Factors Associated with Health-Related Quality of Life among a Northern Jordanian Population

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DOI: ***10.2427/12680***
Accepted on December 28, 2017

ABSTRACT

Background: This study aimed to assess health-related quality of life among Northern Jordanians.
Methods: A cross-sectional design study was conducted at three shopping centres in northern Jordan. Respondents were invited to complete a questionnaire assessing their quality of life using the SF-36 health survey.
Results: Data were obtained from 915 Jordanian adults with a mean age of 33.8 years (SD = 28.2). The total SF-36 score for the whole population was 71.2. Females reported lower SF-36 scores in both physical and emotional health ($P < 0.001$), and the elderly reported the lowest physical health scores ($P = 0.05$). Physical health was dramatically affected by health problems such as rheumatoid arthritis, obesity, back pain and asthma ($P = 0.05$). Conversely, emotional health was adversely affected by monthly income ($P < 0.001$).
Conclusion: Quality of life among a northern Jordanian population was considered acceptable. Physical health worsened with ageing, obesity, back pain, rheumatoid pain, cardiovascular disease and asthmatic disease; however, emotional health was adversely affected by a lower socioeconomic level or chronic diseases. Young adults need more concern about their emotional health, which was highly affected by their economic level.

Key words: Jordan, obesity, quality of life, SF-36

INTRODUCTION

Health-related quality of life (HRQoL) is a concept encompassing subjective and objective benchmarks that allude to physical and psychosocial well-being [1]. Assessment of HRQoL among the general population has become an international concern due to aging populations, the growing prevalence of chronic conditions and the increasing cost of healthcare [2]. HRQoL is often used to monitor the health status of populations and to inform public health and healthcare policy, therefore it has great benefits for economic evaluation [2-4]. Due

to the importance of HRQOL, the Institute of Medicine incorporated it as one of 20 benchmarks to identify healthy people in 2020 [5].

Moreover, studies evaluating health status can identify groups that are at risk of poorer HRQoL and capture relationships between sociodemographic characteristics and health status [3,6-7]. Gender and age contribute to a poorer quality of life (QoL) in the general population [8-12]. In Brazil, lower QoL scores were associated with lower incomes, lower education levels, females aged 30–44 years and self-reported chronic medical conditions [8]. However, a study among medical students in Brazil reported that students in years 2, 3, 4 and 6 had low QoL scores for mental and physical dimensions of HRQoL, that female students had lower scores than males and that there was no correlation between family income and QoL scores [12]. Similar results were reported from Australia, where lower SF-36 scores were associated with ageing beyond 40 years, lower educational levels and male gender across most dimensions [11]. Furthermore, similar trends were also observed in Sweden [9] and Canada [10].

Jordan is small country located in the Middle East and it has an outstanding healthcare system compared with its neighbouring countries [13-14]. Jordanians reported lower scores than United States citizens in all SF-36 subscales [15]. Another study assessed the QoL among university undergraduate nursing students using the Arabic version of SF-36. This study revealed that the highest score (78.1) was within the physical functioning domain while the lowest score (52.3) was in the vitality domain [16].

Literature addressing the QoL among the Jordanian population is lacking, especially in northern Jordan. This grants this research the importance of building the cornerstone of the research background in the Jordanian context. Hence the objectives of this study were to assess HRQoL among a northern Jordanian population and to compare the HRQoL among various demographic and clinical groups.

METHODS

Design and sample

A cross-sectional design study was conducted at three shopping centres in northern Jordan between August and October 2016. These public locations were purposefully selected due to their crowded nature and their populations of different ages, genders and socioeconomic levels. Participants were recruited by invitation to a free medical check-up event (take care of your health) where anthropometric measurements including body weight, vision, height, blood glucose levels and blood pressure were all obtained by medical students from Yarmouk University under the observation of researchers. Past medical history was also obtained, and participants were asked about certain health problems including diabetes, hypertension, asthma, rheumatoid disease and cardiovascular diseases (CVD). The participants were considered to be hypertensive if they were diagnosed with hypertension and taking medication; however, high blood pressure was related to the value that was measured at the time of interview for participants not known to be hypertensive. Respondents then completed the validated Arabic version of a 36-item short form (SF-36) QoL questionnaire through a face-to-face interview. The inclusion criteria for participation were being older than 18 years and being a Jordanian citizen. Written consent was signed by each participant and ethical approval was obtained from the research committee at the Faculty of Medicine at Yarmouk University.

Measures

The SF-36 survey instrument, which was developed by the Medical Outcome Study, is a valid and reliable generic instrument that is used to assess HRQoL [7] among both healthy and unhealthy individuals [17-18]. Its validity and consistency have been investigated and proven in different communities [19-20]. The SF-36 was translated and adapted in three Arabic countries: Lebanon, Morocco and Tunis, based on International Quality of Life Assessment methodology, and the internal consistency reliabilities of the subscales ranged from 0.70 to 0.90 [21-23].

The SF-36 measures eight health domains: physical functioning, role limitation by physical health problems, bodily pain, vitality for fatigue, general health perceptions, social functioning, role limitation caused by emotional problems and mental health. The score for each domain ranges from 0 to 100, with higher scores denoting better functioning. The eight domains can be grouped into two main domains: 'physical component summary' (PCS) and 'mental component summary' (MCS) (21). PCS and MCS scores are represented on a standardized scale (as a T score with a mean of 50 and standard deviation (SD) of 10) and have better distributional properties (continuous and symmetrical) than individual SF-36 subscales.

Analytic strategy

The Statistical Package for Social Sciences (SPSS Inc, Chicago, IL) version 20.0 was used for data analysis. Frequency distributions and descriptive criteria were examined. Means and SD were computed for continuous variables, and percentages were computed for categorical variables. T-tests and ANOVA tests were used to compare the differences between groups for continuous variables where applicable. The score for each question in the questionnaire was first computed, before the participant's

score was calculated from 0 (poor situation) to 100 (best situation) to score the responses in each dimension. The significance level was set at <0.05.

RESULTS

Data were obtained from 915 adults in northern Jordan. The mean age of the respondents was 33.8 years (SD = 28.2). More of the participants were male (n = 605; 66.1%), and more than half were married (n= 525; 57.4%).

Approximately 60% of participants were from a low socioeconomic level (monthly income <JOD 500), and most lived in urban areas (n = 785; 85.8%). Characteristics of the participants are provided in Table 1.

The prevalence of some chronic diseases was also reported among participants, and the prevalence of hypertension, diabetes and asthma was less than 10%. Surprisingly, approximately one-quarter of participants were obese (n = 210; 23.0%), 155 (16.9%) suffered from back pain and 170 (18.6%) had rheumatoid pain.

The mean global SF-36 scores for each domain are provided in Table 2. The total SF-36 score for the whole population was 71.2, with the highest scores reported for the physical functioning domain (82.6) and the lowest scores for role limitation by emotional problems (56.8). The scores of the two main domains, PCS and MCS, were 72.8 and 60.8, respectively.

There were significant differences in the SF-36 score according to gender (Table 2), with females reporting significantly lower scores in both the PCS and MCS domains (70.2 and 56.6, respectively) ($P < 0.05$).

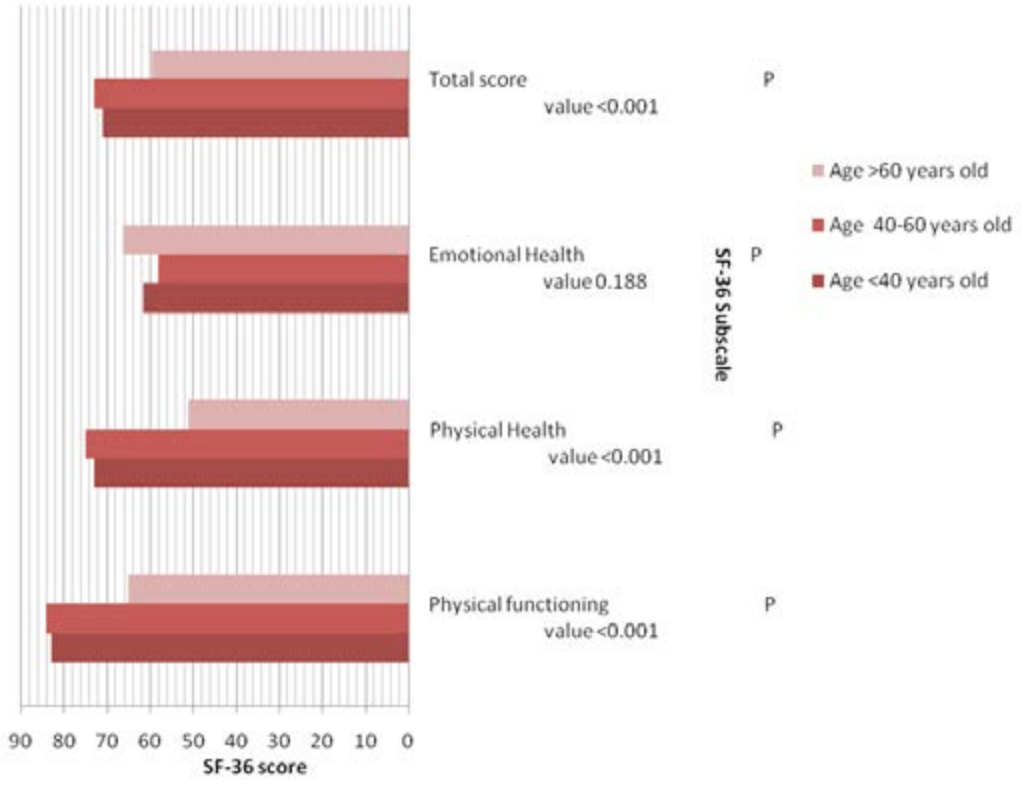
When comparing the mean QoL score, significant differences were also detected between different age groups. For example, the mean SF-36 score was lower among the elderly (>60 years old) ($P < 0.001$); however, these participants showed the highest score among all age groups with regards to emotional health ($P < 0.001$) (Fig. 1).

Furthermore, when reporting the QoL scores among different disease groups, participants with hypertension, diabetes and CVD showed the lowest emotional scores (i.e. MCS scores). Conversely, lower physical scores were found among patients with rheumatoid pain, back pain, obesity, CVD and asthma ($P < 0.001$) (Table 3).

DISCUSSION

This study assessed the QoL among adults in northern Jordan and generally revealed an acceptable physical health score; however, poor emotional perception and physical health were observed among certain groups. In

FIGURE 1. Comparison of average SF-36 scores among all age groups (n = 915)



**ANOVA test was applied for significant*

TABLE 1. Demographic and clinical characteristics of the study population (n = 915)

Demographic characteristics	N (%)	Clinical characteristics	N (%)
Age group (years)		**Hypertension**	
18–29	320 (35.0)	Yes	85 (9.3)
30–39	305 (33.3)	No	830 (90.7)
40–49	220 (24.0)		
50–59	40 (4.4)	**Diabetes mellitus**	
Above 60	30 (3.3)	Yes	55 (6.0)
		No	860 (94.0)
Sex		**Obesity**	
Male	605 (66.1)	Yes	210 (23.0)
Female	310 (33.9)	No	705 (77.0)
Education		**Asthma**	
Secondary level or less	380 (41.5)	Yes	50 (5.5)
Diploma or Bachelor's degree	445 (48.6)	No	865 (94.5)
Postgraduate	90 (9.8)		
Occupation		**Rheumatoid pain (joint pain, gout or knee pain)**	
Unemployed or student	370 (40.4)		
Employed	475 (51.9)	Yes	155 (16.9)
Retired	70 (7.7)	No	760 (83.1)
Monthly income		**Back pain**	
<JOD 500	545 (59.6)	Yes	170 (18.6)
JOD 500–1000	230 (25.1)	No	745 (81.4)
>JOD 1000	140 (15.3)		
Marital status		**Cardiovascular disease**	
Single	370 (40.4)	Yes	10 (1.1)
Married	525 (57.4)	No	905 (98.9)
Widow or divorced	20 (2.2)		
Smoking		**BP at time of interview**	
Nonsmoker	645 (70.5)	Normal	785 (85.8)
Light smoker	180 (19.7)	High (>140/90)	130 (14.2)
Heavy smoker	90 (9.8)		
Place of residence		**BMI**	
Village	785 (85.8)	<20	30 (3.3)
City	130 (14.2)	20–25	475 (51.9)
		25–30	200 (21.9)
		>30	210 (22.9)

TABLE 2. SF-36 subscale scores for the whole population (n = 915) and individually in males (n = 605) and females (n = 310)

SF-36 subscales	Mean score	SD	Male score (SD)	Female score (SD)	*P value	T-test value
Physical functioning	82.6	20.7	84.4 (18.4)	78.9 (24.3)	0.001	3.8
Role limitation by physical problems	67.4	39.3	69.0 (38.3)	64.1 (41.1)	0.075	1.7
Role limitation by emotional problems	56.8	43.8	56.3 (43.0)	57.8 (43.9)	0.633	–478
Vitality and energy	61.3	23.8	62.8 (21.6)	58.3 (27.2)	0.01	2.69
Emotional well-being	64.2	23.9	65.8 (23.8)	61.0 (23.7)	0.04	2.84
Social functioning	75.1	28.75	76.7 (27.7)	72.0 (30.4)	0.02	2.3
Pain	80.4	26.9	79.8 (26.)	81.4 (27.0)	0.41	–873
General health	71.0	29.3	66.7 (18.8)	79.1 (41.8)	0.001	–6.1
PCS	72.8	29.3	74.1 (18.8)	70.2 (24.3)	0.01	2.6
MCS	60.8	20.9	62.9 (29.7)	56.6 (33.4)	0.005	2.9

**Significant using the t-test*

TABLE 3. Relationship between sociodemographic and disease factors with HRQoL (n = 915)

Characteristics	N (%)	Physical health mean score	P value	Emotional health mean score	P value
Monthly income					
<JOD 500	545 (59.6)	57.7	<0.0001	69.2	<0.0001
>JOD 500	370 (40.4)	65.6		78.5	
Asthma					
Yes	50 (5.5)	59.2	<0.0001	47.6	<0.0001
No	865 (94.5)	73.5		61.6	
Hypertension					
Yes	85 (9.3)	74.1	0.5	64.1	0.3
No	830 (90.7)	72.6		60.4	
Diabetes mellitus					
Yes	55 (6.0)	68.7	0.134	47.8	<0.0001
No	860 (94.0)	73.0		61.6	
Obesity					
Yes	210 (22.9)	67.7	<0.0001	61.17	0.223
No	705 (77.1)	74.1		63.3	
Rheumatoid pain (joint pain or gout)					
Yes	155 (16.9)	61.7	<0.0001	56.0	0.08
No	760 (83.1)	75.0		63.0	
Back pain					
Yes	170 (18.6)	66.6	0.000	64.0	0.129
No	745 (81.4)	74.3		60.0	
Cardiovascular disease					
Yes	10 (1.1)	41.0	0.014*	44.2	0.02[a]
No	905 (98.9)	73.1		61.4	

T-test and ANOVA tests were applied wherever applicable.
[a]*Mann–Whitney U test was applied.*

another similar study, the Lebanese population showed high physical health scores and low emotional health scores [24]. It seems that the current poor economic situation in countries in the Middle East, and stress resulting from the ongoing war in neighbouring Syria, may contribute to poor emotional health in Jordanian and Lebanese people whose countries are bordered by Syria.

The results from this study indicate that many dimensions of SF-36 depend on age, gender and the perception of financial status, disease and mobility. Such findings could be used in the therapeutic and economic evaluation of individuals. Several other studies found similar results and reported that being young and male was associated with a better QoL score [8-12]. The traditional role of Arabic women includes being responsible for their children, their husband, the health of the elderly and the housekeeping. In addition, there is also an emerging role of sharing the man's role as the breadwinner, which may be detrimental to women's health. More attention should be given to females by encouraging them to practice physical exercise in the gym and overcoming cultural norms that adversely affect exercising.

The declining physical health scores with age could be attributed to the effects of ageing or the presence of other comorbidities. In Lebanon, people >60 years of age had lower QoL scores in all subscales [24]; however, the elderly showed the highest emotional health in this study. The inverse correlation between age and physical and mental health was reported by Albokordi et al. (2007) [25] and may reflect the poor accessibility of aged populations to healthcare services. Healthcare planners need to find up-to-date methods to reach people in this age group; for instance, by using community healthcare-based services in which team members visit the patients at home or creating alert systems to contact patients in case they do not attend their planned visit. This may positively impact on the physical health of the elderly and, in turn, favourably impact their QoL.

Similar to other studies, this study reported a significant correlation between income and mental and physical dimensions [8]. Hence, decision makers in Jordan need to take this into consideration and continue to increase the percentage of pensions proportionally with inflation to enable the ageing population to gain better access to private and public healthcare services which, in turn, will have a positive impact on their QoL.

In this study, obese individuals (BMI ≥30) experienced more limited physical function than those with a lower

BMI and reported lower QoL scores. After exploring the subscales of the SF-36, this limitation was found to be specifically related to physical functioning deficits and poor general health perceptions. The link between obesity and poor physical and mental health was well established by previous studies [26-29] and directly linked to poor QoL [30-31]. Obesity is a global problem that needs collaborative efforts, hence healthcare planners in Jordan need to raise public awareness of the adverse health effects of obesity using multiple approaches. School teachers and nurses need to be fully equipped with knowledge to inform students about the health effects of obesity and to teach them good practices to avoid it.

The physical domain of QoL was negatively affected by the presence of chronic illnesses such as rheumatoid arthritis (RA), back pain and asthma. Musculoskeletal conditions are a group of lifelong disorders (i.e. osteoarthritis, RA and low back pain) that are anatomically linked by their association with pain and impaired physical function [32]. They are the most common cause of chronic pain that significantly affects physical ability and the psychosocial status of both patients and their families [33]. Another musculoskeletal disease is back pain, which is usually defined as pain localized below the line of the twelfth rib and above the inferior gluteal folds [34]. In this study, adults suffering from RA or back pain experienced poorer physical but not emotional health. This was supported by studies that assessed the QoL among Moroccan and Egyptian RA patients [35-36). Adults with arthritis reported significantly lower HRQoL scores, mainly related to physical health, when compared to adults without arthritis ($P < 0.0001$). Other studies reported a devastating impact of RA on the patient's physical ability and QoL [37-39].

In this study, the mean SF-36 PCS and MCS scores (59.2 and 47.7, respectively) of asthmatic participants were lower than those expected in the general population ($P<0.0001$). However, other similar methodological studies in the general population confirmed that asthma was associated with impaired physical QoL [40-41]. Asthma is a chronic inflammatory disease characterized by breathing difficulty, mucous secretion, chest tightness and coughing, which impacts upon the QoL by preventing an individual from participating in certain activities, especially sports. Many patients with asthma avoid physical activity because they are concerned that it will exacerbate their asthma [42]. This concern is understandable as exercise-induced bronchospasm is a clinically-measurable phenomenon that can occur in most patients and may require treatment with bronchodilators [43].

Finally, suffering from CVD (i.e. postmyocardial infarction, stroke, congestive heart failure, stable angina and peripheral vascular disease) dramatically affects the QoL. In this study, the presence of CVD adversely impacted on the HRQoL of participants ($P < 0.05$). Several studies have also reported the association between HRQoL and CVD; for instance, Xie et al. (2008) [44] found that coronary heart disease was significantly associated with impaired HRQoL with dramatically impaired physical and mental health. Therefore clinicians should focus on controlling modifiable risk factors and the subjective perception of health in individuals at high risk of CVD.

CONCLUSION

In conclusion, although the overall QoL scores of people in northern Jordan were acceptable, the results of this study shed light on the importance of improving a participant's physical health as an important predictor of improving their HRQoL. Physical health was shown to worsen with ageing, obesity, back pain, rheumatoid pain, CVD and asthmatic diseases; however, emotional health was adversely affected by a lower socioeconomic level or chronic diseases. Therefore healthcare planners and decision-makers need to establish new approaches to enable the ageing population, those with a low economic status and females to access healthcare services, treat their needs and positively impact on their QoL. Further research is needed to explore other factors that are possibly associated with the physical domain of HRQoL, and longitudinal research is needed to validate these results.

Limitations

This study has some limitations including the snapshot nature of the cross-sectional design and the collection of data from only one geographical area in Jordan. This may affect the generalizability of the results to the whole Jordanian population. Further cohorts and longitudinal studies are needed to produce more precise results.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgments

The authors would like to thank faculty medical students (batch 2013) at Yarmouk University for their efforts in data collection. This paper was supported by the Deanship of Scientific Research and Graduate Studies at Yarmouk University.

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