SHORT REPORT

Quality of life and its association with individual and park characteristics among elderly qi gong practitioners in Malaysia

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ABSTRACT

As life expectancy increases, the Quality of life (QOL) among the elderly becomes an essential topic. This study aimed to determine the QOL and its associating individual and environmental factors among elderly qi gong practitioners in Malaysia. This study utilized a cross-sectional design and a self-administered questionnaire, Google Forms, to measure QOL and its associating factors among elderly respondents from a qi gong association. The EQ-5D questionnaire, IPAQ-M and questions adapted from previously published journal articles were used to collect data from respondents. Data were analyzed using SPSS version 22.0, employing multiple linear regression analysis to determine the significance of the independent variables measured against the QOL among this elderly group. The overall QOL for this group was 0.86±0.10, and this elderly group had a higher QOL when compared to other elderly populations. The multiple linear regression model showed that QOL was positively influenced by moderate physical activity level, with standardised b= 0.33, 95% CI 0.04,0.09, p<0.001 and overall park quality score, with standardised b=0.18, 95% CI 0.001,0.005, p=0.001. On the contrary, QOL was negatively influenced by comorbidity with the standardised b=0.26, 95% CI 0.03,0.07, p>0.001. There is a need to promote senior citizen societies to increase awareness of healthier lifestyles. Senior citizen societies can provide quality care, information, and structured activities for the elderly improving QOL.

Key words: Elderly, environmental, parks, physical activity, quality of life (QOL)

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INTRODUCTION

In 2019, the Department of Statistics Malaysia estimated the Malaysian population to be around 32 million with 10 percent of the elderly. This number is estimated to increase to 15 percent by 2030.[1] This rapid increase is considered to be the fastest rise among developing countries in South East Asia.[2,3]

Gradually, ageing causes degenerative changes in the body causing the elderly to suffer from a multitude of physical and mental impairments. This increases the risks for non-communicable diseases (NCDs), causing disabilities and dependencies, which eventually burden the health care systems and the economy.[4,5] On the contrary, the healthy ageing elderly population can become assets to the community. They can contribute by caring for their grandchildren, performing household chores, involving in voluntary work, and by doing skilled craftsmanships.

World Health Organisation (WHO) and the Centre for Disease Control have shown that physical activities coupled with a supportive environment such as neighbourhood parks may improve the Quality of Life (QOL) among the elderly.[6] WHO revealed that individuals could lower the risks of NCDs with adequate physical activities, increasing the average lifespan by three to five years.[7] One of the commonly practised physical activities among the Asian elderly is qigong. Meta-analysis showed that qigong is able to improve the QOL among the elderly, even among those with chronic diseases.[8-10] In terms of environmental factors, systematic reviews have identified that parks and their characteristics are linked to the increase of QOL among the elderly.[11-15] Unfortunately, studies to determine associating factors to QOL among the elderly are rarely done in Malaysia.

METHODS

This cross-sectional study was conducted from 21st March to 21st July 2021 among elderly respondents aged 60 and above who visited parks in Malaysia within the past six months. The research ethics approval was obtained from the Ethics Committee of Universiti Malaysia Sarawak (Reference Number: RME/21/47). Permission and consent to conduct the study at Infinite Qigong Association of Malaysia (IQAM) were given by the committee members.

IQAM was chosen by using a simple random sampling technique from three elderly societies that fit the inclusion criteria. The sample size was determined using a web-based sample size formula.[16] A confidence limit of 0.05, a prevalence of physically active elderly adults of 70.2% ,[17] and the population of IQAM of 5000[18] were used to calculate the sample size of 303. The respondents were selected through systematic random sampling. A self-administered online survey was used. Sociodemographic characteristics of the respondents were collected: Age, sex, height, weight, ethnicity, marital status, educational level, monthly household income, alcohol use, smoking status and comorbidity.

The International Physical Activity-Malaysia version (IPAQ-M) is an appropriate cultural adaption of the original IPAQ version created by the International Consensus Group.[19] It was used to measure the level of physical activity in this study. IPAQ-M is a reliable and valid tool for measuring physical activity levels in Malaysia.[20] IPAQ-M utilises a seven-day recall period, measuring three domains of physical activity: domestic and gardening activities, employment-related or transportation-related activities, and purposeful exercises. IPAQ-M recorded the total days and hours of these activities.

Using a formula provided by IPAQ, the total days and hours recorded were calculated into a Metabolic Equivalent of Task (MET) minutes per week and categorised into low, moderate, and high physical activity levels.

The EQ-5D-3L questionnaire was used to measure QOL, it was tested by Varatharajan & Chen,[21] who proved it to be reliable and valid for cross-cultural use in Malaysia. The EQ-5D-3L questionnaire measure five dimensions related to QOL on a Likert scale. The five dimensions of QOL are mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. The questionnaire ends with a sixth visual analogue scale (VAS). VAS requires the respondents to describe their level of health of the day; zero represents the worst health and 100 represents the best health. EuroQol provides an evaluation toolkit to calculate a final health *Index Utility Value* (IUV) from the responses. The IUV represents the overall QOL of the respondents; it ranges from the lowest possible score of 0.00, representing death, to a perfect score of 1.00, representing perfect health.[22]

Questions regarding the park characteristics were adapted from a published article by Camargo et al.[23] The questions were: frequency of park use, mode of transportation to parks, park visitations with a companion, and the type of activities performed at the park, park cleanliness, adequate meadows, green areas, trees, adequate walking paths, jogging trails, bicycle routes, adequate lighting, and park safety on a Likert scale. The scores were totalled to obtain a possible maximum overall score of 40 and the lowest possible score of 8. IBM SPSS version 22.0 (licence from Universiti Malaysia Sarawak) was used for statistical analysis.

RESULTS

There were 303 respondents from IQAM. The respondents consisted of 62% females and 38.0% males. The respondents' age range was between 60 to 80 years, with a mean of 65, SD of 3.96. Most were Chinese (97.0%), and the others were Malay (3.0%). More than half completed secondary school (54.1%) while 40.3% completed tertiary education. For household income, 35.0% earned less than RM2500, 26.7% earned between RM2501-RM4849, 22.1% earned RM4850-RM10,959 and 16.2% earned more than RM10,960 per month. Most respondents reported that they have never smoked (92.4%) and never consumed alcohol (71.0%). As many as 47.9% of the respondents reported that they had comorbidities. There were 27.4% categorised into low physical activity level, 34.3% into moderate physical activity level, and 38.3% into high physical activity level (Table 1).

Table 1 Sociodemographic characteristics, health-related profile and physical activity level of the respondents (N=303)

		n	(%)	Mean (SD)
Age (year)		-	-	65 (3.97) Min = 60, Max = 80
Sex	Female	188	62.0	
	Male	115	38.0	
Ethnicity	Chinese	294	97.0	
	Malay	9	3.0	
Marital status	Single	24	7.9	
	Married	268	88.4	

		n	(%)	Mean (SD)
	Divorced/Widowed	11	3.7	
	Up to Primary school	17	5.6	
Education level	Secondary school	164	54.1	
	Tertiary education	122	40.3	
	Less than RM2500	106	35.0	
Monthly household income	RM2501-RM4849	81	26.7	
	RM4850-RM10,959	67	22.1	
	RM10,960 and above	49	16.2	
Health-related profiles				
Smoking status	Non-smoker (Never smoked)	280	92.4%	
	Current Smoker/Previous Smoker	23	7.6%	
Alcohol Use	Non-Drinker (Never used)	215	71.0%	
	Current Drinker/Former Drinker	88	29.0%	
Comorbidity[1]	Yes	145	47.9%	
Physical activity level measured by IPAQ-M				
		Median (IQR) MET-minutes per week		n(%)
Domain 1: Leisure		1801.80 (990-2772)		-
Domain 2: Moderate Activity		1680.00 (480-3360)		-
Domain 3: Vigorous Activity		216.00(0-864)		-
Total Physical Activity		4068.00(2350.8-7038)		-
Physical Activity Level				
Low		-		83(27.4%)
Moderate		-		104(34.3%)
High		-		116(38.3%)

[1] *Comorbidity: Yes = living with any form of comorbidity presently; hypertension, diabetes, cancers, chronic lung disease (COPD, Asthma).*

The overall mean score for parks was 30.37. Characteristics of the park revealed that majority (88.8%) used the parks at least once a week, and the rest visited the parks less than once per week. Most respondents used transportation to the parks (87.2%) and the rest (22.8%) walked. As many as 63.0% took less than 10 minutes to get to a park, while the rest (37.0%) took more than 10 minutes. The data also shows that 73.9% visited the parks with companions, and 30.7% used the parks for active use. The IUV for the respondents was 0.86 (Table 2).

Table 2 Park quality, mean and overall score, characteristics of park use and the EQ-5D quality of life utility value (N=303)

	Mean Score (SD)	Mean overall score (SD)
Park Cleanliness	3.94 (0.84)	30.37 (5.97)
Adequate Greenery	4.17 (0.89)	Min = 10.00
Adequate Trees	4.15 (0.86)	Max = 40.00
Adequate Walk Paths	4.07 (0.92)	

	Mean Score (SD)	Mean overall score (SD)
Adequate Jogging Trails	3.93 (1.04)	
Adequate Bicycle Trails	2.64 (1.37)	
Adequate Lighting	3.53 (1.14)	
Safety	3.94 (0.89)	
Characteristics of park use		
		n(%)
Park visit frequency	Less than once in the past six months	14(4.6)
	Less than once a week	20(6.6)
	At least once a week	269(88.8)
Walking as a mode of transport to parks	Walking	69(22.8)
The duration it takes to go to a park	0-10	191(63.0)
	>10	112(37.0)
Visits park with companion	Yes	224(73.9)
Park use[1]	Passive	210(69.3)
	Active	93(30.7)
Index utility value		
		Mean (SD)
Index utility value[2]		0.86 (0.10)
		Min = 0.50
		Max = 1.00

[1]Park use: Passive = park activities that do not make the individual breathe harder than normal. Active = park activities that make the individual breathe harder than normal.
[2] Index utility value (IUV) represents the overall QOL. 0=worst possible health/dead, 1.00=perfect health

In the univariate analysis, the significant variables were comorbidity, physical activity level, overall park quality score and park visit frequency ($p<0.05$). These variables were used in the regression analysis to identify the predictors of QOL (Table 3).

Table 3 Relationship between observed variables and the quality of life utility value (N=303)

	EQ-5D Utility Value Adjusted Mean (95% CI)[123]	p-value
Sociodemographic Profile		
Sex[1]		
Male	0.87 (0.72, 0.90)	0.48
Female	0.86 (0.76, 0.96)	
Age[2]		
r-value	-0.99	0.09
Ethnicity[1]		
Chinese	0.86 (0.76, 0.96)	0.12
Malay	0.81 (0.72, 0.90)	
Marital Status[3]		
Single	0.86 (0.77,0.95)	
Married	0.86 (0.76,0.96)	0.957
Divorced/Widowed	0.85 (0.73,0.97)	

	EQ-5D Utility Value Adjusted Mean (95% CI)[123]	p-value
p-value		
Education Level[3]		
Primary	0.84 (0.76,0.92)	
Secondary	0.87 (0.77,0.97)	0.73
Tertiary	0.85 (0.75,0.95)	
No formal education	0.85 (0.71, 0.99)	
Monthly household income[3]		
Less than RM 2500	0.86 (0.77,0.97)	
RM2501-RM4849	0.84 (0.74,0.94)	0.06
RM4850-RM10,959	0.87 (0.78,0.96)	
RM10,960 and above	0.87 (0.78,0.96)	
Health related profile		
Smoking status[1]		
Non-smoker (Never smoked)	0.86 (0.76,0.96)	
Current Smoker/Previous Smoker	0.86 (0.76,0.96)	0.83
Alcohol use[1]		
Non-Drinker (Never used)	0.86 (0.76,0.96)	0.48
Current Drinker/Former Drinker	0.87 (0.78,0.96)	
Comorbidity[1]		
Yes	0.83 (0.72,0.94)	<0.01
No	0.89 (0.74,0.91)	
Physical Activity Level[3]		
Low	0.83 (0.76,0.90)	
Moderate	0.90 (0.81,0.99)	<0.001
High	0.85 (0.74,0.96)	
Overall park quality score[2]		
r-value	0.17	0.004
Park Use Profile		
Park visit frequency[3]		
Less than once in the past six months	0.81 (0.69,0.93)	
Less than once per week	0.79 (0.68,0.90)	0.001
At least once a week	0.87 (0.78,0.96)	
Walking as a transport to parks[1]		
Walking	0.86 (0.77,0.96)	0.98
Not walking	0.86 (0.76,0.96)	
Duration it takes to go to park[1]		
10 minutes or less	0.86 (0.77,0.95)	0.46
>10 minutes	0.85 (0.76,0.96)	
Visits Park with companion[1]		
Yes	0.86 (0.76,0.96)	0.51
No	0.85 (0.75,0.95)	
Park use[1]		
Passive use	0.86 (0.758,0.96)	0.81

	EQ-5D Utility Value Adjusted Mean (95% CI)[123]	p-value
Active use	0.86 (0.77,0.95)	

[1] Independent t-test, [2]Pearson's correlation, [3]one -way ANOVA.
Post-hoc comparison (not tabulated): Low physical activity vs Moderate physical activity p<0.001, Low physical activity vs High physical activity p=0.1.4, Moderate physical activity vs High physical activity p=0.001.

The multiple linear regression results showed that comorbidities, moderate physical activity level and overall park quality score were statistically significant, while high physical activity level and frequency of park visits were not statistically significant (Table 4).

Table 4 Regression models for factors associated with quality of life utility value (N=303)

Variables	Simple Linear Regression			Multiple Linear Regression			
	b	95% CI	p-value	Standardised b	95% CI	t-Statistic	p-value
Comorbidity	-0.56	-0.80,-0.32	<.001	-0.26	-0.071,-0.03	-4.78	<.001
Physical activity level							
Low	-	-	-	-	-	-	-
Moderate	0.68	0.04,0.10	<0.001	0.33	0.043,0.094	5.22	<.001
High	0.02	-0.01,0.05	0.144	0.09	-0.007,0.098	1.43	0.15
Park visit frequency							
less than once in the past six months	-	-	-	-	-	-	-
Less than once a week	0.05	-0.01,0.10	0.122	0.20	-0.09,-0.007	1.70	0.09
More than once a week	0.052	-0.001,0.11	0.06	0.22	-0.001,0.096	1.91	0.06
Overall park quality score	0.003	0.001,0.005	0.004	0.18	0.01,0.05	3.50	0.001

The final regression model was adjusted with age, sex, and ethnicity. Adjusted R^2=0.194. The model fits reasonably well. No redundancy was seen for the multicollinearity. The variance inflation factor (VIF) for the variables of interest was not more than 5. Model assumptions were met. For simple linear regression, low physical activity level and park visit less than once were used as a reference in the past six months. For multiple linear regression, low physical activity level and no park visits were used as references.

DISCUSSION

In this study, the respondents' age range was between 60 to 80 years old, with a mean age of 65. As many as 62.0% were females. This finding was expected as published articles showed that females are more health-conscious throughout their lives, shying away from higher-risk activities, choosing better diets and participating in health-promoting activities[24,25] Furthermore, qigong is a physical activity related to traditional Chinese culture, which explains why the majority of the participants were Chinese (97%). Moreover, this study has added age, sex and ethnicity into the final regression model to be adjusted as confounding factors. The significant factors predicting IUV remained unchanged after the adjustment. However, this study could not test those assumptions further. More studies should be conducted to find the associations between age, sex, ethnicity, health consciousness and participation in health-promoting groups such as qigong.

This study group consists of 6% smokers, and 29.0% alcohol consumers. The percentage of smokers was lower than the percentage of smokers in the Malaysian population (12.4%) but the percentage of alcohol consumers was higher than the number of alcohol consumers in the national population (23.1%).[26] This study group participated in health-promoting physical activities and was more aware of the high-risk behaviours. This can explain the lower prevalence of smokers among this study group. The higher prevalence of alcohol consumption can be attributed to the ethnic distribution, consisting mainly of Chinese respondents. On the other hand, a large percentage of Malaysians are Malay Muslims, and alcohol consumption is forbidden in Islam, which explains why the national percentage of alcohol consumers is lower. Comorbidity among this group was 47.9%. As comorbidities are common among the elderly group, to describe the specific commodities in this study group was beyond the scope of the objective. The 2019 National Health and Morbidity Survey[26] reported the prevalence of diabetes, hypertension and dyslipidaemia are 27.7%, 51.5% and 41.8%, respectively, and this sample group had comorbidities similar to the general population.

Percentages of participants in low, moderate, and high physical activity levels were 27.4%, 34.3% and 38.3%, respectively. The National Health & Morbidity Survey[26] in 2019 published that 40.2% of the elderly had low physical activity levels and 59.8% had moderate to high physical activity levels. This study group had higher physical activity levels compared to the Malaysian elderly population. This was also anticipated, considering that the study group was associated with a health-conscious group.

The study group was moderately satisfied with the park quality. The only item that scored below satisfactory level was the availability of bicycle trails. Hence, this study has identified the need to improve the availability of bicycle trails in parks of Malaysia. This study did not specify which parks had low overall quality which required improvements as identifying parks with poor quality was not part of the objective.

Most respondents visited parks at least once a week (88.8%), and 63.0% took 0 to 10 minutes to go to the park. Most of the participants used modes of transportation other than walking, preferred to visit the park with a companion (73.9%), and used parks for passive leisure activities (69.3%). These findings were expected as the respondents planned physical activities at the parks as part of their association's activity.

The IUV was 0.86±0.10. This result was higher than a published article by Marten and Greiner.[27] They sampled 1000 respondents among German elderly who were not affiliated with groups organised

for physical activity. Marten and Greiner[27] obtained IUV of 0.84±0.22. The German elderly group had a mean age of 73.1±5.7, and 47.0% experienced illness. This higher IUV was anticipated as published articles from WHO have shown that those with some form of physical activities have reduced risk for non-communicable diseases and increased benefits compared to those who are sedentary.[28] However, only those categorised with moderate physical activity levels showed a statistically significant increase in the IUV among the elderly.

Comorbidity had a standardised b=-0.24, 95% CI -0.75, -0.288, p <0.001. This predicted that a person without comorbidities will have a higher IUV. This result was anticipated; similar results were published by Wong et al. (29), a population-based study in Hong Kong, SAR, China. Wong et al. [29] reported a standardised b= −0.023 and p-value=0.01, similarly predicting that those without comorbidities will score better IUV when compared to those with comorbidity.

Those with moderate physical activity levels had a significant positive predictive value towards the IUV, with a standardised b=0.32, 95% CI 0.45,1.03, p<.001. There were mixed published results regarding physical activity level and its influence on QOL. Some examples from Prasad et al.[30] and Puciato et al. [31] revealed that elderly with higher physical activity levels have a higher IUV. Alternatively, an experimental study conducted by Fernandez-Alonso et al. [32] excluded elderly with high physical activity levels from their study. The authors discussed the possibility of an increased risk of falls as activity level increases. Fernandez-Alonso et al. had similar results; IUV of 0.86±0.15 and 0.78±0.22 for moderate and low physical activity levels, respectively, indicating that those with moderate physical activity levels had a better QOL than those with low activity levels. However, both categories of physical activity levels were not statistically significant in their multiple regression models. Additional qualitative studies can be conducted to understand why elderly groups participate in physical activities. Possibly, higher level of physical activities could negatively affect a balanced lifestyle, reducing time spent with friends and family or performing hobbies. These components were published as health-related factors that affect the overall QOL.[33]

Park quality had a standardised b=0.17, 95% CI 0.01,0.05, p=0.001. This indicated that the park quality significantly influences the QOL. This result was anticipated as published articles from Camargo et al.[23] and Khalid et al.,[34] acknowledged that park quality significantly influences the overall QOL, predicting that better park quality leads to a better QOL.

While conducting this study, some limitations were identified. Firstly, the respondents are members of a health orientated association, thus, they might have responded based on the socially acceptable answers. Their responses might also be biased as they may overreport their physical activity level. This may justify the insignificant influence of high physical activity level and QOL. Secondly, further qualitative studies can be conducted to identify other intangible dimensions of QOL: wellness, happiness, or spiritual enlightenment. This can help to explain why high physical activity level was not significantly affecting QOL among certain study groups.

CONCLUSION

Comorbidity, moderate physical activity level and park quality remained as significant predictors of QOL throughout the analysis. Moderate physical activity level had the highest positive predictive

value, while the presence of comorbidity had the highest negative predictive value.

More research is needed to establish the overall QOL of the elderly in Malaysia and to identify factors influencing the QOL among the general elderly population in Malaysia. Population study can benefit researchers as it will establish a baseline for future studies to compare and evaluate health interventions using the baseline as a reference.

This study proved that QOL is affected by environmental factors, community action and individual behaviours to participate in physical activities by taking charge of their own health. This study has uncovered that there were not many social clubs catered for the elderly. Mainstream social clubs, like IQAM, were observed to be ethnically biased due to the nature of the physical activities performed. This highlights the need to increase awareness of other societies, such as the *Pusat Aktiviti Warga Emas (PAWE). PAWE* can provide quality care, information, and structured activities for the elderly irrespective of ethnicities or preferences. As for now, *PAWE* is yet to be fully utilised by Malaysian senior citizens.[35]

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