



DOI:

10.22301/IJHMCRC.2528-3189.1149

Article can be accessed online on:
<http://www.ijhmcr.com>

ORIGINAL ARTICLE

INTERNATIONAL JOURNAL
OF HEALTH MEDICINE AND
CURRENT RESEARCH

IMPACT OF CHRONIC DISORDERS AND OBESITY ON QUALITY OF LIFE (QoL) IN NORTHERN REGION OF JORDAN

Laila M. Matalqah^{1*}, Khaldoon M. Radaideh², Romany H. Thabet^{1,3}

¹ Department of Basic Medical Sciences, Faculty of Medicine, Yarmouk University, Irbid-Jordan

² College of Applied Medical Sciences, Al-Qassim University, Buraida, Saudi Arabia.

³ Department of Pharmacology, Faculty Of Medicine, Assiut University, Egypt

ARTICLE INFO

Article History:

Received 08th Dec, 2018

Received in revised form

10th Jan, 2019

Accepted 11th Feb, 2019

Published online 31st Mar, 2019

Key words:

Obesity, Asthma, quality of life, SF-36, Jordan.

*Correspondence to Author:

Laila M. Matalqah

Department of Basic Medical
Sciences, Faculty of Medicine,
Yarmouk University, Irbid - Jordan.

E-mail:

laila.m@yu.edu.jo

ABSTRACT

Objectives: This study aims at assessing health-related quality of life among Jordanians with chronic disorders and

Methods and sampling: A cross-sectional design using convenient sampling technique was implemented and carried out face-to-face interviews with 915 Jordanians. Respondents were invited to complete a questionnaire assessing their quality of life using the SF-36 health survey. Details about their clinical history were documented.

Results: Data was obtained from 915 Jordanian adults from the general public with a mean age of 33.8 years (SD± 28.2). Obesity was prevalent in 23.0% of the participants and approximately 35% suffered from muscle-skeletal pain. The total SF-36 score for the whole population was 71.2 (Physical health was dramatically affected by having different health problems including rheumatoid arthritis, obesity and back pain (P<0.05).

Conclusion: Musculoskeletal pains, obesity and asthma are considered major factors associated with decreased perception of general health and impairment in both physical and mental domains of HRQoL in North Jordan.

Copyright © 2019, Laila M. Matalqah. This is an open access article distributed under the creative commons attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Laila M. Matalqah^{1*}, Khaldoon M. Radaideh², Romany H. Thabet^{1,3}, 2019 "Impact Of Chronic Disorders And Obesity On Quality Of Life (QoL) In Northern Region Of Jordan", *International Journal of Health Medicine and Current Research*, 4, (01), 1149-1158.

INTRODUCTION

Musculoskeletal conditions are group of lifelong disorders including: osteoarthritis, rheumatoid arthritis (RA), osteoporosis, and low back pain; linked

anatomically, by their association with pain and impaired physical function (1). Musculoskeletal disorders are currently the most common cause of pain and chronic disability (2). They are the most common cause of chronic pain and significantly affect the physical ability and psychosocial status of both patients as well as their families (3). Previous literatures showed that adults with arthritis reported significantly lower quality of life compared to adults without arthritis (4). Others reported a devastating impact of RA on a patient's physical ability and their quality of life (QoL) (4-6). Other conditions and chronic diseases have been reported to impact quality of life scores including bronchial asthma (BA) (7), and obesity (8,9).

Generic and disease specific QoL instruments have been validated for assessing the impact of different conditions or diseases on QoL. These instruments are suitable to be used on a wide range of population and patient groups. SF-36 is a widely used multidimensional scale to assess HRQoL among healthy individuals and patients (10, 11). The SF-36 measures eight health domains. Its validity and consistency has been investigated among different communities (12, 13).

The aim of this study is to assess the impact of musculoskeletal disorders, obesity and bronchial asthma on Quality of Life in Northern Jordan. To the best of researchers' knowledge, no similar studies have been conducted in Jordan.

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 with population of different age, gender, and socio-economic groups. Then, participants were recruited by inviting them to a free medical check-up event called (Take care of your Health) where anthropometric measurements including body weight, vision test, height, blood glucose level and blood pressure measurements were all obtained by a group of medical students from Yarmouk University under researchers' observation. Additionally, past medical history was obtained and asked about certain health problems including diabetes, hypertension, asthma, rheumatoid, and cardiovascular diseases. Regarding blood pressure, the participant was considered as hypertensive if he/she was diagnosed with hypertension and taking medication. But, high blood pressure is related to the value that was measured at the

time of interview for participants not known to be hypertensive. After that, using face-to-face interviews, respondents completed the validated Arabic version of SF-36 quality of life questionnaire. Inclusion criteria for participation were: being older than 18 years and being a Jordanian citizen. Written consent for participation was signed by each participant and ethical approval was obtained from research committee, Faculty of medicine at Yarmouk University.

Measures

A 36-Item Short Form (SF-36) Survey Instrument developed by the Medical Outcome Study (MOS) is a valid and reliable generic instrument used to assess HRQoL (14). SF-36 is a multidimensional scale used widely to assess HRQoL among both; healthy individuals and patients (10,11). Its validity and consistency have been investigated among different communities and reflected high degrees of validity and reliability (12, 15). The SF-36 was translated and adapted in three Arabic countries; Lebanon, Morocco, and Tunis, based on International Quality of Life Assessment (IQOLA) methodology and the internal consistency reliabilities of the subscales ranged from 0.70 to 0.90 (16, 17).

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. Each domain has scores range from 0 to 100, with higher scores denoting better functioning. The eight domains can be summarized by two main domains: 'physical component summary' (PCS) and 'mental component summary' (MCS). PCS and MCS scores are represented on a standardized scale (as a T score with a mean of 50 and standard deviation 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 Microsoft program was used for data analysis. Frequency distributions and descriptive criteria were examined. Means) for continuous variables and percentages and percentages for categorical variables were computed. The t-test and ANOVA test were used to compare differences between groups for continuous variables wherever it applicable. To score the responses in each dimension; first, it was scored for each question in the questionnaire and then the sample's score summed up and ranged from zero

(poor situation) to 100 (best situation). Significant level was set up at less than 0.05.

RESULTS

Data was obtained from 1150 participants of whom 915 questionnaires were valid for statistical analysis. Other questionnaires were excluded due to the incomplete questionnaire or not meeting the inclusion criteria. The mean age of the respondents was 33.8

years (SD± 28.2), with more male participation (n= 605) (66.1%). About 60% of participants had low socioeconomic level (monthly income <JOD500), and the majority of them lived in urban area (n=785; 85.8%). Regarding the academic level, about two-thirds of participants had diploma degree or higher, which indicates high education level of participants. The demographic characteristics of the participants are shown in Table 1.

Table 1. Characteristics of study population (n=915).

Characteristics	n (%)
Age group (years)	
18-29	320 (35%)
30-39	305 (33.3%)
40-49	220 (24.0%)
50-59	40 (4.4%)
above 60	30 (3.3%)
Gender	
Male	605 (66.1%)
Female	310 (33.9%)
Education	
Secondary level or less	380 (41.5%)
Diploma or Bachelor's degree	445 (48.6%)
Postgraduate	90 (9.9%)
Occupation	
Unemployed/ student	370 (40.4%)
Employed	475 (51.9%)
Retired	70 (7.7%)
Monthly income/JOD	
< 500	545 (59.6%)
500-999	230 (25.1%)
> 1000	140 (15.3%)
Marital Status	
Single	370 (40.4%)
Married	525 (57.4%)
Widow/ divorced	20 (2.2%)

The Total SF-36 score for the whole population was 71.2 (18.6), with the highest scores were reported for the physical functioning domain (82.6) and the lowest scores were for Role emotional (56.8). The total SF-36 score for the two main domains were: 'physical component summary' (PCS) = 72.8 and 'mental component summary' (MCS) = 60.8. Lower reported physical scores was among patients with rheumatoid pain, back pain, obesity, (P<0.001).

The prevalence of some chronic diseases among participants was reported. Surprisingly, about one-quarter of them; (23.0%, n=210) were obese, and 155 (16.9%) suffered from back pain, while (18.6%, n=170) had rheumatoid pain. The prevalence of musculoskeletal disorders and obesity among participants are illustrated in Table 2.

Table 2. The prevalence of musculoskeletal disorders, asthma, and obesity among participants (n=915).

Diagnosis	n (%)
Obesity	
Yes	210 (23.0%)
No	705 (77.0%)
Asthma	
Yes	50 (5.5%)
No	865 (94.5%)
Rheumatoid Pain (Joint pain / Gout/ Knee pain)	
Yes	155 (16.9%)
No	760 (83.1%)
Back pain	
Yes	170 (18.6%)
No	745 (81.4%)
BMI	
18.5 -24.99	505 (55.3%)
25-29.99	200 (21.8%)
≥30	210 (22.9%)

The mean scores of physical health domain of SF-36 were significantly reduced ($p<.0001$) in participants with obesity (67.7), rheumatoid (61.7) or back pains (66.6) and asthma (59.2) compared with non-obese (74.1), individuals free of rheumatoid pains (75), individuals with no back pains (74.3) and asthma-free participants (73.5) respectively. On the other hand, there

was a highly significant difference ($p<.0001$) between the means of scores of emotional health domain in asthmatic participants (47.6) and those of non-asthmatic (61.6). However, there was no significant difference with regard to means of scores of emotional health domain as shown in Table (3).

Table 3. SF-36 score reported by disease and non-disease group (n=915).

Characteristics	n (%)	Physical Health Mean	P value	Emotional Health	P value
<u>Obesity</u>					
Yes	210 (23.0%)	67.7		61.17	
No	705 (77.0%)	74.1	<.0001	63.3	0.223
<u>Rheumatoid Pain (Joint pain / Gout/ Knee pain)</u>					
Yes	155 (16.9%)	61.7		56.0	
No	760 (83.1%)	75.0	<.0001	63.0	0.08
<u>Back pain</u>					
Yes	170 (18.6%)	66.6		64.0	
No	745 (81.4%)	74.3	0.000	60.0	0.129
<u>Asthma</u>					
Yes	50 (5.5%)	59.2		47.6	<.0001
No	865 (94.5%)	73.5	<.0001	61.6	
T-test test was applied					

It was observed that, in asthmatic participants, there was a highly significant reduction of mean total SF

score (58.4, $p<.001$) and scores of physical functioning(75.0, $p<.0008$), role physical(40.2, $p<.001$),

vitality/ energy(57.0, $p<.01$), emotional wellbeing(53.6, $p<.001$), social functioning(62.5, $p<.001$), pain(64.0, $p<0.02$), general health(62.0, $p<.001$), physical (59.2, $p<.002$) and mental components (58.4, $p<.001$) compared with non-asthmatics. Regarding the impact of rheumatoid pains on quality of life, mean total SF score was significantly reduced compared to free individuals (62.8, $p<.001$) in addition to significant reduction of scores of physical functioning(72.9, $p<.0001$), role

physical(59.7, $p<.02$), vitality/ energy (51.8, $p<.001$), emotional wellbeing(58.2, $p<.01$), pain(62.6, $p<0.0001$), physical (61.7, $p<.0001$). Similarly, back pains caused significant reduction of total SF score (67.0, $p<0.0001$) and some of its components (i.e. physical functioning(72.1, $p<.0001$), role physical(61.8, $p<.001$), role emotional(64.6, $p<.0001$), pain(75.4, $p<.005$), general health(59.2, $p<.0001$), physical (66.5, $p<.0001$) components (Table 4).

Table 4. SF scores as classified by Disease (N=915).

SF-36 subscales	Asthma N=50	Non- asthma N=865	*P value	Rheu matoid Pain N=155	Without Rheumat oid Pain N=760	*P value	Back Pain N=170	With out back pain N=745	*P value
Physical functioning	75.0	83.0	0.008	72.9	84.5	0.0001	72.1	84.9	0.0001
Role physical	40.02	68.9	0.001	59.7	68.9	0.021	61.8	68.6	0.001
Role emotional	26.6	58.6	0.188	44.4	59.3	0.670	64.6	55.2	0.0001
Vitality/ Energy	57.0	61.5	0.01	51.8	63.3	0.001	56.8	62.3	0.674
Emotional wellbeing	53.6	64.8	0.001	58.2	65.4	0.010	60.5	65.1	0.202
Social functioning	62.5	75.8	0.001	60.8	77.9	0.094	75.2	75.1	0.158
Pain	64.0	81.3	0.02	62.6	84.0	0.0001	75.4	81.5	0.005
GH	62.0	71.5	0.001	65.9	72.0	0.789	72.5	70.6	0.000
PCS	59.2	73.5	0.002	61.7	75.0	0.000	66.5 588	74.2 349	0.000
MCS	47.6	61.5	0.001	46.8	63.6	0.081	64.0	60.0	0.528
Total Rand score	58.4	71.9	0.001	62.8	72.9	0.00	67.0	72.1	0.000
T-test was applied									

Table 5 showed that obesity impacted quality of life as evidenced by significant reduction ($p < 0.01$) of mean total SF score in obese (66.9) and overweight (71.3) individuals compared with those with normal body weight (72.9). Some components of SF score are also significantly reduced in obese and overweight persons. Vitality/energy, emotional wellbeing, general health, physical component and mental component scores in obese participants were (51.2, $p < 0.001$), (56.9, $p < 0.001$), (63.3, $p < 0.0001$), (69.6, $p < 0.018$) and (55.4, $p < 0.012$) respectively. As demonstrated in table (6), the present study revealed that physical component of HRQoL was significantly reduced in

relation to sociodemographic factors such as monthly income (57.7 in participants with less than 500 JOD versus 63.7 in those with more than 1000 JOD, $p < 0.0001$) and some diseases e.g. asthma (59.2 vs 73.5, $p < 0.0001$), obesity (67.7 vs 74.1, $p < 0.0001$), cardiovascular diseases (41.0 vs 73.1, $p < 0.0001$), musculoskeletal disorders as in rheumatic (61.7 vs 75.0, $p < 0.0001$) and back pains (66.6 vs 74.3, $p < 0.0001$). Emotional health component also was reduced significantly ($p<.0001$) in persons with less than 500 JD (69.2) vs , 79.1 in those with more than 1000 JOD, asthmatics (47.6 vs 61.6), diabetics (47.8 vs 61.6) and cardiac individuals (44.2 vs 61.4).

Table 5. SF scores as classified by BMI (N=915).

SF-36 subscales	Normal BW BMI 18-25 N= 505	Overweight BMI 25-30 N= 205	Obesity BMI >30 N=205	*P value
Physical functioning	83.4158	82.9512	80.1220	0.153
Role physical	68.8	63.4	67.6	0.252
Role emotional	56.3	61.6	53.3	0.154
Vitality/ Energy	64.9	62.3	51.2	<0.001
Emotional wellbeing	67.9	62.3	56.9	<0.001
Social functioning	74.7	78.2	73.2	0.181
Pain	81.3	79.2	79.2	0.514
GH	74.4	70.1	63.3	0.000
PCS	74.4	72.0	69.6	0.018
MCS	61.5	64.2	55.4	0.012
Total Rand score	72.9	71.3	66.9	0.01
BMI: Body Mass Index as classified by WHO				
*Significant using ANOVA				

Table 6. Relationship between socio-demographic and disease factors with HRQoL (n=915).

Characteristics	N (%)	Physical Health Mean	P value	Emotional Health	P value
Monthly income			<.0001	69.2	<.0001
<JOD 500	545(59.6%)	57.7		77.9	
JOD500-1000	230(25.1%)	66.7		79.1	
>JOD 1000	140(15.3)	63.7			
Asthma	50 (5.5%)		<.0001	47.6	<.0001
Yes	865 (94.5%)	59.2		61.6	
No		73.5			
Obesity	210 (23.0%)		<.0001		0.223
Yes	705 (77.0%)	67.7		61.17	
No		74.1		63.3	
Rheumatoid Pain (Joint pain / Gout)	155 (16.9%)		<.0001		0.08
Yes	760 (83.1%)	61.7		56.0	
No		75.0		63.0	
Back pain	170 (18.6%)	66.6	0.000	64.0	0.129
Yes	745 (81.4%)	74.3		60.0	
No					
T-test and ANOVA tests were applied wherever applicable					

The present study , by using conditional logistic regression statistical test, showed that the factors associated with decreased perception of general health

are as follow: Income < 500 JOD, Age>60 years old, Asthma, Rheumatoid arthritis, Back Pain and BMI >30 (see table 7).

Table 7. Factor associated with decreased perception of general health.

Variable	B	OR	95%CI	P-value
BMI >30	-0.369	0.691	0.417-0.989	0.03
Income < 500 JOD	-1.504	0.222	0.115-0.430	<0.001
Age>60 years old	-1.450	0.235	0.087-0.639	0.005
Back Pain	-0.831	0.436	0.271-0.700	0.001
Rheumatoid arthritis	-1.040	0.353	0.221-0.566	<0.001
Asthma	-1.798	0.341	0.085-0.323	<0.001
A Conditional logistic regression was applied for all variables				
Odd ratio: OR, odd ratios; CI, confidence interval				

DISCUSSION

The concept of HRQoL is complex and reflects to how much the individual is satisfied and enjoys life (18). With the presence of chronic noxious illnesses, the perception of satisfaction in life ultimately varies among unhealthy or diseased persons. As the studies on HRQoL are lacking in Northern Jordan, the present study analysed the impact of some chronic illnesses as back pain, rheumatic pain, bronchial asthma and obesity on HRQoL among Jordanian adults. The present study used The Medical Outcomes Study 36-item Short-Form Health Survey (SF-36) to compare HRQoL of individuals suffering from asthma, low back pain, rheumatic pain and obesity with healthy persons. SF-36 assesses the extent of effect of physical health on individual's functional ability, mental and social wellbeing (19-21).

It was found that there is an overall significant reduction of the total SF-36 scores among patients with asthma, rheumatoid pain, back pain and obesity and. "Physical component summary" domain was significantly reduced compared with healthy participants. These results are in agreement with many previous studies with regard to the aforementioned health problems.

Asthma is a common worldwide chronic disease that leads to restrictions in physical, emotional and social aspects of patient's quality of life. Recently, Geraldo et al. reported that asthmatics have worse QoL, even though the symptoms of asthma are under clinical control (22). The current study revealed significant impairment in physical domain of QoL among asthmatics patients compared to non-asthmatic individuals. In our study, most of participants are middle aged (mean age of 33.8 years), having higher academic degrees with controlled asthma. In agreement, another study reported that there was greater impairment of quality of life among middle aged asthmatic patients (23).

Previous recent works reported that different characteristics and magnitude of impact of asthma on QoL is expected to occur depending on several patient factors including age and severity of asthma. Contrarily, a study by Francisco-Javier and his colleagues mentioned that advanced age, lower education level, and poor control of the asthma are the most important factors affecting QoL (24). The most important clinical parameter causing significant impairment in QOL of asthmatic patients are poor asthmatic control (25) and disease severity (26-28). However, Stucky et al. have found that social roles and activities are the strongest predictors of asthma-specific QOL (29).

On the other hand, the present study showed that the psychological domain of SF-36 for asthmatic patients is significantly reduced. A recent study recommended that the psychosocial well-being should be assessed for asthmatic patients during clinic visits for effective improvement of outcome (30). The bad implication of asthma on QoL may be secondary to symptoms the patients suffer, amount of medications required, the fear of exposure to triggers or events (31), in addition to the fear of life-threatening attacks and increased comorbidity burden (32).

The present work illustrated significant reduction of physical domain of SF-36 score with the consequence of impairment of QoL. On the contrary, the mental component is insignificantly changed compared with healthy participants. Rheumatoid arthritis (33) and low back pain (34) affected the physical component of SF-36 negatively. On the other side, a study by Rahman and his colleagues reported that low back pain could have an effect not only on students' physical aspects of quality of life but also on psychological and social aspects of QoL (35). Similarly, Baykara et al. reported that the association of rheumatic pain with low back pain leads to a significant decrease in the functional capacity and QoL as well as increase in depression risk (36). However, it was observed that QOL was good in patients

with low back pain regardless of their moderate disability (8).

A significant reduction of physical, mental, general health, emotional wellbeing and vitality domains in addition to total scores of SF-36 was observed among the study participants. Obese participants having BMI >30 kg/m² reported the lowest HRQoL scores comparing with normal BMI or even the overweight persons with BMI 25-30 kg/m². Previous studies by some investigators have shown lower SF-36 scores for general health perceptions and vitality in patients seeking treatment for obesity with mean BMI, 38.1 kg/m² (37). In another study, it was reported that severe obesity, unlike being overweight, was associated with significant deterioration in all domains of HRQL(38). Physical domain includes the ability of performance of daily activities which was highly affected by weight gain (39). Similarly, a wide cross-sectional study reported that higher BMI was found to negatively affect the physical domain of HRQoL(40). On the other hand, psychological aspects such as self-esteem, body image, and emotional state were impaired and ultimately lead to declining of QoL with an increase in weight (41-43). However, higher BMI patients report lower scores in physical, but not mental domains of HRQoL (44).

CONCLUSION

In conclusion, this study highlighted some health related problems that have bad impact on quality of life in north Jordanian people. It revealed that, in addition to advanced age and low income; obesity, back and rheumatic pains and asthma are considered major factors associated with decreased perception of general health and impairment in both physical and mental domains of HRQoL. We recommend that health care system should pay great attention to reinforce health education about importance of weight loss to avoid obesity complications. Periodic assessment of patients with rheumatic and back pains is highly advised. It is a fundamental role for clinicians to control asthmatic patients for acute exacerbations and deterioration of severity. Further researches are needed in North Jordan to investigate other health related problems that interfere with good quality of life.

Conflict of interest

The author declares no conflict of interest.

REFERENCES

1. Woolf AD. The bone and joint decade 2000-2010. *Ann Rheum Dis*. 2000;59(2):81-82.
2. Theofilou P, Panagiotaki H. The association between musculoskeletal disorders and quality of life. *J Trauma Treatment*. 2012;1:e101.
3. Woolf AD, Akesson K. Understanding the burden of musculoskeletal conditions. the burden is huge and not reflected in national health priorities. *BMJ*. 2001;322(7294):1079-1080.
4. Centers for Disease Control and Prevention (CDC). Health-related quality of life among adults with arthritis--behavioral risk factor surveillance system, 11 states, 1996-1998. *MMWR Morb Mortal Wkly Rep*. 2000;49(17):366-369.
5. Scott D, Garrood T. Quality of life measures: Use and abuse. *Best Practice & Research Clinical Rheumatology*. 2000;14(4):663-687.
6. Umay EK, Bal A, Gundogdu I, Karsli PB. Polyneuropathy and radiculopathy in rheumatoid arthritis patients with low back pain: Clinical characteristics, functional disability, depression, anxiety and quality of life. *The Egyptian Rheumatologist*. 2015;37(4):151-157.
7. Doz M, Chouaid C, Com-Ruelle L, et al. The association between asthma control, health care costs, and quality of life in france and spain. *BMC pulmonary medicine*. 2013;13(1):15.
8. Ahdhi GS, Subramanian R, Saya GK, Yamuna TV. Prevalence of low back pain and its relation to quality of life and disability among women in rural area of puducherry, india. *Indian Journal of Pain*. 2016;30(2):111.
9. Pimenta FB, Bertrand E, Mograbi DC, Shinohara H, Landeira-Fernandez J. The relationship between obesity and quality of life in brazilian adults. *Frontiers in psychology*. 2015;6:966.
10. Ware JE, Kosinski M, Dewey JE. *How to score version 2 of the SF-36 health survey (standard & acute forms)*. QualityMetric Incorporated; 2000.
11. Ware JE. Scoring the SF-36. *SF-36.Health Survey: Manual and Interpretation Guide*. 1993.
12. Garratt A, Schmidt L, Mackintosh A, Fitzpatrick R. Quality of life measurement: Bibliographic study of patient assessed health outcome measures. *BMJ*. 2002;324(7351):1417.
13. Lee CW, Chi KN. The standard of reporting of health-related quality of life in clinical cancer trials. *J Clin Epidemiol*. 2000;53(5):451-458.

14. Contopoulos-Ioannidis DG, Karvouni A, Kouri I, Ioannidis JP. Reporting and interpretation of SF-36 outcomes in randomised trials: Systematic review. *BMJ*. 2009;338:a3006.
15. Lee CW, Chi KN. The standard of reporting of health-related quality of life in clinical cancer trials. *J Clin Epidemiol*. 2000;53(5):451-458.
16. Guermazi M, Allouch C, Yahia M, et al. Translation in arabic, adaptation and validation of the SF-36 health survey for use in tunisia. *Annals of physical and rehabilitation medicine*. 2012;55(6):388-403.
17. Younsi M. Health-related quality-of-life measures: Evidence from tunisian population using the SF-12 health survey. *Value in Health Regional Issues*. 2015;7:54-66.
18. Varni JW, Burwinkle TM, Seid M. The PedsQL TM 4.0 as a school population health measure: Feasibility, reliability, and validity. *Quality of life research*. 2006;15(2):203-215.
19. Aaronson NK, Muller M, Cohen PD, et al. Translation, validation, and norming of the dutch language version of the SF-36 health survey in community and chronic disease populations. *J Clin Epidemiol*. 1998;51(11):1055-1068.
20. Garratt AM, Ruta DA, Abdalla MI, Buckingham JK, Russell IT. The SF36 health survey questionnaire: An outcome measure suitable for routine use within the NHS? *BMJ*. 1993;306(6890):1440-1444.
21. Framework IC. The MOS 36-item short-form health survey (SF-36). *Med Care*. 1992;30(6):473-483.
22. Geraldo José Cunha Â, Zbonik Mendes A, Dias Wanderley de Carvalho, Felipe, Aparecida Ribeiro de Paula, Maria, Gonçalves Brasil T. The impact of asthma on quality of life and anxiety: A pilot study. *Journal of Asthma*. 2018:1-6.
23. Nalina N, Chandra MS. Assessment of quality of life in bronchial asthma patients. *International Journal of Medicine and Public Health*. 2015;5(1).
24. Baiardini I, Braidò F, Brandi S, et al. The impact of GINA suggested drugs for the treatment of asthma on Health-Related quality of life: A GA2LEN review. *Allergy*. 2008;63(8):1015-1030.
25. Al Zahrani SS, El Morsy E, Laila S, Dorgham L. The impact of bronchial asthma on quality of life among affected children and adolescents in taif city, saudi arabia. *Life Sci J*. 2014;11(6):283-291.
26. Hossny E, Caraballo L, Casale T, El-Gamal Y, Rosenwasser L. Severe asthma and quality of life. *World Allergy Organization Journal*. 2017;10(1):28.
27. Uchmanowicz B, Panaszek B, Uchmanowicz I, Rosinczuk J. Clinical factors affecting quality of life of patients with asthma. *Patient Prefer Adherence*. 2016;10:579-589.
28. Ekici A, Ekici M, Kara T, Keles H, Kocyigit P. Negative mood and quality of life in patients with asthma. *Quality of Life Research*. 2006;15(1):49-56.
29. Stucky BD, Sherbourne CD, Edelen MO, Eberhart NK. Understanding asthma-specific quality of life: Moving beyond asthma symptoms and severity. *Eur Respir J*. 2015;46(3):680-687.
30. Banjari M, Kano Y, Almadani S, Basakran A, Al-Hindi M, Alahmadi T. The relation between asthma control and quality of life in children. *International journal of pediatrics*. 2018;2018.
31. Dunne M, Hughes M. *How does asthma affect the day-to-day life of sufferers?*. 2015.
32. McDonald VM, Hiles SA, Jones KA, Clark VL, Yorke J. Health-related quality of life burden in severe asthma. *Med J Aust*. 2018;209(S2):S28-S33.
33. Matcham F, Scott IC, Rayner L, et al. The impact of rheumatoid arthritis on quality-of-life assessed using the SF-36: A systematic review and meta-analysis. . 2014;44(2):123-130.
34. Ogunlana M, Odunaiya N, Dairo M, Ihekuna O. Predictors of health-related quality of life in patients with non-specific low back pain. *African Journal of Physiotherapy and Rehabilitation Sciences*. 2012;4(1-2):15-22.
35. Panahi R, Mohammadi B, Kazemi SS, Geshti SN, Reza M. Low back pain, disability and quality of life among university students. *International Journal of Musculoskeletal Pain Prevention*. 2016;1(4):173-177.
36. Baykara RA, Bozgeyik Z, Akgul O, Oztocmen S. Low back pain in patients with rheumatoid arthritis: Clinical characteristics and impact of low back pain on functional ability and health related quality of life. *Journal of back and musculoskeletal rehabilitation*. 2013;26(4):367-374.

37. Fontaine KR, Cheskin LJ, Barofsky I. Health-related quality of life in obese persons seeking treatment. *J Fam Pract.* 1996;43(3):265-271.
38. Hassan M, Joshi A, Madhavan S, Amonkar M. Obesity and health-related quality of life: A cross-sectional analysis of the US population. *Int J Obes.* 2003;27(10):1227.
39. Backholer K, Wong E, Freak-Poli R, Walls H, Peeters A. Increasing body weight and risk of limitations in activities of daily living: A systematic review and meta-analysis. *Obesity reviews.* 2012;13(5):456-468.
40. De Zwaan M, Petersen I, Kaerber M, et al. Obesity and quality of life: A controlled study of normal-weight and obese individuals. *Psychosomatics.* 2009;50(5):474-482.
41. Kushner RF, Foster GD. Obesity and quality of life. *Nutrition.* 2000;16(10):947-952.
42. Wee CC, Davis RB, Huskey KW, Jones DB, Hamel MB. Quality of life among obese patients seeking weight loss surgery: The importance of obesity-related social stigma and functional status. *Journal of general internal medicine.* 2013;28(2):231-238.
43. Taylor VH, Forhan M, Vigod SN, McIntyre RS, Morrison KM. The impact of obesity on quality of life. *Best practice & research Clinical endocrinology & metabolism.* 2013;27(2):139-146.
44. Castres I, Folope V, Dechelotte P, Tourny-Chollet C, Lemaitre F. Quality of life and obesity class relationships. *Int J Sports Med.* 2010;31(11):773-778.
