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## HEALTH PSYCHOLOGY | RESEARCH ARTICLE

# The mediating role of exercise behaviour on satisfaction with life, mental well-being and BMI among university employees

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**Abstract:** *Background:* Health is one of our greatest assets, yet we often neglect our physical health. According to the WHO, the obesity epidemic is of global concern. This article aimed to understand how a physically active lifestyle could lead to higher levels of mental well-being and life satisfaction. *Objectives:* The purpose of this study was to assess the life satisfaction, mental well-being and body mass index (BMI) of employees at Sultan Qaboos University (SQU). *Methods:* A group of 320 SQU employees (176 males and 144 females) with a mean age of  $46.14 \pm 9.32$  years participated in this study. The Satisfaction with Life Scale (SWLS) and the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS) were used to measure life satisfaction and mental well-being. Additionally, BMI and exercise behaviour, which was based on weekly participation in a number of intentional sports activities and exercise, were measured. *Results:* The study revealed that participants who were more physically active, compared to those who were less active, experienced higher levels of mental well-being and were generally more satisfied with their lives. The findings also indicated

### ABOUT THE AUTHORS

Kashef N. Zayed obtained his PhD from the University of Bucharest, Romania in 1996. Currently, he is working as an associate professor at the Sultan Qaboos University, Sultanate of Oman. His main task is to teach Sport Psychology and Motor Learning, directs the undergraduate and graduate programs, conduct research in these fields and supervise sport sciences MA's students. His international experience includes serving as a visiting professor at Regensburg University, Germany and previously at the University of Jordan. He has authored or coauthored research papers in many internationally reputed journals in the field of Exercise and Sport Psychology and other related areas, and also his work has been cited in many research and reports. Additionally, Dr Kashef has participated in many international and regional conferences. He has international professional affiliation with the American Psychological Association (APA) and the International Society of Sport Psychology (ISSP). His research and scholarship seeks to understand the lifestyle & psychological well-being and on Exercise motives & attitudes.

### PUBLIC INTEREST STATEMENT

According to the WHO, the increasing epidemic obesity has becoming a global concern. Health is one of our greatest assets, yet we often neglect our physical health. Global research has led to the recognition of the benefits of exercise behaviour; this article aimed to understand how a physically active lifestyle could lead to higher levels of mental well-being and life satisfaction. It adds to the body of knowledge showing the role of exercise behaviour in health and the role it plays in the psychological health benefits of physical exercise. Even though this study was conducted at a particular university, it provides evidence that allows policy-makers and academics at universities to make decisions about health care development and the value of maintaining a physically active lifestyle, which could result in reduced costs of medical care and increased productivity. The results from this study provide insight and motivation for university employees to participate in and increase daily exercise to gain the psychological and physical benefits of physical exercise.

that participants with a healthy body mass index (BMI = 20–25) enjoyed higher levels of life satisfaction than those classified as overweight or obese (BMI > 25). Finally, the study showed no significant differences between the gender and age groups.

**Conclusions:** This study concluded that a physically active lifestyle can lead to higher levels of mental well-being and can improve life satisfaction. A healthy BMI may play a considerable role in increasing the levels of life satisfaction in adults.

**Subjects:** Mental Health; Health Psychology; Psychological Methods & Statistics; Medical Sociology

**Keywords:** exercise; physical activity; well-being; life satisfaction; BMI

### 1. Introduction

According to the WHO, Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 2017). However, it has been found that the pandemic obesity and its associated problem spreading worldwide, equally in developing and developed countries, is associated with the deaths of 1.9 billion adults each year as a result of being overweight or obese (WHO, 2016). Organization such as the WHO, UNESCO and other health-related bodies endeavour to find a strategy to deal effectively with obesity. As obesity is not only a health issue, it is also becoming a pressuring economic burden to many nations. A number of studies on the relationship between physical exercises and mental health have emerged in recent years, indicating that physical exercise (as opposed to sedentary behaviour) plays a positive role in the prevention and treatment of various medical conditions. However, the study of sedentary behaviour as a distinct concept from exercise behaviour has recently been advocated (Owen, Leslie, Salmon, & Fotheringham, 2000). Sedentary behaviour is defined as time spent not exercising or doing activities that require very low energy expenditure with sitting or lying is the dominant posture. Sedentary behaviour is an important risk factor to the physical, physiological, psychological and emotional health among youth and adults (Pate, O'Neill, & Lobelo, 2008). This means that even highly active individuals are susceptible to the negative health effects of time spent being sedentary. Sedentary behaviour is therefore a complex factor which is vague in its conceptual and definitional understanding, while regular exercise has a positive influence on the quality of life. Exercise contributes to managing feelings of tension, anxiety (Taylor, 2000) and anger, increases mental well-being (Gorman, 2014) and improves physical, mental and cognitive functioning across one's lifespan (Singer, Hausenblas, & Janelle, 2001) as well as self-esteem (Ahmed, 2013, 2014; Ahmed et al., 2017; Fox, 2000). Brodání, Spisiak, and Paska (2015) have found that people who engage in regular physical exercise at least three times per week are more satisfied with their lives than individuals who do not engage in any physical activity. Physical activity strengthens the association with life satisfaction and mental well-being.

Satisfaction refers to a judging process in which people assess the quality of their lives on the basis of their own unique set of criteria (Shin & Johnson, 1978). It is a key concept in positive psychology and is associated with the fulfilment of basic needs and the achievement of life objectives. Martín-Albo, Núñez, Domínguez, León, and Tomás (2012) conducted a gender-based study on 293 participants between 18–70 years of age who did a variety of physical exercises. The study aimed to investigate the interrelationship among intrinsic motivation, physical self-concept and satisfaction with life. The study reported a higher level of satisfaction with life and a better physical self-perception among people who engaged in regular physical exercise. A study on health states and health differences among sporting and non-sporting individuals, Fialová (2004) provides evidence that physical activity is a strong mediator for amelioration of one's body and satisfaction with life.

Well-being reflects an individual's self-assessment of life in its current state and directly affects the degree of satisfaction with the individual's life as a whole (Seligman, 2002) Research has shown that health and well-being are inseparable constructs, providing many benefits to employees and

employers through improved productivity and absenteeism rates (Aldana, 2001; Anderson, Serxner, & Gold, 2001). Mental well-being is a state of health in which an individual is potentiality well realized, can cope with the day-to-day life stresses and work productively for the development of his community. Black, Cooper, and Martin (2015) investigated leisure time physical activity, walking and physical activity under free-living conditions for pleasure to determine its association with mental well-being in adult people. Total levels of free-living physical activity did not show a positive association between leisure time physical activity and walking with mental well-being (Ahmed, Ho, & Lee, 2016)

University employees are confronted by a number of deadlines and challenges central to the development of the university (Akinyokun & Uzoka, 2007; Considine, 2001; Langford, 2010; Tien, 2007; Williams & Dyke, 2008; Wodarski, 2001). In their busy schedules, the employees often forget or ignore participation in physical activity or leisure activities. People are often engaged in substantial sedentary activities during their office time. The University is a place where employees usually belong to different age categories (from “those who have recently joined as employees” to “those who are close to retirement”). Thus, health issues in this context are equally important factors for employees working at the university, regardless of their age groups. Maintaining a healthy lifestyle with regular physical activity over various age groups is of major concern. People between the ages of 18 and 25 years are of specific importance. As these individuals emerge into adulthood, their participation in physical activity declines more significantly than during any other time in the adult life span. Additionally, according to the WHO, older adults aged 65 and over are the fastest growing segment of the World’s population and is likely to double by 2050 (National Institute on Aging, 2015). Thus, the increase in sedentary activities and its impact on the health of people have to be explored across countries.

Only a few studies investigated the relationship between Satisfaction with Life, Mental well-being and physical activity (Bae, Suh, Ryu, & Heo, 2017). However, no studies could be found that attempted to study a cohort from a particular university investigating exercise behaviour intensity levels (i.e. vigorous, moderate and light) and its relationship to satisfaction with life, mental well-being and BMI. Therefore, the overarching aim of this study is to provide data from the Sultan Qaboos University, investigating a gender-based comparison and determine the relationship between satisfaction with life, mental well-being and body mass index among these employees. It was hypothesized that there would be significant differences in satisfaction with life, mental well-being and BMI between employees (male and female) who exercise and those who do not. Additionally, it was hypothesized that employees who engage in vigorous exercise would experience higher levels of well-being and life satisfaction, and have a normal BMI, compared to employees that engage in only moderate, mild or no exercise. Vigorous exercise includes activities that requires a large amount of effort and causes rapid breathing and substantial increase in heart rate (WHO, 2017). Regular physical activity across all age categories promotes active lifestyles (WHO, 2014) and are considered to be important health-promoting behaviour (Lindwall, Rennemark, & Berggren, 2008). Adult people who participate in at least 1 h and 15 min vigorous intensity (i.e. hiking, basketball, high-intensity aerobics, fast swimming, cycling) level physical activity (WHO, 2014) weekly experienced an improved sense of well-being and satisfaction (Brown & Kasser, 2002).

## 2. Methodology

### 2.1. Participants

A cross-sectional design, using simple random sampling techniques, was employed in this study. This design was chosen for the current study as researchers recorded information about the participants without any manipulation of the study environment. Three hundred and twenty SQU’s employees with a mean age of  $46.14 \pm 9.32$  years participated in this study. One hundred and seventy-six (55%) employees were male and one forty-four (45%) employees were female. Further, only permanent employees were included, while short-term/visiting faculty/employees were excluded from the study.

## 2.2. Demographic information

While 221 (69.1%) employees were citizens of Oman, 99 (30.9%) were from other countries. The sample included Administrative ( $n = 110$ , 34.4%), Academic ( $n = 92$ , 28.6%) and Technical ( $n = 118$ , 36.9%) personnel. When categorized according to BMI, participants were underweight ( $n = 30$ , 9.4%), over weight ( $n = 113$ , 35.3%) or obese ( $n = 63$ , 19.7%), and just more than a third of the sample had a normal weight ( $n = 114$ , 35.6%). The participants participated in vigorous exercise ( $n = 87$ , 27.2%), moderate exercise ( $n = 62$ , 19.4%), mild exercise ( $n = 96$ , 30%) or no exercise ( $n = 75$ , 23.4%).

## 2.3. Measures

*Satisfaction with Life* was assessed with the Satisfaction with Life Scale (SWLS) developed by Diener, Emmons, Larsen, and Griffin (1985). This scale is composed of five statements (e.g. “so far, I have gotten the important things I want in life”) measuring global life satisfaction on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Cronbach’s alpha for the sample of this study was high for SWLS ( $\alpha = .84$ ). The sum of all the items in the scale was used as the satisfaction with life score and for data analyses.

*Mental well-being* was assessed with the Warwick–Edinburgh Mental Well-Being Scale (Tennant et al., 2007). The scale assesses positive mental health (mental well-being) and consists of 14 positively worded items (e.g. “I’ve been interested in new things”) with five response categories (0 = none of the time, 1 = rarely, 2 = some of the time, 3 = often, 4 = all of the time). Cronbach’s alpha for the sample of this study was high ( $\alpha = .91$ ). The questionnaire is one-dimensional and therefore, the sum of all the items was used as the mental well-being score and for data analyses.

*Body Mass Index (BMI)*: The BMI of the participants was calculated using the following formula:  $BMI = \text{mass kg/height m}^2$ . The participants were then classified into one of four groups according to their BMI: an underweight group ( $BMI < 18.5$ ), a normal weight group ( $BMI = 20\text{--}25$ ), an overweight group ( $BMI = 25\text{--}30$ ) and an obese group ( $BMI > 30$ ).

*Lifestyle physical activity*: The exercise behaviour of participants was assessed through self-reporting, in which participants were asked to identify their exercise and/or sport behaviour over the last two weeks. The scale consists of three questions. The first question aims to determine exercise behaviour during leisure time (such as football, basketball, handball, swimming, running, riding a bike or walking or aerobic exercise training, etc.). The second question relates to the frequency of exercise during weekly practice sports (how many times they exercised weekly), whereas the third question assesses the amount of time spent in each exercise session. The total amount of time spent exercising per week was calculated for each participant. Accordingly, participants were categorized into one of four groups, namely, inactive lifestyle (no exercise or sport at all), mildly active lifestyle (exercising or playing sport less than 90 min per week), moderately active lifestyle (exercising or playing sport at rates ranging between 3–5 times per week or participating in between 90–150 min of exercise per week) and active lifestyle (exercising most days of the week or participating in more than 150 min of exercise per week).

## 2.4. Procedure

The translation and Cross-cultural Adaptation included:

- *Forward translation*: The questionnaires implemented in the study were translated into Arabic from the original language (English) by two independent bilinguals whose first language is Arabic. The translators were a physical educationist and a sports psychologist, experienced in translating psychological questionnaires and aware of the purpose and the concepts applied in the questionnaire.
- *Back translation*: Following the previous process, the back translation from Arabic to English was done by two bilingual translators with a high level of English proficiency, whose mother tongue

is the Arabic language. They were experienced and taught in the field of sports psychology. They were unaware of the original version and uninformed of the purpose of the questionnaire.

- *Expert committee:* A multidisciplinary panel consisting of experts with a background in sports psychology, a physical educationist, a post-doctoral fellow and an applied statistician have reviewed the final Arabic version. Further, they also reviewed and evaluated all the translations and compared them to the original English version. Additionally, they also scrutinized the discrepancies and concluded that the translation items were idiomatically, semantically and culturally equivalent and reached consensus to form the draft of the Arabic version of the questionnaires.
- *Re-testing:* The final draft of the questionnaires was piloted on a sample of 30 recreational exercisers in order to assess the clarity of the items in the questionnaires. However, minor changes have been detected on two items based on the participants' feedback, which were resolved in order to assess semantic clarity of the items and ensure their understanding of the questionnaires.

Upon receiving permission to conduct this study, the Principal Investigator (PI) used the SQU's Network System to administer the instruments (Lifestyle exercise behaviour questionnaire; satisfaction with life scale; mental well-being scale and other demographic variables).

### **2.5. Statistical analyses**

Descriptive statistics such as the means and the standard deviations were calculated for the various scales and sub-scales in the instruments to achieve the purpose of the study. Furthermore, to determine group differences between the activity levels of the employees with regard to their psychological well-being, life satisfaction and body mass index, multivariate analysis of variance (MANOVA) were implemented. Finally Pearson's product-moment correlations were calculated to determine the relationships between the variables.

### **2.6. Ethical considerations**

To conduct this current study, formal permission has received from the Sultan Qaboos University (research and development committee). All employees were invited to participate in this study through the internal email service system after the principal investigator has approached all departments concerned. Invitation to participate in this study was sent to 750 university employees however, only 320 employees have finally reported back to take part in the study. All employees voluntarily participated in the study, and the researchers received consent to conduct the study from the college authority as well as from the participants. The study was conducted in 2014. The process of data collection was completed within 4 months from the starting date of the study.

## **3. Results**

### **3.1. Administration of the instruments**

Upon receiving formal permission to conduct the present study, the Principal Investigator (PI) communicated with the faculty head of the university and informed them of the purposes of the study and procedures to be followed during data collection. Once the faculty's permission was procured and necessary information attained through SQU's Network System, the Principal Investigator (PI) administered the questionnaires, which included the Lifestyle Physical Activity Questionnaire, Satisfaction with Life Scale, Psychological Well-being Scale and other demographic variables such as employee's country of origin, position at the university, BMI status and their level of exercise behaviour (vigorous exercise, moderate exercise, mild exercise, no exercise).

The descriptive results for the sample are presented in Table 1. These results include the mean score for the mental well-being satisfaction with life and BMI of the participants according to gender and lifestyle categories.



**Table 1. Descriptive statistics of the life style categories by grouped by gender**

Gender	Lifestyle activity levels	N	Mental well-being		Satisfaction with life		Body mass index (BMI)	
			Mean	SD	Mean	SD	Mean	SD
Male	No exercise	28	3.58	.686	3.92	1.45	28.33	7.20
	Mild exercise	53	3.89	.501	4.55	1.23	29.64	8.52
	Moderate exercise	55	3.87	.510	4.36	1.16	25.98	3.81
	Vigorous exercise	40	4.00	.547	5.03	1.07	25.92	3.66
	Total	176	3.86	.557	4.50	1.25	27.44	6.31
Female	No exercise	47	3.62	.570	4.51	1.38	24.40	5.22
	Mild exercise	43	3.93	.543	4.37	1.40	25.57	5.46
	Moderate exercise	32	3.81	.577	4.71	1.09	24.95	4.14
	Vigorous exercise	22	3.78	.502	4.67	1.17	24.98	6.36
	Total	144	3.78	.561	4.54	1.29	24.96	5.23
Total	No exercise	75	3.61	.611	4.29	1.42	25.87	6.28
	Mild exercise	96	3.91	.518	4.47	1.31	27.82	7.55
	Moderate exercise	87	3.85	.533	4.49	1.14	25.60	3.94
	Vigorous exercise	62	3.92	.538	4.90	1.11	25.59	4.76
	Total	320	3.82	.560	4.51	1.27	26.32	5.97

Table 1 differentiate between the results on the tree measures for both gender and exercise behaviour. The Table demonstrates that male employees doing vigorous exercise has higher Mental Well-Being ( $4.00 \pm .54$ ), Satisfaction with Life ( $5.03 \pm 1.07$ ) and lower BMI ( $25.92 \pm 3.66$ ) than their male counterparts doing less exercise. . To the contrary, female employee’s doing mild to moderate exercise reported higher Mental Well-Being ( $3.93 \pm .54$ ) and Satisfaction with Life ( $4.71 \pm 1.09$ ) than females doing vigorous exercise ( $4.67 \pm 1.17$ ). Finally, the Body Mass Index of Non exercisers (BMI) ( $24.40 \pm 5.22$ ) is less than the BMI of Vigorous exercisers ( $24.98 \pm 6.36$ ) and Mild exercisers ( $24.40 \pm 5.46$ ).

A one-way between-group multivariate analysis of variance (MANOVA) was conducted to determine significant differences between the activity levels of the employees for mental well-being, life satisfaction and body mass index. Normality, linearity, univariate and multivariate outliers as well as multicollinearity were assessed, and no serious violations of these assumptions were noted. However, Levene’s Test of Equality of Error Variances was smaller than .05 for life satisfaction ( $p = .02$ ) and BMI ( $p = .01$ ), indicating a violation of the assumption of equality of variance. Thus, the alpha level for determining significance of the two variables was adjusted downward to a more conservative alpha level of .025. The independent variable was the level of physical activity. The MANOVA confirmed a significant difference between the employees on different activity levels for the combined dependent variables ( $(F(9, 764.3) = 3.28, p > .00)$ : Wilks’  $\lambda = .91$ ; with  $d\eta^2 = .03$ ). When the results for the individual dependent variables were considered, no statistically significant differences were found for Body Mass Index (BMI) ( $F(3, 316) = 2.94, p > .033$ ;  $d\eta^2 = .027$ ) and Life Satisfaction ( $F(3, 316) = 2.79, p < .040$ ; with  $d\eta^2 = .026$ ). A significant difference was found for Mental Well-being ( $F(3, 316) = 5.25, p > .002$ ; with  $d\eta^2 = .047$ ) for employees at different activity levels. A *post hoc* analysis indicated that employees with a sedentary lifestyle ( $50.60 \pm 8.56$ ) had significantly lower levels of mental well-being than those who exercise (Tables 2–5).

**Table 2. MANOVA to determine significant differences between activity levels of the employees with regard to their mental well-being, life satisfaction and BMI**

Source	Dependent variable	Type III sum of squares	df	Mean square	F	Sig.	$d\eta^2$
Corrected model	Life satisfaction	333.48 <sup>a</sup>	3	111.16	2.79	.04	.02
	Well-being	931.12 <sup>b</sup>	3	310.37	5.24	.00	.04
	BMI	309.26 <sup>c</sup>	3	103.08	2.94	.03	.02
Intercept	Life satisfaction	160,466.91	1	160,466.91	4033.46	.00	.92
	Well-being	893,789.11	1	893,789.11	15,112.45	.00	.98
	BMI	214,145.85	1	214,145.85	6108.01	.00	.95
Physical activity	Life satisfaction	333.48	3	111.16	2.79	.04	.02
	Well-being	931.12	3	310.37	5.24	.00	.04
	BMI	309.26	3	103.08	2.94	.03	.02
Error	Life satisfaction	12,571.70	316	39.78			
	Well-being	18,689.04	316	59.14			
	BMI	11,078.90	316	35.06			
Total	Life satisfaction	176,258.00	320				
	Well-being	939,289.00	320				
	BMI	233,222.33	320				
Corrected total	Life satisfaction	12,905.18	319				
	Well-being total	19,620.17	319				
	BMI	11,388.16	319				

<sup>a</sup> $R^2 = .026$  (Adjusted  $R^2 = .017$ ).

<sup>b</sup> $R^2 = .047$  (Adjusted  $R^2 = .038$ ).

<sup>c</sup> $R^2 = .027$  (Adjusted  $R^2 = .018$ ).

**Table 3. Descriptive statistics on gender difference**

Variables	Gender	Mean	Std. dev.
Life satisfaction	Male	22.51	6.29
	Female	22.70	6.46
	Total	22.59	6.36
Well-being	Male	54.11	7.81
	Female	53.00	7.87
	Total	53.61	7.84
BMI	Male	27.45	6.32
	Female	24.97	5.24
	Total	26.33	5.97

A one-way between-groups multivariate analysis of variance (MANOVA) was conducted to determine the significant differences between the male and female employees with regard to their mental well-being, life satisfaction and body mass index. Normality, linearity univariate and multivariate outliers; homogeneity of variance-covariance matrices; and multicollinearity were assessed, and no serious violations of these assumptions were noted. The independent variable was gender. The MANOVA confirmed a significant difference between males and females for the combined dependent variables ( $F(1, 316) = 5.41, p = .00$ ); Wilks'  $\lambda = .951$ ; with  $d\eta^2 = .04$ ). When the results for the individual dependent variables were considered, mental well-being ( $F(1, 316) = 1.58, p = .209$ ; with  $d\eta^2 = .00$ ) and life satisfaction ( $F(1, 316) = .07, p = .785$ ; with  $d\eta^2 = .00$ ) showed no significant

**Table 4. MANOVA to determine significant differences between the male and female employees with regard to their mental well-being, life satisfaction and BMI**

Source	Dependent variable	Type III sum of squares	df	Mean square	F	Sig.	$d\eta^2$
Corrected Model	Life Satisfaction	3.03 <sup>a</sup>	1	3.03	.07	.78	.00
	Well-being	97.22 <sup>b</sup>	1	97.22	1.58	.20	.00
	BMI	487.35 <sup>c</sup>	1	487.35	14.21	.00	.04
Intercept	Life Satisfaction	161,859.39	1	161,859.39	3989.35	.00	.92
	Well-being	908,591.42	1	908,591.42	14,799.61	.00	.97
	BMI	217,551.60	1	217,551.60	6346.44	.00	.95
Gender	Life Satisfaction	3.03	1	3.03	.07	.78	.00
	Well-being	97.22	1	97.22	1.58	.20	.00
	BMI	487.35	1	487.35	14.21	.00	.04
Error	Life Satisfaction	12,902.15	318	40.57			
	Well-being	19,522.94	318	61.39			
	BMI	10,900.81	318	34.27			
Total	Life Satisfaction	176,258.00	320				
	Well-being	939,289.00	320				
	BMI	233,222.33	320				
Corrected Total	Life Satisfaction	12,905.18	319				
	Well-being	19,620.17	319				
	BMI	11,388.16	319				

<sup>a</sup> $R^2 = .000$  (Adjusted  $R^2 = -.003$ ).

<sup>b</sup> $R^2 = .005$  (Adjusted  $R^2 = .002$ ).

<sup>c</sup> $R^2 = .043$  (Adjusted  $R^2 = .040$ ).

**Table 5. Pearson product–moment correlation on the parameters by gender difference and combined**

	Male			Female			Combined		
	BMI	LS	MW	BMI	LS	MW	BMI	LS	MW
BMI*	1	-.098	.013	1	-.061	-.017	1	-.083	.015
LS*		1	.543**		1	.506**		1	.524**
MW*			1			1			1

\*BMI = Body Mass Index, LS = Life Satisfaction, MW = Mental Well-being.

\*\*Correlation was significant at the .01 level.

differences between genders. A statistically significant difference was found for the body mass index (BMI) ( $F(1, 316) = 14.21, p = .00$ , with  $d\eta^2 = .04$ ). The mean scores indicated that males ( $27.45 \pm 6.32$ ) had higher BMIs than females ( $24.97 \pm 5.24$ ).

The relationships between BMI, life satisfaction and well-being were investigated using Pearson product–moment correlation coefficients. There was a moderate positive correlation (Male:  $r = .54, n = 320, p < .00$  and Female:  $r = .506, n = 320, p < .00$ ) between life satisfaction and well-being for both male and female employees, indicating that workers who are more satisfied with life also have better psychological well-being.



#### 4. Discussion

The overarching aim of the study was to examine the role of exercise in the life satisfaction, mental well-being and body mass index (BMI) of university personnel, including differences between gender groups and groups with different activity levels (sedentary, mild, moderate and vigorous lifestyle employees). When the results for the individual dependent variables were examined, satisfaction with life and mental well-being showed no significant differences between gender groups. Thus, the well-being and life satisfaction of employees does not depend on the gender of the workers. A statistically significant difference was found only for body mass index (BMI), indicating that male employees had higher BMIs than female employees working at the university. This finding is an indication that men might be more overweight or obese than women.

However, it has often been noted in a number of studies that BMI is higher in the female population (Barker, Chorghade, Crozier, Leary, & Fall, 2006; Brian et al., 2011; Groth, Fagt, Stockmarr, Matthiessen, & Biloft-Jensen, 2009) and that BMI more greatly impacts the body image of women than of men (Ålgars et al., 2009). The findings also suggest that the awareness of physical activity could be lower among male employees. It is noteworthy, that women in Oman are often responsible for the household's chores, *such as cooking, shopping, caring for children and washing clothes*, apart from their jobs at the university. Taking into consideration that Oman as an Islamic country, women are often bound by certain constitutional rules and regulations, which cause barriers to their open performance of activities compared to women in Western countries. Therefore, this could also be the reason they may have to use their leisure time constructively and parsimoniously.

In conjunction with the above findings, a study of Oladipo, Osaat, Orluwene, and Suleman (2012) that investigated the nutritional health status of Nigerian adults showed that the male subjects presented a greater degree of obesity and were at a higher risk for cardiovascular disease than female subjects. A study conducted among adult men in Kuwait to determine whether BMI and its associated factors contributed to overweight and obese people, identified obesity as a global epidemic that is gradually becoming critical in the Gulf region, in which 48.5% of people were found to be overweight and 19.8% found to be obese (Al-Isa, Compbell, & Desapriya, 2013). Among Kuwaiti nationals, family history is an important predictor of being overweight or obese in higher income groups, with fatigue being an important risk factor. Other risk factors for being overweight and obese included increasing age; having an obese mother, brother(s) and/or other obese relatives; having a lower grade point average; being physically inactive; and being in poor health. These findings recommended behavioural changes and/or health education interventions to attend to the contributing factors for overweight and obesity in Kuwait. In context to the Omani population, a recent study of Al-Habsi and Hashem (2015) showed a similar result in healthy women from five provinces in Oman aged between 18 and 48 years of age. The results showed that married women were substantially more engage in moderate PA. Compared to the present study, the Al-Hazzaa, Musaiger, and Atls (2011) found a higher level of PA working women, as the employed women spent more time sitting on a non-working day while travelling and working, compared with unemployed women. In addition, the study also found that in comparison to urban areas, rural women spent significantly more time doing moderate PA. According to the World Health Survey, 59% of Omani women do enough exercise in Oman (Al-Riyami, Abd, Jaju, Al-Kharusi, & Al-Shekaili, 2012). However, a comparison of the Omani women's activity levels with those of women in other Gulf countries showed similar results. In a Saudi Arabian study, 40.6% of the studied men and women living in Riyadh exhibited low activity, 34.3% were minimally active and 25.1% were highly active (Eid & Diener, 2004)

This study also found statistically significant differences in the mental well-being of employees with different activity levels. Employees with a sedentary lifestyle had much lower levels of mental well-being than those who had mild, moderate and vigorous lifestyles. The finding is supported by research showing that physical activity enhances self-esteem, reduce stress and provide higher quality of life (Ahmed, Mladenovic, Ho, Lee, & Ali Khan, 2014; Gavin, 2005; Penedo & Dahn, 2002). The literature provides additional evidence that exercise affects mental well-being. This finding is similar to that found in numerous studies conducted worldwide using different samples (Abbas, Abbasi,

Vahidi, Najafipour, & Farshi, 2001; Edwards, 2006; Ten Have, de Beaufort, Teixeira, Mackenbach, & van der Heide, 2011a; Ten Have, de Graaf, & Monshouwer, 2011b). Physical activity has been effective for enhancing the quality of life (QOL) of older adults over relatively short periods of time. However, little is known about the long-term effects of physical activity, and even less is known about the possible mediators of this relationship. A study (Elavsky et al., 2005) of older adults over a 4-year period to determine the mediating effect of physical activity on well-being and life satisfaction showed that participation in regular physical activity has an immediate positive influence with long term effects on well-being and enhances quality of life, body image and self-esteem. Interestingly, increased feelings of well-being results in reduced anxiety and stress, which also alleviates a number of minor medical issues and financial burdens.

#### **4.1. Limitations of the study**

The study was limited to SQU employees. The questionnaire has its own limitations, and as such, any bias in the participants' responses could be considered a limitation of this study. Both the lifestyle of the participants and the variability of their dietary habits were beyond the scope of this study and could also be limitations. The reliability of BMI was challenged due to the limitation in providing information to assess the body fat distribution (Chan, Watts, Barrett, & Burk, 2003). The Centre for Disease Control and Prevention (2017) supplied information on the clinical limitation of BMI to indicate the surrogate problem of measuring the excess weight rather than excess body fat. The debate on the use of BMI seemed to reach a consensus that when someone was classified as obese according to BMI, the person was also most likely to be obese according to body fat percentage. The Centre for Disease Control and Prevention (2017) further suggested that BMI was a reasonable indicator of body fat for both adults and children. However, because BMI does not measure body fat directly, it should not be used as a diagnostic tool but rather as a measure to track weight status in populations or serve as a screening tool to identify potential weight problems among individuals. Therefore, the issue of calculating BMI would be a limitation of the study. Some people don't engage in regular physical exercise but sometime they are inclined to do so in social contexts, workplace environments and support of peers and as a result their productivity increase can best be understood by examining the Hawthorne effect could also be a limitation of the current study.

#### **5. Conclusion**

The assessment of satisfaction with life and mental well-being are particular important components of the self-care management model and show a significant moderate correlation between the two constructs. Increase in well-being is associated with increases in life satisfaction. This study concluded that although these measures doesn't depend on the gender of the university employees, a physically active lifestyle was associated with higher levels of mental well-being, but could not show the same for life satisfaction. Thus, university employees who exercise (regardless of the intensity level) seem to benefit from the effect of exercise on their well-being.

#### **6. Recommendation**

This study showed the benefit in Well-being University employees can get from exercise. Based on the finding of the study it is highly recommended that, this type of research is conduct frequently by the university, to promote employees' health awareness. Public awareness of the health concerns associated with low levels of physical activity and increased sedentary behaviour, and required health interventions aimed at changing lifestyle behaviours (Azza & Hashem, 2015). It is also recommended to promote exercise among the employees and encourage employees to know more about their health status. Programmes like "Shop with Your Doc" recently initiated by a network of hospitals in the US State of California, seemed to be effective in this regard (China daily, 2016). In addition, this study sought to examine exercise behaviour levels and its mediating role on life satisfaction and mental well-being among male and female employees working at the Sultan Qaboos University. Though, the present study did not include all employees working at the university, it is strongly recommended to conduct future research with larger samples. Further research with a larger sample has been recommended for more understanding of this issue.

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### Correction

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