for both Saudi citizens and residents. This Program will focus on two aspects: first, improving lifestyle, developing an ecosystem to support and create new options that reinforce citizens' and residents' participation in cultural, entertainment, and sports activities. Second, enhancing the quality of life, developing suitable activities that contribute to enhancing the quality of life of individuals and families, and boosting the status of Saudi Arabian cities so that they categorize as the best cities in the world.

At the end, health-care providers have definitely a significant role to play in boosting physical activity, by providing instructions and counseling on increasing physical activity, improving fitness and reducing sedentary behaviors for their patients. Health-care providers can encourage their patients and communities by making physical activity a vital sign and designing active health-care environments.

Aim of the study

The aim of this study is to explore the association between PA levels and QoL among Saudi female students at PNU in Riyadh city.

Objectives

1. To assess the PA level of Saudi female students at PNU

2. To assess the QoL of Saudi female students at PNU

3. To examine the association between PA levels and QoL

Hypothesis

The study hypothesis is that PA may have a positive relationship to QoL, indicating that the more PA the students have, the better QoL.

Societal relevance

Most of the Saudi population is physically inactive, especially Saudi females due to many barriers that render them engage in any physical activity program. Due to this, identifying the levels of PA and QoL among Saudi female students at PNU is important to encourage students to get the benefit of different PA activities organized at PNU premises to improve their QoL and wellbeing.

Expected outcomes

There is a strong relationship between PA levels and QoL. It is expected that a high percentage of students could possibly have low PA level which linked to lower QoL.

Materials & Methods

Research design

A cross-sectional study will be carried out among the students at Princess Nourah bint Abdulrahman University (PNU).

Research setting

The research will be conducted at PNU in Riyadh city.

Study population

The study will be conducted among Saudi female students at PNU in Riyadh.

Inclusion criteria

Being a Saudi female student aged between 18-30 years old in one of the faculties at PNU.

Exclusion criteria

1. None Saudi students.
2. Having a health condition that can be hindering the PA or Physical disability.
3. Faculty and administrative staff at PNU.

Sampling method

The study will use a convenient sampling method.

Sample Size

The following sample size equation was used to calculate the study sample size from PNU population= 52308, (> 10000).

$$n = \frac{z^2\, pq}{d^2}$$

n=Sample size.
Z= z score will be 1.96 since its constant value for 95% confidence interval.
P= prevalence of factor under study and it is supposed to be 50%
q= 1- p = 1-0.5 = 0.5
d= designed margin of error will be (0.05)

According to n4Studies application the recommended sample will be (400).

Research instrument

The participants will be asked to complete a self-reported questionnaire that consists of three sections.

Socio-demographic section will collect the social demographic characteristics of the respondents which consist of age, marital status, monthly income, history of any medical condition, smoking, faculty name and the year of education.

Assessment PA level section questions in this section derived from the International Physical Activity Questionnaire in Geneva (IPAQ) (1998). After the IPAQ questionnaire developed, extensive reliability and validity testing were undertaken across 12 countries during 2004 and 2019.

The questionnaire measures the level of physical activity in the last seven days and finds out about the kinds of physical activities that people do as part of their everyday lives.

A total of 7 questions will be provided for this section as follow:

1. During the last 7 days, how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?
2. How much time did you usually spend doing vigorous physical activities on one of those days?
3. During the last 7 days, how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking?
4. How much time did you usually spend doing moderate physical activities on one of those days?
5. During the last 7 days, how many days did you walk for at least 10 minutes at a time?
6. How much time did you usually spend walking on one of those days?
7. During the last 7 days, how much time did you spend sitting on a weekday?

Scoring the PA level

Results can be reported in categories (low activity levels, moderate activity levels or high activity levels) or as a continuous variable (MET minutes a week). A MET is a multiple of your estimated resting energy expenditure.

Will consider walking to be 3.3 METS, moderate physical activity to be 4 METS and vigorous physical activity to be 8 METS.

To calculate MET minutes/week multiply the MET value given by the minutes the activity was carried out and again by the number of days that activity was undertaken.

1. Scoring a HIGH level of physical activity on the IPAQ means that they achieving:

1. Vigorous-intensity activity: ≥ 1500 MET minutes a week
2. Any combination of walking, moderate-intensity or vigorous-intensity activities: ≥3000 MET minutes a week.

2. Scoring a moderate level of physical activity on the IPAQ means that they achieving:

1. Vigorous-intensity activity: 480 - 1499 MET/week.
2. Moderate intensity activity: ≥ 600 MET/week.
3. Walking: ≥ 495 MET/week.
4. Any combination of walking, moderate-intensity or vigorous-intensity activities: 600-2999 MET minutes a week.

3. Scoring a LOW level of physical activity on the IPAQ means that you are not meeting any of the criteria for either MODERATE of HIGH levels of physical activity.

Assessment QoL section

A Short Form 36 (SF-36) questionnaire Arabic version will be used to assess the QoL for each participant. The Medical Outcomes Study SF-36 questionnaire is a well-validated scale that measures health-related QoL in the following domains: physical functioning, role limitations due to physical health, role limitations due to emotional problems, energy/ fatigue; emotional well-being, social functioning, pain, and general health. The SF-36 has been translated into a number of languages and is a reliable and valid general health survey across different cultures or nations [17].

The quality-of-life assessment of each respondent will take place by scoring the number of correct questions over a total number of 36 questions.

1. Examples of the questions to be included as follows:
2. Emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?
3. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?
4. How much bodily pain have you had during the past 4 weeks?
5. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

Scoring the QoL level

Item numbers	Change original response category*	To recode value of:
1,2,20,22,34,36	1 →	100
	2 →	75
	3 →	50
	4 →	25
	5 →	0

	1 →	0
	2 →	50
3,4,5,6,7,8,9,10,11,12	3 →	100
	1 →	0
13,14,15,16,17,18,19	2 →	100
	1 →	100
	2 →	80
	3 →	60
	4 →	40
	5 →	20
21,23,26,27,30	6 →	0
	1 →	0
	2 →	20
	3 →	40
	4 →	60
	5 →	80
24,25,28,29,31	6 →	100
	1 →	0
	2 →	25
	3 →	50
	4 →	75
32,33,35	5 →	100

Table 1: Recoding items.

Scoring the 36-Item Health Survey is a two-step process. First, numeric values are recoded per the scoring key given in **Table 1**.

Scale	Number of items	After recoding from Table 1, average the following items
Physical functioning	10	3,4,5,6,7,8,9,10,11,12
Role limitations due to physical health	4	13,14,15,16
Role limitations due to emotional problems	3	17,18,19
Energy/fatigue	4	23,27,29,31
Emotional well-being	5	24,25,26,28,30
Social functioning	2	20,32
Pain	2	21,22
General health	5	1,33,34,35,36

Table 2: Averaging items to form scales.

Note that all items are scored so that a high score defines a more favorable health state. In addition, each item is scored on a 0 to 100 range so that the lowest and highest possible scores are 0 and 100, respectively. Scores represent the percentage of the total possible score achieved. In step 2, items on the same scale are averaged together to create the 8 scale scores. The items averaged together to create each scale. Items that are left blank (missing data) are not taken into account when calculating the scale scores in **Table 2**.

Hence, scale scores represent the average for all items in the scale that the respondent answered [18].

Statistical Analysis

All data will be compiled and statistically analyzed using the Statistical Analysis Program for the Social Sciences (SAPSS). Incomplete data will be removed before analyzing the data. The descriptive statistic will be presented as mean ± SD for continuous data or frequency and percent (%) for categorical data. ANOVA test will be applied to compare means between different groups based on the level of physical activity and different domains of QoL. Significant result will be considered as a cut-off p-value < 0.05.

Ethical Consideration

The study will be accomplished after obtaining ethical approval from the Institutional Review Board committee of PNU. Before the study, all subjects will be provided with a consent form about the purpose of the study and their role in the study. The participation will be voluntary, and the subjects have the option to refuse to take part in the study. There will be no physical or psychological risks by being in this study. The information obtained from this study will help to identify the impact of physical activity on quality of life among PNU female students. The information that identifies the participants' names, telephone numbers, etc. will not be taken.

Results

Socio-demographic characteristics

Socio-demographic characteristics	No.	%
Age (years):		
≤ 20	201	50.3
> 20	199	50
Material status:		
Single	378	94.5
Married	20	5
Divorce	2	0.5
Income (SR):		
Less than 3000	46	11.5
3000-5000	61	15.3
5000-10000	58	14.5
10000-15000	115	28.7
More than 15000	120	30
Medical condition:		
Yes	40	10
No	360	90
If yes, specify		
Anemia	13	3.4
Asthma	15	3.9
DM	2	0.5
Hypertension	1	0.3
Hypothyroid	1	0.3
IBS	1	0.3
Inflammation of the kidneys, gallbladder	1	0.3
Others	11	2.9
Smoking status:		
Yes	15	3.8

No	385	96.3
Name of faculty:		
Colleges of Humanities	144	36.1
Colleges of Sciences	99	24.8
Colleges of health science	141	35.4
Colleges of Community	16	4
Education level(years):		
1	90	22.6
2	112	28.1
3	84	21.1
4	114	28.5

A total of 400 Saudi female students from PNU participated in the study. It summarizes the socio-demographic characteristics of participants in **Table 3**.

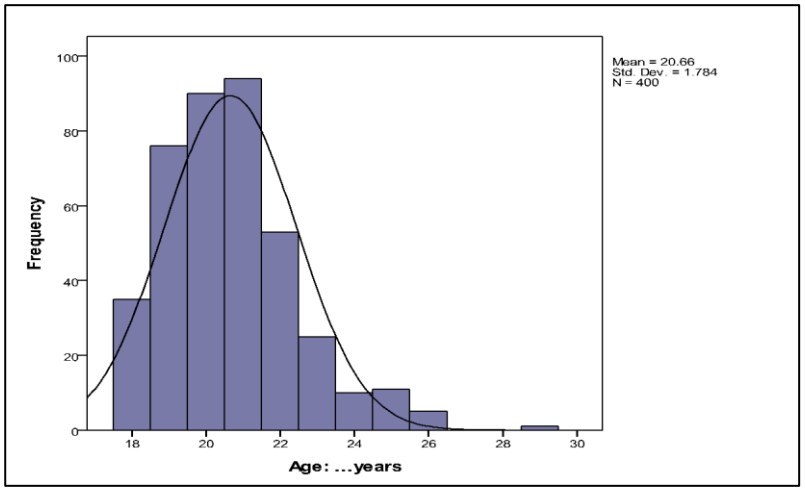

Figure 1: Age distribution of participants.

The mean age was 21 ± 1.8 years with a range of years old as shown in (**Figure 1**).

The majority of participants were single (94.5%) and about 59% with family monthly income more than 10000 SR. 90% of participants have no medical condition, and about 96.3% were non-smokers. In addition, 36.1% of participants were from Colleges of Humanities and only 4% from a college of communities. The education level of the participants was as follows; 28.5% in the 4th year of study, 28.1% the 2nd year, 22.6% in the 1st year and the remaining were in their 3rd year of studying (21.1%) [18-29].

Physical activity levels

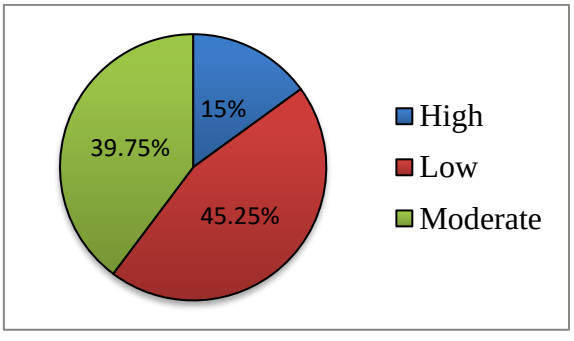

Figure 2: Participants' levels of Physical Activity (PA).

It shows that most of the participants had low PA level (45.25%), while 39.75% of the participants had moderate PA level, and 15% had high PA level in (**Figure 2**).

Quality of life

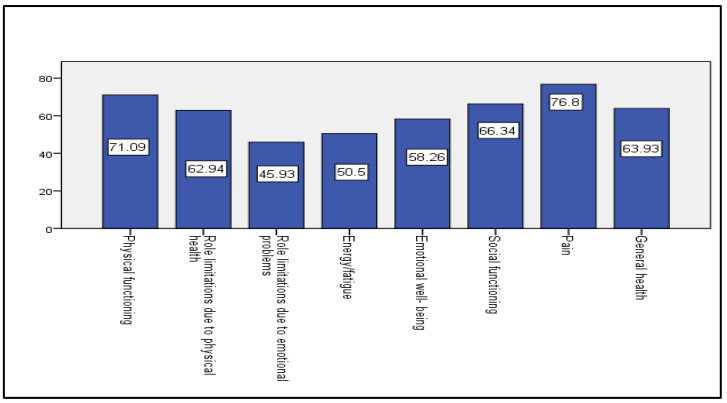

Figure 3: Mean score of each of the domains of the "SF-36 Survey".

According to figure (3), the highest mean score for participants' QoL were those of the "pain domain" (76.8), while the least were those for "role limitations due to emotional problems domain" (45.93). The mean scores of participants' QoL in different domains was as follows: physical functioning 71.8, role limitations due to physical health 62.94, energy/fatigue domain 50.5, emotional well-being 58.26, social functioning 66.34 and for general health it was 63.93.

Physical activity and quality of life

Domains of quality of life	Levels of physical activity						P-value
	Low		Moderate		High		
	Mean	SD	Mean	SD	Mean	SD	
Physical functioning	67.5	28.4	73.4	26.5	75.8	27.6	49
Role limitations due to physical health	60.8	38.5	65.3	37.3	63.3	34	543
Role limitations due to emotional problems	46.6	41	45.1	40.8	46.1	38.9	943
Energy/Fatigue	49.7	17.9	50.1	19.4	54	17.4	274
Emotional well-being	57.6	18.6	57.4	19.2	62.5	17.5	160
Social functioning	68.2	22.3	64.3	24.4	66.1	22.3	314
Pain	78.3	20.9	77.1	21.8	71.5	20.5	94
General health	62.5	14.5	64.8	15.3	66	14.8	171

Table 4: Participants' quality of life scores (Mean ± SD) according to their physical activity levels.

The participants' scores of quality of life were significantly higher among those with high grades of physical exercise regarding physical functioning domain ($p<0.05$), however, their QoL scores didn't differ significantly according to their grades of physical exercise regarding the role of limitations due to physical health, the role of limitations due to emotional problems, energy/fatigue, emotional well-being, social functioning, pain and general health domains in **Table 4**.

Discussion

This study aimed to explore the association between PA levels and QoL among 400 Saudi female students at PNU in Riyadh city. The Physical Activity (PA) of participants was assessed using the validated Arabic short version of the International Physical Activity Questionnaire (IPAQ), and the validated Arabic Short Form 36 (SF-36) questionnaire was used to assess the Quality of Life (QoL) for each participant.

Some of the factors affecting this study results are age, monthly income, medical condition, smoking and faculty name. This study found that half of the participants aged 21 ± 1.8 years. It has been reported that

total daily activity declines with age in older adults. The present study showed that 59% of the participants had monthly income more than 10000 SR. An individual's socioeconomic status has a direct impact on their quality of life and health. as those with exposure to scarce resources are unable to take care of their wellbeing, their quality of life is further decreased. 90% of participants had no medical condition, but we found that 10% of the participants have a medical condition, such as anemia, asthma, diabetes mellitus, hypertension, hypothyroid, irritable bowel syndrome, inflammation of the kidneys, gallbladder and other medical condition which include (allergy, sinuses). As well as most of the students were non-smokers (96.3%). The previous study showed that PA enhances the respiratory system while smoking addiction interferes with breathing functions, therefore, the PA levels decrease. Data were collected from different four colleges in PNU, the least participants were in college of communities (4%), the main reason for this is that only one specialty is available in this college, therefore, it includes fewer students compared to other colleges which include more specialties and more students [19-21].

One of the most important elements that improve a healthy life-style is PA, which is a health-enhancing behavior. PA helps in many aspects, such as; weight loss, prevent cardiovascular disorders, control of Type II diabetes, psychological well-being, muscle and bone development. PA can be classified into three levels; high, moderate and low. This study demonstrates that most participants had low PA level (45.25%), which is in agreement with the study done in Saudi Arabia. AL-HAZZAA et al. reported that the high prevalence of sedentary behaviors and the low level of PA, especially among females in three major cities in Saudi Arabia (Al Riyadh -Jeddah-Al Khobar). Results from a systematic review showed that the prevalence of physical inactivity ranged from 43% to 91% among Saudi females. Moshibah et al. (2015) showed that more than half of Saudi adults were physically inactive. A study of college students in Al Kuwait reported a prevalence of physical inactivity of 55% among females. In Jordan, Bawdi et al. reported that half of the participants were not physically active. According to the World Health Organization (WHO), PA is considered the fourth leading risk factor for global mortality remove. The low PA in Saudi females could be attributed mainly to social and cultural reasons, as females have generally limited opportunities when compared to males, to engage in PA, especially outdoor activity. Besides the hot weather, they prefer to use transportations rather than walking. Furthermore, females also reported more barriers than males with a lack of time, lack of social support, lack of motivation, low self-efficacy, lack of facility, and resources [22-26].

Quality of life is a broad-ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment". This study assessed eight domains in quality of life which include (physical functioning, role limitations due to physical health, role limitations due to emotional problems, energy/fatigue, emotional well-being, social functioning, pain and general health). The results in present study indicated that the highest mean score was in the pain domain (76.8), and the least mean score was in role limitations due to emotional problems domain (45.93). Our research results are comparable to the research results examined by Gürol et al. The above-mentioned results are more likely that the physical health domain showed a higher mean score than the mental health domain [27-29].

Saudi Arabia Vision 2030, emphasized on Improving individuals' lifestyle and enhancing the quality of life, thus, Princess Norah Bint Abdulrahman University (PNU) makes every effort trying to achieve the Kingdom vision. According to the results in the present study, PA was significantly associated with the physical functioning domain in QoL scales. In accordance with the results of this study, the previous study done in Saudi Arabia reported positive relations between physical activity and the physical functioning domain in QoL. This domain tends to be more related to the physiological functional aspects rather than the psychological. Moreover, it indicates that low PA levels could cause a reduction in the physical functions, which would have a direct negative impact on the musculoskeletal system that are related to functional ability and the risk of chronic diseases. PA can also prevent musculoskeletal disorders, such as low back pain, osteoporosis, and associated fractures. This study reported the PA levels were non-significant with all domains of QoL except for the physical functioning domain. Other variables can also affect the association between PA and QoL: in addition to the levels of PA, self-efficacy can also influence health perception, fitness, and vitality of individuals [30].

Limitation

This study used validated and commonly used questionnaires, the sample size is considered appropriate according to the number of female students, calculated by the complex mathematical formula available to calculate an adequate sample size(n=400). To the best of our knowledge, our study is the first to investigate the relation between QoL and PA among Saudi female students at PNU in Riyadh city.

This research is a cross-sectional study, as such causal inferences about the relationship between PA and QoL cannot be determined. Our sample includes females aged from (18-29), one university and limited time to conduct our research could be consider some of the limitation in our opinion. Therefore, the results cannot be generalized.

Conclusion

This study concluded that almost half of Saudi female students at PNU had low PA levels, the participants' scores of QoL were significantly higher among those with high grades of physical exercise regarding the physical functioning domain.

Recommendation

University years are an important time for personal development and are ideal environments for implementing health education and health management programs. Using the existing facilities and resources of the university such as fitness and health centers would be cost-effective and convenient for many female students. Encourage healthy living and minimize inactivity among the students, by organizing more campaigns by the university to increase awareness among the students, also, design classroom for students in each faculty to spend their free time to practice physical activities. Establish and eliminate barriers of PA are needed.

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