ORIGINAL ARTICLE

THE MEASUREMENT OF QUALITY OF LIFE AMONG POPULATION WITHIN THE CROWD: A CASE STUDY AMONG MALAYSIAN PILGRIMS IN MAKKAH

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ABSTRACT

Hajj and 'Umrah pilgrimage are a huge congregation performed by Muslims in Makkah, Saudi Arabia. The pilgrimage causes overcrowding and congestion that can lead to a high risk of health problems, especially when pilgrims have health problems. The purpose of this study is to assess the reliability of EQ-5D as a measuring tool to capture the health status of the pilgrims. Data collection was done during Ramadhan's 'Umrah in 2014. In this cross-sectional study, a total of 300 self-administered questionnaires attached with the EQ-5D-5L questions were distributed to Malaysian 'Umrah pilgrims in Makkah and willing to participate in the study. The outcomes from the questionnaires and EQ-5D-5L were systematically analysed by using the SPSS software. The response rate was 64%, involved female (53%) and male (47%) respondents with the mean age of 55 years old. Hypertension (21.5%) and diabetes (16.2%) were the commonest underlying health problems suffered by the respondents in this study. Based on the EQ-5D outcomes, 53.3% of the respondents had no problem in their movement. However, the mean of EQ-VAS (visual analogue scale) presented 83 out of 100 scaling point, which means they might have problems in their health status. In addition, this study revealed, respondents with underlying illnesses had difficulty in some dimensions in EQ-5D. Hypertension was identified as the commonest underlying disease amongst the pilgrims. A contradicted outcome from the objective and subjective measuring scales of EQ-5D and EQ-VAS respectively; presented its sensitivity of EuroQol as a measuring tool for the quality of life among pilgrims living within such congestion.

Keywords: 'Umrah, EuroQol, health status during 'Umrah

INTRODUCTION

The health economist assumed, human was born with stock of health and it may decrease or increase depend on several factors [1]. In addition, from the view of health economists, a person's health is an output, which depend on several input such as age, physical make-up, life-style, environmental factors, and the medical care consumption [2]. These inputs could decrease or increase the stock of health on a particular person. When there is a presence of inputs on a person's health status that may affect his/ her life, it is known as quality of life [3]. Quality of life is a perception of individuals' life in culture and value systems' context, which they live and related to their goals, expectation, standard and concern [4]. It frequently emphasising the components of happiness and satisfaction in life. However, quality of life has different meaning to different people. For example, in clinical trials, researchers concern on evaluating the aspects which are affected by disease or treatment. Sometimes, it shall be extended to include the indirect consequence from disease or treatment such as unemployment or financial difficulties [3].

To distinguish the quality of life between its general use and in health care area, the term health-related quality of life (HRQoL) is frequently used to avoid ambiguity. It is commonly used in determining its association with diseases such as chronic obstructive pulmonary disease (COPD) [5], HIV [6] and several others. HRQoL has increasingly become an important outcome measure for assessing the effects of health conditions and interventions [7]. It has been measured by using disease-specific instruments [8, 9] and generic instruments as used in our study. Generic instruments is more preferable and commonly used in HRQoL studies [5, 8] because generic instruments enable compare the health states on a patient with the effect of a treatment, while disease-specific only able to detect a simple change in a patient [5]. For the purpose of economic evaluation, the HRQoL should be measured using a preference-based utility measure such as EQ-5D or Health Utilities Index (HUI) [10]. For our study, we have used EQ-5D instrument to measure Malaysian pilgrims' health status during the mass gathering of 'Umrah.

The EQ-5D is a general health measure of health status developed by EuroQol Group [11] that is usually used in clinical studies [12]. EuroQol Group is a collaborative group of researchers engaged in an outcome measurement which is working toward the development of standardized, non-disease specific instrument for describing and particularly valuing HRQoL [11]. The EQ-5D health descriptive profiles consists of five dimensions; mobility, self-care, usual activities, pain and discomfort, and anxiety or depression. Each

dimension has five levels of problems; no problems, slight problems, moderate problems, severe problems, and extreme problems. Respondents will choose whether they have problems or not on each dimensions. The other part in EQ-5D namely, EQ-VAS. It is a visual analogue scale which respondents will rate their possible health state by their own on twenty centimetre vertical scale. This twenty-centimetre vertical scale has its endpoints labelled as "the best health you can imagine" and "the worst health you can imagine". This HRQoL instrument has never been used to measure pilgrims' *'Umrah*. Therefore, we conducted a study using this preference-based instrument to observe Malaysian pilgrims' health status.

Muslims perform pilgrimage at Makkah in Saudi Arabia. There are two types of pilgrimage in Islam, which is major and minor pilgrimage. The major pilgrimage known as *Hajj*. It is obligated to be performed by Muslims as long as he or she mentally, physically and financially capable. Or else, they must have at least an intention to do so once in their life time [13, 14]. *Hajj* is seasonal, which only happened on Dhul-Hijjah, the twelfth month in Islamic lunar calendar. Other than *Hajj*, Makkah also set up for a smaller ritual, which can be done at any time called *'Umrah*. *'Umrah* in an Islamic terminology means paying a visit to Ka'abah. It is a mini *Hajj* that can be performed any time of the year as there is no fixed time for its performance. It can also be performed along with *Hajj* [15]. According to The Jordan Times 2013, the busiest time for *'Umrah* is during the fasting month called Ramadhan, the ninth month in Islamic lunar calendar.

During *Hajj*, approximately two to three million people gather at the same place [13, 16] resulting in congestion and lead to the spread of communicable diseases among pilgrims [16, 17]. Furthermore, communicable diseases also may occur because of physical exertion, overcrowding and high prevalence of pre-existing health conditions [18]. Meanwhile, *'Umrah* is differs from *Hajj* where *'Umrah* can be done in anytime. *'Umrah* during Ramadhan marks the peak *'Umrah* season, especially in the second half of the month [19]. Both pilgrimages were considered as religious mass gatherings because a group of more than a thousand people present in a location [20]. Studies regarding pilgrims' health status during *'Umrah* were still lacking especially on Ramadhan compared to studies regarding *Hajj*. Nevertheless, *Hajj* and *'Umrah* were considered as one of the largest mass gathering in world. Therefore, we can still use the *Hajj*-related literatures for our study.

Health status of a person were susceptible due to their age, illness, or the condition on a particular place. Hence, we used HRQoL instrument, EQ-5D to measure pilgrims' health status during religious mass gathering of *'Umrah* in Ramadhan. Furthermore, the study was conducted within fasting month on Ramadhan where pilgrims might have felt relatively more stress, mentally and physically.

METHODOLGY

Study design and data collection

This is a cross-sectional study, in which the sample selection represented the target population of Malaysian pilgrims performing *'Umrah* during fasting month (Ramadhan). The sample size was determined by Raosoft's sample size formulation at http://www.raosoft.com/samplesize.html with margin error of five percent and a confidence level of 95% that came out our total sample size was 378 pilgrims. The data collection was conducted by the well-trained enumerators among *Mutawwif* from Yaskin Travel & Tours.

The respondents were given a set of questionnaire that comprised of socio-demographic and socio-economics questions was previously approved by the ethical board of Universiti Sains Malaysia attached with an EQ-5D-5L. It consists of two parts, five-dimension health descriptive and visual analogue scale. The EQ-5D questionnaire was officially permitted from EuroQol team (www.euroqol.org). Besides, it has been tested for its reliability and validity in Malaysia and it was proven that the EuroQol questionnaire is reliable and valid [4, 21].

EQ-5D health descriptive part contains five dimensions; mobility, self-care, usual activities, pain and discomfort, and anxiety or depression. Each dimension has five levels of problems. Ways to analyse this health descriptive was clarified in Table 1 below. From the table, we may identify the health state as 12345.

Meanwhile, as previously mentioned, EQ-VAS or EuroQol visual analogue scale has a vertical scale with a value of a hundred at the top and zero at the bottom. Respondents will rate their own health conditions on which scale from value zero to a hundred. The best health condition will equal to a hundred while the worst will equal to zero. The analysis of the respondents' input was conducted by using Statistical Package of Social Science (SPSS) version 22 for Windows.

Table 1 EQ-5D-5L descriptive system

Under each heading, please tick the ONE box that best describes your health TODAY		Levels of perceived problems are coded as follows;
Mobility		Level 1 is coded as '1'
I have no problems in mobility	√	
I have slight problems in mobility	□	
I have moderate problems in mobility	□	
I have severe problems in mobility	□	
I have extreme problems in mobility	□	Level 2 is coded as '2'
Self-care		
I have no problems in self-care	□	
I have slight problems in self-care	√	
I have moderate problems in self-care	□	Level 3 is coded as '3'
I have severe problems in self-care	□	
I have extreme problems in self-care	□	
Usual activity		
I have no problems in my usual activity	□	
I have slight problems in my usual activity	□	
I have moderate problems in my usual activity	√	
I have severe problems in my usual activity	□	Level 4 is coded as '4'
I have extreme problems in my usual activity	□	
Pain and discomfort		
I have no problems in feeling pain and discomfort	□	
I have slight problems in feeling pain and discomfort	□	
I have moderate problems in feeling pain and discomfort	□	
I have severe problems in feeling pain and discomfort	√	Level 5 is coded as '5'
I have extreme problems in feeling pain and discomfort	□	
Anxiety or depression		
I have no problems in feeling anxiety or depression	□	
I have slight problems in feeling anxiety or depression	□	
I have moderate problems in feeling anxiety or depression	□	
I have severe problems in feeling anxiety or depression	□	
I have extreme problems in feeling anxiety or depression	√	

The example identifies respondent's health status as 12345

RESULTS

The respond rate from the respondents was 50% (191 respondents). Among those who responded, female respondents were higher (53%) than male (47%). Their mean of age was 55±12 years old and 43% of them had education level till secondary school. Most of them are unemployed. The average income for both monthly and household were estimated RM3118.74 and RM5035.24, respectively. The outcomes were summarized in Table 2 below.

Table 2 Demographic characteristics of respondents

Demographic characters	Frequency (%)
Gender	
Male	90 (47)
Female	101 (53)
Age (mean± SD= 55±12 years old)	
15-24	8 (4.2)
25-34	7 (3.7)
35-44	14 (7.3)
45-59	92 (48.2)
60-64	30 (15.7)
> 65	40 (20.9)
Highest education level	
Not educated	12 (6.3)
Primary	36 (18.8)
Secondary	82 (43)
Tertiary	61 (31.9)
Occupation	
Government	32 (16.8)
Private	19 (9.9)
Self-working	54 (28.3)
Not working	75 (39.3)
Unknown (missing)	11 (5.8)

Respondents' health conditions

Based on the survey, there were respondents suffering more than one underlying illnesses whereby 37.7% (n=74) of them brought their own medications from Malaysia. therefore, they have to bring more than one medicines with them for the *'Umrah*. Table 3 presented type of underlying illnesses and medicines brought by the respondents from Malaysia to Makkah.

Table 3 Underlying illness and an alternative medicine brought by respondents from Malaysia

Underlying illness	Frequency (%)	Medications	Frequency (%)
1) Diabetes	31 (16.2)	1) Diabetes	26 (13.6)
2) Hypertension	27 (21.5)	2) Hypertension	38 (19.9)
3) Pneumonia	2 (1.0)	3) Panadol/ Paracetamol	34 (17.8)
4) Sore joints	7 (3.7)	4) Medicated oil	8 (4.2)
5) Heart disease	13 (6.8)	5) Gastric	7 (3.7)
6) Gallstone	1 (0.5)	6) Diarrhea	7 (3.7)
7) Gout	2 (1.0)	7) Heart disease	11 (5.8)
8) Stroke	1 (0.5)	8) Vitamin	18 (9.4)
9) Others (blood thickens, cholesterol, gastric, and unknown)	24 (12.6)	9) Flu	22 (11.5)
		10) Cough	25 (13.1)
		11) Others (not mentioning the medicines' name)	52 (33)
Total	**108**		**248**

Table 4 Category of respondents within underlying illnesses and medications from Malaysia

Respondents' underlying illnesses category	Frequency (%)	Respondents' medications category	Frequency (%)
Did not have any underlying illnesses	117 (61.3)	Did not bring any medicines	69 (36.1)
Have one type of underlying illness	33 (17.3)	Respondents did not have any underlying illness	57 (29.8)
Have more than one type of underlying illnesses	41 (21.5)	Respondents have the underlying illnesses	62 (32.5)

Respondents' health status

The respond rate for the EQ-5D questionnaire was (96.3%). Table 5 tabulated the frequency of problems captured in EQ-5D health descriptive profiles started with level one (no problems) until level five (extreme problems) reported by pilgrims in accordance to gender.

Majority of respondents (51.3%) claimed that they had no health problems (11111). Followed by 11121 (12.6%), which indicated that they had slight problems in pain and discomfort, while no problems in other dimensions. Meanwhile, 4.7% of the respondents had slight problems in mobility, pain and discomfort but having problems in other dimensions (21121). Whereby, respondents who had experienced of slight problems in mobility, usual activities, pain and discomfort while no problems in self-care and anxiety or depression organized as 21221 were 4.7%.

Our study also revealed that elderly had experienced difficulties in their mobility, self-care and usual activities. Moreover, older respondents also had difficulties in their feeling of pain and discomfort as well as anxiety or depression.

Table 5 EQ-5D-5L health descriptive profiles against gender

EQ-5D DIMENSION		GENDER		TOTAL N (%)
		Female n (%)	Male n (%)	
Mobility	No problems	70 (70.0)	67 (77.9)	137 (73.3)
	Slight problems	23 (23.0)	14 (16.3)	37 (19.9)
	Moderate problems	5 (5.0)	4 (4.7)	9 (4.8)
	Severe problems	1 (1.0)	1 (1.2)	2 (1.1)
	Extreme problems	1 (1.0)	0	1 (0.5)
Self-care	No problems	94 (94.0)	78 (90.7)	172 (92.5)
	Slight problems	3 (3.0)	4 (4.7)	7 (3.8)
	Moderate problems	1 (1.0)	3 (3.5)	4 (2.2)
	Severe problems	2 (2.0)	1 (1.2)	3 (1.60
	Extreme problems	0	0	0
Usual activity	No problems	82 (82.0)	72 (83.7)	154 (82.8)
	Slight problems	15 (15.0)	11 (12.8)	26 (14.0)
	Moderate problems	2 (2.0)	2 (2.3)	4 (2.2)
	Severe problems	1 (1.0)	1 (1.2)	2 (1.1)
	Extreme problems	0	0	0
Pain/ discomfort	No problems	57 (57.0)	57 (66.3)	114 (61.3)
	Slight problems	40 (40.0)	26 (30.2)	66 (35.5)
	Moderate problems	2 (2.0)	3 (3.5)	5 (2.7)
	Severe problems	1 (1.0)	0	1 (0.5)
	Extreme problems	0	0	0
Anxiety/ depression	No problems	90 (90.0)	73 (84.9)	163 (87.6)
	Slight problems	8 (8.0)	11 (12.8)	19 (10.2)
	Moderate problems	1 (1.0)	2 (2.3)	3 (1.6)
	Severe problems	0	0	0
	Extreme problems	1 (1.0)	0	1 (0.5)

Measurement outcome of EQ-VAS

The respond rate for EQ-VAS was 99.5% (190 respondents). The mean of EQ-VAS score was 93 (SD±14) from 100 scaling point. EQ-VAS values were presented in Table 6 with both measures of central tendency and dispersion

Table 6 EQ-VAS values related to gender

EQ-VAS scale	Female	Male
Mean± standard deviation	84±12	82±16
Median	90	85
Inter-quartile range	15	20

DISCUSSIONS

Mass gathering has been associated with infectious diseases and it varies with the type and location of the mass gathering [22]. It also has entails some of the world's most important public health and infections control problems [23, 24]. Usually, pilgrims were vulnerable to different types of diseases normally due to two conditions [25]; first, pilgrims commonly perform *Hajj* and *'Umrah* at their middle or older age. Similarly, most of our respondents were elderly, where the mean of our respondents' age was 55 years old. Therefore, most of them had pre-existing health condition. Those pre-existing health conditions may weaken the immune system of a person. As a consequence, the person is prone to upper respiratory tract infections and other viral infections [17]. Less study was done during *'Umrah* compared to *Hajj*. However, *'Umrah* also very congested, especially three to four months preceding the *Hajj* [23]. Based on the studies conducted during *Hajj*, they found that most of elderly pilgrims age range from 55 to 64 years old were admitted to the hospital [25, 26]. Similarly, the mean age of our respondents were also 55 years old. Even though most of the literatures reviewed were mostly conducted during *Hajj* but, it showed quite similar with our respondents' mean age.

Second condition was, pilgrims exposed to several types of health-related issues. For instance, flu, sore throat, meningitis, and influenza. Meanwhile non-communicable diseases such as cardiovascular were associated to rigorous walking, exhaustion, fatigue, heat and physical trauma [26]. Both older age and co-morbid conditions, especially diabetes and chronic obstructive pulmonary disease may have predisposed the pilgrims to easily have respiratory problems [26]. Most of our respondents (62.3%) did not have any underlying illness before performing *'Umrah*, while the rest (37.7%) claimed to have some form of underlying illness particularly had hypertension (21.5%), diabetes (16.2%) and there were also pilgrims who have both illnesses. Our findings are similar with the research finding by Deris et al., which found diabetes and hypertension were the commonest underlying illnesses among Malaysian who performed *Hajj* in 2010 [27]. Apart from that, al Ghamdi et al. also reported 17.5% of pilgrims had hypertension and 13% had diabetes [26]. Both hypertension and diabetes may be the cause of cardiovascular disease, which commonly cause of death from all over the world [25].

Medications or remedies related to those mentioned diseases were usually brought by the Malaysian pilgrims during their *'Umrah* journey. We have 119 (62.3%) respondents who brought medications from Malaysia despite of having pre-existing illnesses or not. Previous study also reported that 82% of the pilgrims with underlying illness had undertaken their medication regularly [17]. The study from Al-Jasser and colleagues was focus on *Hajj* pilgrims but, we can aware our pilgrims either for *'Umrah* or *Hajj* to always aware in bringing their medicines earlier from Malaysia to avoid from getting ill. Pilgrims with co-morbid health conditions must be very caution about their medications because those co-morbid or underlying illnesses may aggravate pilgrims into serious diseases such as cardiovascular diseases. These had been reported that 24.9% of pilgrims were admitted due to cardiovascular diseases and 8.4% of them caused by hypertension [13]. In addition, at least 39.2% of those admitted during *Hajj* had underlying illnesses [13]. Other than pilgrims with underlying illness, 32.5% from 119 respondents without underlying illnesses were also brought their own medicines to Makkah. Previous study done by Deris et al. reported that 1.3% of Malaysian pilgrims had arthritis and muscle pain when performing *Hajj* in Makkah. Even though it was a small percentage, the prospective pilgrims were advised about the risk of musculoskeletal problems in Makkah. This fact was supported through our result that respondents do had joint pain. Some of them also discovered bringing medicated analgesic oil besides other medications, as a back-up whenever they had this problem due to the physical stress during *'Umrah* rituals. The health status has been measured among respondents using EQ-5D-5L to observe whether they had problems during pilgrimage.

Pain and discomfort was the highest problem experienced by our respondents. It might due to several factors such as air pollutions [28], massive road traffics, intensive construction works, re-suspension of dust particles, and windblown sand and dust particles [29]. These factors may lead pilgrims to feel uncomfortable to do their usual activities and self-care.

In accordance to EQ-5D health status outcome, most pilgrims were noted to have good quality of lives based on the EQ-5D measurement outcomes. However, from the EQ-VAS measurement, the respondents indeed had life difficulties in certain ways during *'Umrah* in Makkah. This was justified by their expression of "not feeling well" and numerically presented by the EQ-VAS mean rating of 83. The contradiction between these measurements was justifiable. Feng and colleagues claimed that the questionnaires presented difficulties and accurately coding the EQ-VAS and the data appeared to yield quite different results if we compared it with the EQ-5D health descriptive outcomes. Perhaps the respondents became more open and felt much easier to respond to the scaling questionnaire like EQ-VAS. As a consequence, the real means of the issue could

easily be captured. The EQ-VAS also might effected by the respondents' age because elder pilgrims have a weak immune system by which cause them having various infection especially respiratory [17]. In addition, pilgrims prone to several health risk due to pollutions and physical exertions from pilgrimage rituals. This can be explained by the EQ-5D health profiles, which the respondents with pre-existing health conditions have problems in their mobility, self-care, usual activities, pain and discomfort, and anxiety or depression. However, there were also respondents who did not have underlying illness but have problems in their EQ-5D health profiles. It was possible for the physical exertion demanded in this pilgrimage added with the crowd and congested conditions [16].

This preliminary report was quite outstanding, because there was no publication on the utilization of EuroQol in measuring the quality of life among pilgrims had been reported elsewhere, particularly in Muslim pilgrims in Makkah. The reliability and accuracy of EuroQol as a measuring tool for the quality of lives of people within the congestion was practical and highly recommended. An advanced analysis will be conducted for more valuable outcome for this study. Later on, this research outcome could be utilized as a reference to various sectors in healthcare provisions and the *Hajj* Management to improve the services for the Malaysian pilgrimage in the future.

CONCLUSIONS

This study has revealed diabetes and hypertension are common non-communicable diseases among pilgrims in Makkah. These illnesses would give burden among pilgrims and therefore, lower down their quality of life. EuroQol was tested and suitable to be used as a measuring tool in determining the quality of life of Malaysian pilgrims in Makkah as it was reliable and also able to determine health problems, especially among the elderly, who had difficulty in expressing their health problems since the feeling of discomfort is a subjective feeling and could not be expressed in an objective way. Therefore, the EQ-5D health problem health profiles and the EQ-VAS visualised scale would be great for measuring the quality of life in this study.

LIMITATIONS

Since data collection was conducted during Ramadhan, respondents had a very tight schedule in Makkah and most of them spent most of their time in the mosque and came back to their room exhaustedly. Therefore, they claimed that they cannot focus on completing our questionnaire. This could explain the 64% response rate.

RECOMMENDATIONS

a) It is recommended to perform data collection during *Hajj* season in order to capture a bigger scope of problems among the *Hujjaj*. Moreover, the *Hajj* season is the peak month for Muslims to perform *Ibadah* to the Almighty. Therefore, overcrowding situation can be expected during this season.

b) It is greatly recommended for the policy maker in *Hajj* management to consider our findings as a fundamental guideline to increase efficiency and improve *Hajj* management quality for Malaysian *Hujjaj* in the future.

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