

ORIGINAL ARTICLE

STUDY ON HEALTH RELATED QUALITY OF LIFE AMONG KNEE OSTEOARTHRITIS PATIENTS.

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Abstract

Aims: The main aim was to measure the quality of life among symptomatic knee osteoarthritis (OA) patients attending a primary care clinic and to find any correlation between the medical status and socio-demographic characteristics of knee OA patients with their quality of life. **Methods:** A cross-sectional study using SF-12 form questionnaire was conducted in a primary care clinic in Kedah, Malaysia. By universal sampling, all symptomatic knee OA patients visiting this clinic were given the questionnaire after consulting the doctor. **Results:** A total of 126 patients were recruited. 30 (23.8%) were men and 96 (76.2%) were women. The mean age of the patients was 63.6 years \pm 10.3 SD. Half of the patients had their body mass index (BMI) in the obese category. The mean duration of knee pain was 1.87 years \pm 0.66 SD. The commonest co-morbidity was hypertension (34.2%). Domains related to the physical health status showed relatively lower scores compared to the mental health components. There was a significant negative correlation between physical functioning (PF) and age ($p < 0.05$). Patients without any co-morbidities scored higher than those with co-morbidities. Quality of life (QOL) scores were better among employed patients compared to the unemployed. Patients with no formal education scored lower than those with formal education, with significant differences in the physical functioning (PF), role physical (RP), and general health (GH) components. **Conclusion:** This study showed that patients with knee OA had a lower score in physical health status compared to the mental health component.

Introduction

Osteoarthritis (OA) of the knee is the common form of chronic arthritis in the community affecting 26.9 million US adults in 2005 up from 21 million in 1990¹. The prevalence increases with age. Overall OA affects 13.9% of adults aged 25 years and older and 33.6% of those 65 years and above.

The prevalence of knee OA is higher than that of hip OA especially in Asian populations². Symptomatic knee osteoarthritis affects 4.3 million adults aged more than 65 years old with an estimated prevalence of 30% in this age group³. Women are twice as likely to suffer from knee OA as men. The COPCORD study in Malaysia showed that 9.3% of adult Malaysians complained of knee pain with a sharp increase to 23% in those over 55 years of age and 39% in those over 65 years^{4,5}.

In a study done by Zainal F Zakaria et al, the mean age of the patients presented with osteoarthritis was 65.5 years, with female predominance of 78.8%⁶. Half of the patients were overweight and the majority i.e. 91.4% had at least one co-morbidity, the commonest being hypertension. As OA presents more in the elderly, a patient's co-morbidities must be taken into consideration in measuring their quality of life.

OA with its symptoms and potential physical disability can affect the patient's quality of life and may cause psychiatric problems such as anxiety, depression and despair in the elderly. It has been shown that those living with OA are associated with decreased quality of life⁷.

Health related quality of life (HRQOL) is a multidimensional concept that covers a broad aspect of health and wellbeing of a person. According to the Centre for Disease Control and Prevention (2000), HRQOL is the most suitable tool to measure the quality of life (QOL) in terms of the impact of a disease or any medical condition on their quality of life. It is also defined as "an individual's or group's perceived physical and mental health over time".

HRQOL covers emotional, physical, social and subjective feelings of wellbeing that reflect an individual's subjective evaluation and reaction to his illness. Symptoms such as joint stiffness, constant pain that limits the movement and joint damage in knee OA may cause significant physical disability, resulting in negative influence in many aspects of patients' life including their relationships, psychosocial impact, and functional disability to work⁸.

One study done in the primary care setting in Malaysia found patients with knee OA attending the government health clinic had relatively poor quality of life in their physical health but their mental health was less affected⁶.

The objective of this study was to measure the quality of life among patients with symptomatic knee OA attending a primary care clinic, using HRQOL assessment tool and to study the risk factors among the patients attending the clinic and correlate between the medical status and socio-demographic characteristics of these patients with their quality of life.

Methods

This cross-sectional study involved distribution of questionnaires to all patients with symptomatic knee OA attending a primary care clinic in Alor Star, Kedah. It was conducted between 17 to 31st May 2013. By universal sampling, all knee OA patients visiting this clinic were administered the questionnaires after consulting the doctor. All patients were diagnosed with the knee OA based on the American College of Rheumatology criteria.

Prior to the study a letter requesting permission to use the SF-12 form was sent to Quality Metric. The study was conducted after ethical approval was obtained. Prior consent was also obtained from the patients. Questionnaires used consisted of 12-item short form (SF-12) to measure HRQOL in this study. Socio-demographics of the study subjects consisted of age, gender, ethnicity,

marital status, social support, level of education, employment status and medical status.

The SF-12 form was designed to measure generic health concepts relevant across age, disease and treatment groups⁹. This version of SF-12 form had already being translated and validated by the Malaysian National Quality of Life Survey¹⁰. It measured eight domains consisting of physical functioning, role-physical, bodily pain, general health, vitality/energy, social functioning, and role emotional and mental health (see **Table I**). Scores on each scale ranged from a minimum of 0 to a maximum of 100, with higher scores indicative of better health. The questionnaire was prepared in order to evaluate the patients' quality of life as related to osteoarthritis.

The questionnaires were pre- tested on several people who were non- medical orientated. The questionnaires were reviewed and modified according to the feedback obtained from pre-test. Subjects were asked to complete the questionnaire together with a face-to-face interview. If there was a problem in understanding the questionnaire, the researcher would re-read and explain further.

A weighing scale and height measuring tape were used to obtain the weight and height of the subjects. Then, the Body Mass Index (BMI) for each subject was calculated by the researchers. All patients' identity and personal information were kept confidential.

Details on variables used are listed in **Table I**. Data were analyzed using the Statistical Package for Social Sciences version 15.0 (SPSS Inc, Chicago, IL, USA).

The Quality Metric Health outcomes scoring software 4.5 was used to analyze the patients' quality of life. It consisted of 12 items which measure eight scales ; physical functioning (PF), role limitations due to physical problems (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role limitations due to emotional problems (RE), and mental health (MH). On the basis of these separate subscales, component summary scores can be calculated to provide a global measure of physical (Physical

Component Summary score, PCS) and mental functioning (Mental Component Summary score, MCS), respectively. The scale scores range from 0 to 100, with higher scores indicating a better health status. Age, BMI and duration of knee pain were entered as continuous variables while other variables were entered as binary categorical. The association between the variable and QOL scores were analyzed.

Results

There were a total of 130 patients during the study period. Four patients did not complete their questionnaire. Thus 126 (96.9%) completed the study.

Socio-demographics characteristics

The mean age of the patients was 63.6 years with ± 10.3 Standard deviation. The minimum age was 31 years old and the maximum was 84 years old. The majority were Malay (91.3 %), followed by Chinese (7.1%), Indian (0.8%) and others (0.8%). This matches the population itself in Kedah. Thirty (23.8%) were men and 96 (76.2%) were women. 84.9% were married with remaining (15.1%) widowed/divorced or single. The majority (93.7%) lived with their families and had primary school level of education (34.9%) followed by no education (34.1%), secondary school level of education (27.8%) and tertiary level (3.2%). 58.7% were unemployed /retired.

Patients' medical characteristics.

A total of 56 (44.4%) of patients did not have any coexisting chronic diseases, 47 (37.3%) had one, 20 (15.9%) had two, and 3(2.4%) had three. None of them had more than 4 chronic diseases. The most frequent concomitant diseases with knee pain were hypertension (34.2%), diabetes mellitus (32.6%), gout (4%) and asthma (1.6%). The mean duration of knee pain was 1.87 years. The majority i.e. 73 patients (57.9%) had knee pain duration between 1-5 years, followed by 35 (27.8%) which was less than 1 year duration. Only 13.5% (17) had this pain for 6-10 year and one patient (0.8%) had knee pain more than 10

years. Only one patient (0.8%) had been hospitalized for the knee pain in the past one year. 50% (63) of the patients had body mass index (BMI) in the obese category, followed by 34.9% (44) who were overweight, 12.7% (16) normal and 2.4% (3) underweight.

Overall scores of quality of life dimensions

The profile of SF-12 quality of life dimensions scores are shown in **Table II**.

Those who scored below 50 indicated worse or poor health outcomes, 50 is normal and above 50 is better or good health outcomes. Domains related to the physical health status showed relatively lower score compared to the mental health component.

Detailed analysis (see **Figure 1**) showed that 76% of the patients scored below 50 under the physical component summary (PCS) which indicates that they have a poor health outcome in relation to the knee osteoarthritis while only 50% of the patients scored lower than 50 under mental component summary. Thus, knee OA affected the patient's physical health status more than the mental health status component.

Using Pearson Correlation test, there was a significant negative correlation between age and the following: physical functioning (PF) ($r_s = -0.292$, $p < 0.05$), role physical (RP) ($r_s = 0.299$, $p < 0.05$), general health (GH) ($r_s = 0.276$, $p < 0.05$), and social functioning (SF) ($r_s = 0.282$, $p < 0.05$). The other QOL scores were not significant.

Male patients had better scores in all QOL domains, however none of the domains were significant with gender. The association of QOL scores with social support, marital status and duration of knee pain were not significant ($p > 0.05$). Patients with no formal education scored lower than those with formal education, where significant differences was found in the physical functioning (PF), role physical (RP), and general health (GH) with $p = 0.041$, $p = 0.007$, and $p = 0.02$ respectively. QOL scores were better among employed patients compared to the unemployed with significant differences found in most of the dimensions except VT, RE, and MH. Significant difference was found between social

functioning (SF) with employment status ($p = 0.018$). Patients without any co morbidities scored higher than those with co morbidities, but there were no significant difference found except in bodily pain (BP) ($p = 0.012$).

Those who had lower body mass index (BMI) scored higher in QOL scores with only one significant difference that was general health (GH) ($p = 0.038$), while other domains were not significant between QOL and BMI.

Discussion

Aging, female gender, and high BMI were contributing factors to knee OA. The majority of the patients in this study were from the older age group. The mean age for patients with knee OA in this study was 63.6 years and almost similar to the previous study done in Malaysia⁶.

In our study, the majority of the subjects who presented with knee OA were females (96%). According to MOH's Clinical Practice Guidelines on the Management of Osteoarthritis 2002, women are twice as likely to suffer from knee OA as men.

Another study done by Abdoli Behrouz et al found that 73.7% of elderly women were suffering from knee OA¹¹.

Half of the patients with knee OA in this study were obese. However, there was no significant correlation between BMI and QOL scores except for general Health (GH). This was different from other studies where patients with $BMI \geq 30$ had lower QOL score in all domains except social functioning (SF). A significant difference was found in the bodily pain domain even after adjustment for confounders ($p = 0.044$, $p = 0.008$ respectively) ⁶. A strong association was found between high BMI and the presence of knee OA in another study¹². In this study, most of the patients had hypertension (34.2%) followed by diabetes mellitus (32.6%). This finding correlated the study done by the National Health Morbidity Survey II and III (2006) which stated that the prevalence of hypertension (42.6%) was much higher than diabetes mellitus (14.9%).

Table I: Variables used in the study

Conceptual Definition	Operational Definition	Scale Measurement
General Health Perceptions		
Rate of their health generally	Respondents are asked to rate their health perception	Excellent Very good Good fair poor
Physical functioning		
Moderate activities, such as moving a table, vacuuming, bowling	Respondents are asked whether their health now limit them in performing this activity, if so how much does it affected.	Yes, limited a lot Yes, limited a little No, not limited at all
Climbing several flights of stairs	Respondents are asked whether their health now limit them in performing this activity, if so how much does it affected.	Yes, limited a lot Yes, limited a little No, not limited at all
Role physical		
Accomplished less than would like	Respondents are asked during for the past 4 weeks, whether they accomplished less than would like on work/activities as a result of their physical health.	Yes No
Limited in the kind of work or other activities	Respondents are asked, during for the past 4 weeks, whether they have limited in the kind of work/activities as a result of their physical health.	Yes No
Bodily pain		
Extent of pain which interfered with normal work	Respondents are asked during the past 4 weeks, how much pain interfered their normal work (including both work outside the home and the housework).	Not at all A little bit Moderately Quite a bit Extremely.
Vitality/ energy		
Have a lot of energy	Respondents are asked whether they have a lot of energy for the past 4 weeks.	All of the time Most of the time A good bit of the time Some of the time A little bit of time None of the time
Social functioning		

Frequency health problems interfered with social activities Respondents are asked on the amount of time during the past 4 weeks that is being affected by their physical health or emotional problems interfered with their social activities (like visiting with friends, relatives, etc.) All of the time
Most of the time
Some of the time
A little of the time
None of the time

Role emotional

Accomplished less than would like Respondents are asked whether they accomplished less work or other activities as a result of any emotional problems (such as feeling depressed or anxious) for the past 4 weeks. Yes
No

Didn't do work or other activities as carefully as usual Respondents are asked whether they didn't do work or other activities as carefully as usual due to the result of any emotional problems (such as feeling depressed or anxious) for the past 4 weeks. Yes
No

Mental health

Felt calm and peaceful Respondents are asked whether they felt calm and peaceful for the past 4 weeks and its frequency. All of the time
Most of the time
A good bit of the time
Some of the time
A little bit of time
None of the time

Felt down Respondents are asked whether they felt down for the past 4 weeks and its frequency. All of the time
Most of the time
A good bit of the time
Some of the time
A little bit of time
None of the time

Table II: Overall scores for quality of life dimensions

	Physical Health Status					Mental Health Status		
	Physical Functioning (PF)	Role-Physical (RP)	Bodily Pain (BP)	General Health (GH)	Vitality (VT)	Social Functioning (SF)	Role-Emotional (RE)	Mental Health (MH)
Mean	36.70	38.52	38.90	35.12	54.38	39.11	39.90	44.86
SD	10.45	13.66	11.14	9.90	10.08	13.73	15.12	12.93
Minimum	25.58	23.61	21.66	23.90	29.39	21.32	14.70	18.32
Maximum	57.06	57.46	57.73	63.66	68.74	56.90	56.28	64.21

*scores range from 0-100 with higher scores indicating better functioning

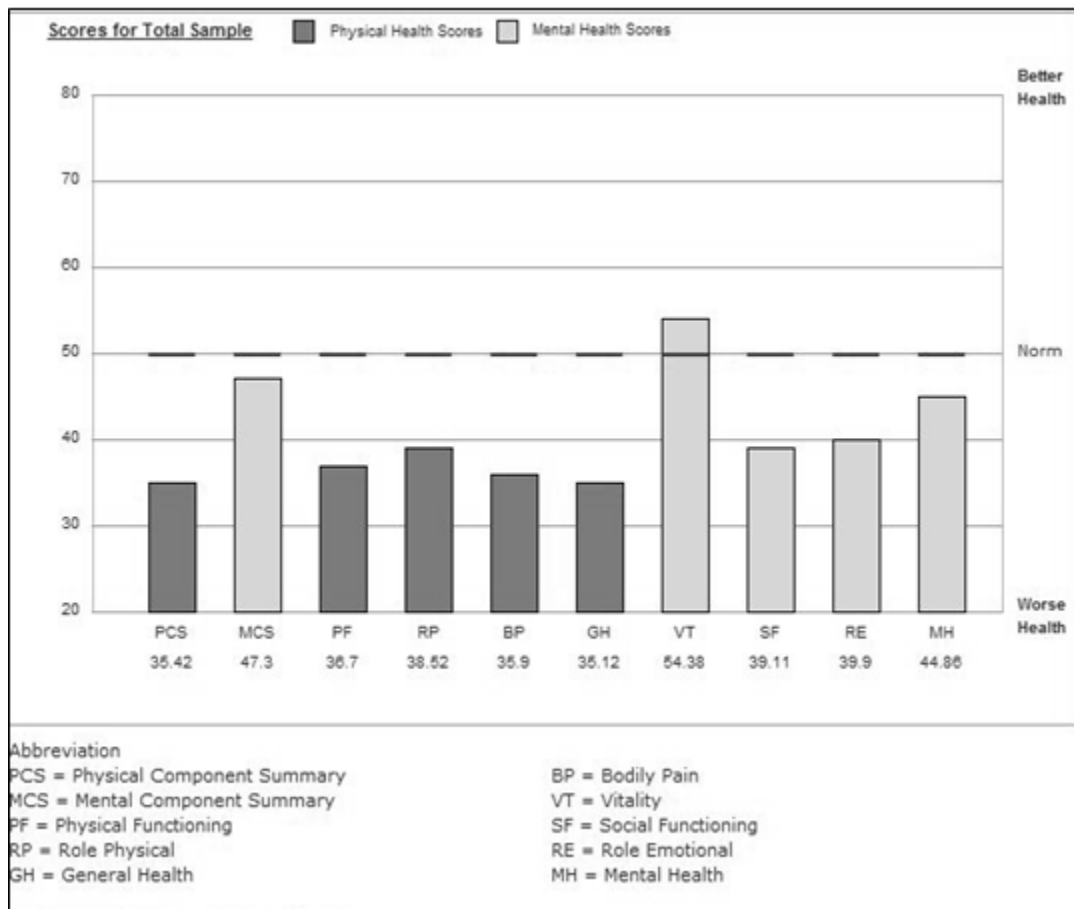


Figure 1: Scores for total sample

This goes hand in hand with a previous study that focused on co-morbidities in OA. It showed that chronic conditions, such as hypertension, cardiovascular diseases, obesity, respiratory diseases and diabetes can be found alongside OA¹³.

Patients who did not have any co morbidities scored higher in QOL domains compared to those who had co morbidities. Similar findings were reported by a previous study where there was a significant difference in SF6. However, in this study a significant difference was found only in bodily pain (BP) ($p= 0.012$). This could be due to patients with comorbidities and at the same time they were also manual workers as the majority were farmers. In Kedah, most of the elderly people were still involved with paddy planting, thus it was more significant in the bodily pain domain. Another study showed that coexistent moderate or severe diseases was related to

limitations in activities and pain¹⁴. Thus, the primary health care providers should be alert to the presence of co-morbidities that could affect QOL when managing patients with OA of the knee¹⁵.

There was no significant correlation between duration of knee pain, social support, marital status and QOL score in this study. This finding was contrary with previous study⁶, where the authors reported that the association between duration of knee pain and all the QOL domains (except RE domains) showed significant negative correlation in RP domain. Another study found that social support components significantly affected QOL scores¹⁶. Social support complementing interventions like pain relief and improving physical disability could enhance health outcomes.

In terms of the level of education, this study found that those who did not have any formal

education scored lower than those who received a formal education. The level of education was one of the important factors affecting knee OA patients' quality of life in the domains of physical functioning (PF), role physical (RP), and general health (GH). This was proven by some studies, in which their subjects with one or more years of education had a better physical function ($p=0.021$)¹⁷. In this study there was a significant correlation between physical function (PF), role physical (RP) and level of education. For those who had a better level of education, they were able to adapt to the knee pain and their type of work, whereas, those who did not receive any formal education, were limited to more manual work which contributed for their lower QOL scores. In this study, no significant correlation was found in marital status, but there was a significant correlation in employment status. Patients who were still working scored higher than those who were unemployed in all domains. A negative correlation was found in PF, RP, BP, and SF. These results were similar with the study by Abdoli Behrouz et al¹⁸.

A relatively lower score in physical health status compared to mental health status was similar with the previous studies. According to Zainal et al^{6, 19}, this could be due to better coping mechanism and adaptation to this chronic disease. Furthermore, Affleck et al¹⁹ studied the coping styles and mood changes in patient with knee OA and rheumatoid arthritis (RA). Patients with knee OA would use various coping methods to reduce pain and have a better mood compared with patient with rheumatoid arthritis. In this study, the mental health status was better than the physical health status probably due to the patients' ability to cope and adapt to their illness.

Limitations

Firstly the study period was short (only within 6 weeks). Thus the researchers did not have enough time to study a larger sample size and were unable to continue with a follow up study of the subjects. Secondly, this study was

only carried out among patients attending one primary care clinic. Thus, the findings might not be representative to all primary care practices in Kedah. Further, this study was carried out in primary care clinic where patients had mostly milder conditions than patients under specialist care. Moreover, Chinese and Indians were under represented as the majority of the population in Kedah were Malays. Finally, most of the respondents were elderly and some of the information might be erroneous due to their poor recall.

Conclusion

This study indicated that patients with knee OA had a lower score in physical health status compared to the mental health component. Males had better scores compared to female patients in all QOL domains. This study showed that general practitioners should try to improve the physical health of patients with knee OA, with particular care for elderly and female patients, and to help relieve the pain in patients with higher BMI. Advice on weight reduction is essential as most of the knee OA patients fall under obese category. QOL scores were better among employed patients compared to the unemployed with significant differences found in most of the dimensions except vitality/energy (VT), (role emotional (RE), and mental health (MH). Patients without any co morbidities scored higher than those with co morbidities. Thus general practitioners should be alert to the presence of co-morbidities when managing patients with osteoarthritis of the knee. Future longitudinal studies are needed to identify interventions to reduce pain and to improve patients' quality of life especially for their physical health.

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Conflict of Interest

Authors declare no conflict of interest and no fund was allocated for this study.

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