

Physical Activity, Enjoyment and Quality of Life among Institutionalised Older Adults in Malaysia: A Cross-Sectional Study

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ABSTRACT

Purpose: *In many nations across the world it has become a priority to stimulate increased physical activity (PA) among elderly persons. This study aimed to find the association between physical activity patterns and enjoyment of physical activity and health-related quality of life (HRQoL) among institutionalised older adults in Malaysia.*

Method: *A sample of institutionalised older adults (n=134, mean age = 73.72; SD = 8.59) was recruited from the Klang valley in Malaysia. In cross-sectional analyses, their physical activity, enjoyment of physical activity and quality of life were screened using the Physical Activity Scale for the Elderly, the 8-item Physical Activity Enjoyment Scale and the EuroQuol-5 Dimensions-5 Levels questionnaires, respectively. High levels of physical activity were associated with enjoyment of physical activity and health-related quality of life.*

Results: *In total, 41% of the participants met the guidelines of the Physical Activity Scale for the Elderly and 53% enjoyed physical activity. A positive correlation was found between the level of physical activity and its enjoyment ($r_s = .355, p < .001$). Significant correlations were recorded between the dimensions of health-related quality of life and the level of physical activity ($p < 0.001$), except for pain/discomfort and anxiety/depression.*

Conclusion: *Providing opportunities for institutionalised older adults to engage in a variety of activities might help them to identify the kind of physical activity they enjoy and facilitate a lifelong physical activity routine.*

Key words: *physical activity, older adults, enjoyment of physical activity, health-related quality of life.*

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INTRODUCTION

The global population of older adults aged 60 years and above is 962 million and is expected to reach 2.1 billion by 2050; whereas in Asia, older adults account for around a quarter of the population (United Nations, 2017). In Malaysia, older adults represented 6% of the total population in 2016 and are estimated to comprise 15% of the Malaysian population by 2050 (Onunkwor et al, 2016). The social characteristics of people in Malaysia are changing as a result of urbanisation and modernisation. The extended family structure is being replaced by a nuclear family structure, and this in turn is putting a strain on the family in its role as caregiver for older adults with declining health conditions. Consequently the demand for care options for elderly people is on the rise.

Participation in physical activity (PA) promotes healthy ageing and plays an important role in improving quality of life (QoL) among the elderly. Quality of life is related to an individual's perception of one's position in life in the context of culture and value systems, and is influenced in a complex way by the person's physical health, psychological state, level of independence, and social relationships. Health-related quality of life (HRQoL) is part of a multidimensional approach that considers physical, mental, and social aspects (Vagetti et al, 2014). Previous studies have pointed at the poor quality of life amongst older people in nursing homes or elderly institutions (Bodur et al, 2009). By assessing the health-related quality of life, researchers are able to investigate the influencing factors and, subsequently, design interventions to improve it.

Enjoyment is both a predictor and outcome of physical activity participation (Dacey et al, 2008). Expected enjoyment from physical activities can increase exercise intentions and the mere anticipation of positive emotions predicts physical activity adoption and maintenance (Ruby et al, 2011). Opportunities for the elderly to engage in and enjoy a variety of physical activities could be important factors that lead to increasing participation in physical activity. Little is known about the way in which enjoyment of physical activity is fostered among institutionalised older adults. Addressing these research gaps would assist in the development of policies and practices aimed at increasing physical activity levels among institutionalised older adults. It would also drive the design of programmes to promote enjoyment and participation in physical activity among the elderly.

The documented low rates of physical activity among older adults have spurred on research efforts to better understand how exercise participation can

be maximised. Participation in physical activity and exercise can contribute to maintaining quality of life, health, and physical function and reducing falls among older people in general and older people with morbidities in particular (Tricco et al, 2017). To this end, several studies have been conducted to synthesise information regarding the relationship between physical activity and the domains of mental health and quality of life among older adults (Halaweh et al, 2015; Oh et al, 2017; Miranda et al, 2016).

Objective

With the number of elderly people in institutions steadily increasing, this study aimed to examine the associations between physical activity, the enjoyment of physical activity and health-related quality of life among a sample of institutionalised older adults in Malaysia.

METHOD

Study Design

A cross-sectional design was adopted to study physical activity and its associations with enjoyment and health-related quality of life.

Study Sample

The participants were selected by the convenient sampling method. They consisted of 134 older adults living in care homes in Klang Valley, the central region of Peninsular Malaysia. They were all around 60 years of age or older, with a mean age of 73.72 years (SD = 8.59). Among them, 76 were females (56.7%) and 58 were males (43.3%).

Inclusion criteria:

- Those who were 60 years or older, living in elderly care homes;
- Able to walk independently; and,
- Able to understand written and oral information in the English language.

Exclusion criteria:

- Those with cognitive impairment as per the Mini-Mental State Examination (MMSE); and,

- Those undergoing regular physical therapy treatment or being in terminal care.
- Informed consent was obtained from all participants. The participants received no compensation for their involvement in the study.

Data Collection and Measurements

Socio-demographic characteristics included gender, age, race, marital and economic status, level of education, comorbidities, and use of assistive devices.

Physical activity assessment

The Physical Activity Scale for the Elderly (PASE) was used. PASE is an interviewer or self-administered recall questionnaire designed to assess physical activity among older adults. The PASE score is derived from predetermined weights and frequency values for each of the 12 activity items. Scores range from 0 to 400. The tool is designed to assess household, occupational and leisure activity items. An earlier study (Washburn et al, 1993) showed that PASE is a trustworthy tool for the evaluation of physical activity in older adults.

Health-related quality of life assessment

The EQ-5D-5L version was used to measure quality of life among the elderly in this study. In October 2018, permission was obtained from the EuroQoL group to use the instrument. The EQ-

5D-5L is a standardised, non-disease specific instrument developed for describing and valuing health-related quality of life. The EQ-5D-5L has been described as a valid and reliable instrument to assess HRQoL in different populations (Obradovic et al, 2013). It consists of a descriptive system and the EQ visual analogue scale (EQ-VAS). The descriptive system includes five dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression), and each dimension includes five levels of coding: 1 = no problems; 2 = slight problems; 3 = moderate problems; 4 = severe problems; and 5 = extreme problems.

Physical activity enjoyment assessment

The Physical Activity Enjoyment Scale-8 (PACES-8) was used. Respondents were asked to rate "How you feel at the moment about the physical activity you have been doing", using a 7-point bipolar rating scale. Two items are reverse scored. Higher PACES scores reflect greater levels of enjoyment. PACES-8 was found to

have a high convergent validity with the original PACES questionnaire strongly correlated with PACES-18 at 0.98 (Mullen et al, 2013).

Statistical Analyses

The collected data was electronically stored and analysed using the Statistics Package for the Social Sciences (SPSS) version 23.0. The socio-demographic information of the participants was analysed using descriptive statistics to determine the frequency of the respective distributions. Simple percentage analysis was used to determine the prevalence of participants who were physically active and prevalence of participants who enjoyed physical activity. Spearman's rank-order correlation was used to determine the correlation between physical activity level and enjoyment, and the correlation between physical activity level and health-related quality of life. The Mann-Whitney U Test was used to investigate the association of physical activity level with gender. The Kruskal-Wallis Test was used to investigate the association of physical activity levels with marital status, level of education, number of chronic comorbidities, number of assistive devices used, and economic status of the participants.

Ethics

The study was approved by the Scientific and Ethical Review Committee of Universiti Tunku Abdul Rahman, Malaysia (Re: U/SERC/150/2018). The researchers were guided by the 1964 Helsinki Declaration, which concerns human rights, informed consent, and correct procedures in research involving human participants.

RESULTS

The study was conducted from October to December 2018. Among the institutionalised older people who were eligible to participate, 12 declined for various reasons and the remaining 134 adults were included in the survey. The majority of the participants were single, followed by those who had been widowed, were married, or were divorced. The demographic profile of the participants is given in Table 1.

Table 1: Demographic Characteristics of the Participants

Variable	N	%
Gender		
Male	58	43.3
Female	76	56.7
Ethnicity		
Malay	1	0.7
Chinese	111	82.8
Indian	22	16.4
Others	0	0
Level of Education		
None	28	20.9
Primary	53	39.6
Secondary	48	35.8
Tertiary	5	3.7
Marital Status		
Single	62	46.3
Married	24	17.9
Divorced	11	8.2
Widowed	37	27.6
Economic Status		
Poor	46	34.3
Intermediate	83	61.9
Good	5	3.7
Chronic Comorbidity		
None	36	26.9
One	28	20.9
Two	35	26.1

Variable	N	%
More than two	35	26.1
No. of Assistive Devices		
None	57	42.5
One	63	47.0
Two	12	9.0
More than two	2	1.5

Health-related Quality of Life - HRQoL

The frequency of participants, according to the levels of health status (HRQoL) of each domain in EQ-5D-5L is shown in Table 2. In the mobility domain, 40.3% of the participants reported they had no problems with mobility, whereas 59.7% reported mobility problems ranging from slight problem to inability to walk. In the self-care domain, 76.9% of the participants reported no problem with self-care. In the usual activity domain, 58.2% reported no problem. Less than half of the participants (47.8%) in this study reported that they had no pain or discomfort, 28.4% had slight pain or discomfort, 16.4% reported moderate pain or discomfort, and the rest reported severe pain or discomfort. None of the study participants reported extreme pain or discomfort. Lastly, in the anxiety/depression domain, 52.2% of the participants reported that they had no anxiety or depression, followed by 28.4% with slight anxiety or depression, and 14.9% with moderate anxiety or depression. None of the study participants reported extreme anxiety or depression. The mean EQ-VAS score of the participants was 67.37 with SD = 23.827.

Table 2: Frequency of Health Status in Domains of HRQoL

	Frequency (N)	Percentage (%)
Mobility		
No problem	54	40.3
Slight problem	26	19.4
Moderate problem	31	23.1
Severe problem	9	6.7

	Frequency (N)	Percentage (%)
Unable to walk	14	10.4
Self-care		
No problem	103	76.9
Slight problem	10	7.5
Moderate problem	12	9.0
Severe problem	4	3.0
Unable to wash or dress	5	3.7
Usual Activity		
No problem	78	58.2
Slight problem	32	23.9
Moderate problem	18	13.4
Severe problem	3	2.2
Unable to do usual activity	3	2.2
Pain or Discomfort		
No pain or discomfort	64	47.8
Slight pain or discomfort	38	28.4
Moderate pain or discomfort	22	16.4
Severe pain or discomfort	10	7.5
Extreme pain or discomfort	0	0
Anxiety or Depression		
Not anxious or depressed	70	52.2
Slightly anxious or depressed	38	28.4
Moderately anxious or depressed	20	14.9
Severely anxious or depressed	6	4.5
Extremely anxious or depressed	0	0
EQ VAS (mean, SD)	67.37 (23.827)	

HRQoL = Health-Related Quality of Life.

Physical Activity and Health-related Quality of Life

The health status of participants from the domains of health-related quality of life according to the level of physical activity is shown in Table 3. In the mobility domain, those who reported no problems featured more in the physically active group (54.4%) than in the inactive group (20.0%). Those who reported problems ranging from slight to severe difficulty to walk made up 45.6% of the active group and 80.0% of the inactive group. In the self-care domain, participants who reported no problem made up 83.5% of the active group, and 67.3% of the inactive group. Participants who reported problems ranging from slight to severe, and even inability to perform self-care, represented 16.5% in the active group while the proportion in the inactive group was as high as 32.7%. In the usual activity domain, 73.4% in the active group reported no problem and in the inactive group only 36.4% had no problem. Among those who reported with problems ranging from slight to extreme, 26.6% were in the active group and 63.6% were in the inactive group. In the pain or discomfort domain, the active group had a higher proportion of 53.2% than the inactive group with 40.0%. Those who reported with slight to extreme pain in the active group were only 46.8% whereas in the inactive group 60.0% reported the same. More than half of the participants or 55.7% in the active group reported that they had no anxiety or depression, whereas the proportion in the inactive group was 47.3%. The active group also reported higher scores in EQ-VAS, with a mean score of 71.76 with SD = 23.528, whereas the inactive group had a lower mean score at 61.05 with SD = 23.019.

Table 3: Frequency of Health Status from Domains of HRQoL according to Level of Physical Activity

HRQoL	Active		Inactive	
	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
Mobility				
No problem	43	54.4	11	20.0
Slight problem	18	22.8	8	14.5
Moderate problem	12	15.2	19	34.5
Severe problem	3	3.8	6	10.9
Unable to walk	3	3.8	11	20.0

	Active		Inactive	
Self-care				
No problem	66	83.5	37	67.3
Slight problem	4	5.1	6	10.9
Moderate problem	5	6.3	7	12.7
Severe problem	3	3.8	1	1.8
Unable to wash or dress	1	1.3	4	7.3
Usual activity				
No problem	58	73.4	20	36.4
Slight problem	12	15.2	20	36.4
Moderate problem	7	8.9	11	20.0
Severe problem	2	2.5	1	1.8
Unable to do usual activity	2	3.4	3	5.5
Pain or Discomfort				
No pain or discomfort	42	53.2	22	40.0
Slight pain or discomfort	23	29.1	15	27.3
Moderate pain or discomfort	8	10.1	14	25.5
Severe pain or discomfort	6	7.6	4	7.3
Extreme pain or discomfort	0	0	0	0
Anxiety or Depression				
Not anxious or depressed	44	55.7	26	47.3
Slightly anxious or depressed	24	30.4	14	25.5
Moderately anxious or depressed	9	11.4	11	20.0

	Active		Inactive	
Severely anxious or depressed	2	2.5	4	7.3
Extremely anxious or depressed	0	0	0	0
EQ VAS (mean, SD)	71.76 (23.528)		61.05 (23.019)	

HRQoL = Health-Related Quality of Life.

Physical Activity and Enjoyment of Physical Activity

While 71 participants (53%) reported that they enjoyed participation in physical activity, 63 (47%) did not enjoy it. Among the participants, 55 (41%) were found to be physically active while 79 (59%) were reportedly inactive. A moderate positive correlation between the two variables ($r_s = 0.355$ $n = 134$, $p = <0.001$) is shown in Table 4. Enjoyment was reported to be high among participants who engaged in satisfactory levels of physical activity.

Table 4: Correlation between Level of Physical Activity and Enjoyment of Physical Activity

	Mean (SD)	N	<i>r</i>	<i>p</i> value
PASE	35.11 (36.933)	134	0.355**	<0.001
Enjoyment of PA	34.06 (12.374)			

**Spearman Rank correlation analysis was performed, level of significance at $p < 0.01$ level (2-tailed), r_s is correlation coefficient

Analysis of the Level of Physical Activity with different Variables

Association between the physical activity level and associated factors is shown in Table 5. A negative correlation was found between age and physical activity ($r_s = -0.231$, $N = 134$, $p = .007$), meaning that higher age was associated with lower levels of physical activity. Participants who were single had a higher level of physical activity (33.60, IQR 51) than those who were widowed (9.89, IQR 11). On comparing activity levels of those who were divorced with those who were widowed, it was found that divorcees had a higher level of physical activity (37.90, IQR 46). There was no statistically significant difference in the levels of physical activity between persons who were single vs. married, single vs. divorced, married vs.

divorced, and married vs. widowed. On analysis of the association between level of education and physical activity, no statistically significant difference was found in the level of physical activity for the four categories of level of education ($\chi^2(3) = 4.016, p = 0.260$). Participants who did not use any assistive device showed a significantly higher level of physical activity (44.72, IQR 60) in comparison to those who used one assistive device (14.35, IQR 23).

Table 5: Association between Physical Activity Level and Associated Factors

Variables		N	Physical Activity Level Median Rank	K ^a	p-value ^a
Marital Status	Single	62	79.54	17.028	.001*
	Married	24	60.15		
	Divorced	11	80.14		
	Widowed	37	48.34		
Education	None	28	77.34	4.016	.260
	Primary	53	62.76		
	Secondary	58	64.99		
	Tertiary	5	86.70		
Number of Chronic Comorbidities	None	36	78.04	4.063	.255
	One	28	62.29		
	Two	35	61.30		
	> two	35	67.03		
Number of Assistive Devices used	None	57	85.37	21.087	< .001*
	One	63	53.93		
	Two	12	56.38		
	> two	2	52.50		
Economic Status	Poor	46	65.14	1.882	.390
	Intermediate	83	67.44		
	Good	5	90.20		

^aKruskal Wallis Test, * statistically significant results, significant level < 0.05.

Post hoc analysis with Bonferroni's correction on marital status and showed those who were single vs. married, $p = .124$, those who were single vs. divorced, $p = 3.56$, those who were single vs. widowed, $p < .05$, those who were married vs. divorced, $p = .52$, those who were married vs. widowed, $p = .74$, those were divorced vs. widowed, $p = .04$.

Post hoc with Bonferroni's correction on number of assistive devices and showed those who did not use assistive device vs. one assistive device, $p < .001$, those who did not use assistive device vs. two assistive devices, $p = .068$, those who did not use assistive device vs. more than two assistive devices, $p = 1.104$, those who used one vs. two assistive devices, $p = 3.268$, those who used one vs. more than two assistive devices, $p = 3.576$, those who used two vs. more than two assistive devices, $p = 3.708$.

DISCUSSION

One of the main findings in this study was that more than half of the participants did not achieve the recommended level of physical activity. Factors like age, marital status and number of assistive devices used by the participants were found to be associated with the level of physical activity. In addition, enjoyment of physical activity and health-related quality of life were found to be moderately correlated with physical activity. A little more than half of the participants enjoyed physical activity, and those who were physically active were found to have better health-related quality of life.

Several studies have reported that persons who lived in care homes had lower physical activity levels than community-dwelling older adults. In an earlier study (Burton et al, 2013), most of the participants were community-dwelling individuals who had met the recommendation of physical activity and had higher mean PASE scores. A recent study conducted among community dwelling older adults in Malaysia reported that the prevalence of physical inactivity was as high as 88% (Kaur et al, 2015). The ethnic minority in that study demonstrated the highest prevalence of physical inactivity, thereby showing higher values as compared to the current study. However, compared to a study conducted among community dwelling and institutionalised older adults in South Africa (Ramocho et al, 2017), PASE scores for this study were higher. This may be due to the difference in the type of institutions included, as the participants recruited were only from old age homes, whereas in the current study, participants were recruited from all types of institutions, for instance, old age homes, nursing homes and retirement homes. Besides, they also reported that the physical activity level of community-dwelling older adults was much higher than that of the institutionalised older adults.

Practising an active lifestyle is important for healthy ageing. Therefore, physical activities of moderate intensity, for example walking, should be encouraged among older adults, as these types of activities have been associated with lower risk of morbidity and mortality, as well as functional dependence (Chou et al, 2014). According to the Australian Bureau of Statistics (2011), walking is the most prevalent form of physical activity. Walking for at least 5 days a week was associated with lower risk of physical impairment especially in the mobility domain (Roh et al, 2013). According to Ganse et al (2014), vigorous physical activities will not place higher risks on older adults accustomed to physical activity of similar intensity, as compared to their younger counterparts. Besides, to tackle

the impacts of reduced muscle mass and sarcopenia which were associated with mobility impairment among older adults, strengthening exercises of moderate and high intensity were encouraged to gain strength and power (Maden-Wilkinson et al, 2013). In addition, physical activity helps to control blood pressure and cholesterol, increasing oxidation of fatty acid in skeletal muscles, and thus helps to reduce the risks of various non-communicable diseases (Roberts et al, 2013). Improvement in the nervous system has been shown to help in maintaining cognitive function and might improve balance and coordination through an increasing number of peripheral motor neurons that control the muscles of lower limbs (Power et al, 2010).

According to the findings of the study conducted by Yasunaga et al (2008), physical activity and age are negatively associated, i.e., as individuals grow older, they tend to decrease participation in physical activity. This supports the result obtained in the current study. Kaur et al (2015) also reported that among older adults, 65 years of age and above, the risk of becoming physically inactive increases as they limit their physical activity. The findings of this study are in accord with the findings of Burton et al (2013) which highlighted that physical activity at younger age is the best factor to predict physical activity levels of older adults in care homes. Inactivity might be due to the ageing process and physical degeneration that leads to more chronic comorbidities and chronic pain, which in turn further leads to a misconception that rest and inactivity are the treatment choice to tackle these chronic conditions (Geneen et al, 2017). In this study, more than 70% of the participants reported that they had one or more chronic comorbidities, and they could be harbouring the same misconception.

Educational level was found to be not statistically significant in relation to the level of physical activity. In a study conducted by Krol-Zielinska et al (2011), no significant association was reported between educational level and physical activity among women living in institutions and women living in the community. On the other hand, in the current study, marital status was found to be statistically significant in relation to the level of physical activity. Unmarried and divorced older adults were found to have a significantly higher level of physical activity in comparison to older adults who were widowed. A study by Sobal and Hanson (2010) reported similar findings among middle-aged adults. In their study, widowed participants were found to be more sedentary, i.e., the tendency to sit was higher than to stand or walk, whereas those who were single or divorced were highly active. This population might also have maintained their earlier

habits, since lifestyle habits at a younger age have been shown to influence the current lifestyle of older adults (Franco et al, 2015).

In this study, a number of chronic comorbidities were found to be not statistically significant with regard to physical activity levels. This is in contrast to the conclusions arrived at in a systematic review by Franco et al (2015) and a study by Ashe et al (2009), which found that existing comorbidities of the older adults were a barrier to physical activity. However, the barrier due to chronic comorbidities can be overcome by practising the physical activity that is particularly suitable for them. As suggested by Chen (2010), mild forms of physical activity, for example, stretching and strengthening exercises, wheelchair exercises and an active range of motion exercises, may be easily performed by older adults with certain types of impairments. This finding has suggested the possibility that the level of physical activity is not limited by chronic comorbidities, causing these two variables to be not significantly associated in the current study. Franco et al (2015) also highlighted that some older adults who had chronic conditions remained physically active despite their problems, as a means to tackle and control their conditions.

In addition, the use of a number of assistive devices showed a negative correlation with the level of physical activity. The reason could be that there was a reduction in the level of physical activity by older adults due to their physical limitations. Fear of falling and lack of self-confidence may have been responsible. As stated by Franco et al (2015), the participants reported that physical activity increased the risk of injury because of their frail condition, especially for those who had fallen earlier. As seen in this study, the use of a larger number of assistive devices was suggestive of greater frailty, making the elderly more fearful of getting injured through participation in physical activity. The same systematic review (Franco et al, 2015) also mentioned that self-confidence was another factor associated with physical activity as it was related to a sense of competence that encourages the older adults to perform and continue physical activity. Apart from the possible determinants discussed in this study, there are various other factors that affect the levels of physical activity. For example, psychological issues like depression (Burton et al, 2013) and social support (Pernambuco et al, 2011) may also have an effect. However this study has not explored these issues.

A study by Gray et al (2016) highlighted the complexity of participation in physical activity by older adults since various environmental, psychological,

physical and social factors play a part. However, the authors emphasised that autonomous motivation has a strong influence and can be achieved by fostering enjoyment of physical activity. According to a study conducted by Hagberg et al (2008), enjoyment of physical activity was a determinant of the level of physical activity among their participants. These findings support the results of the current study, namely that enjoyment and physical activity are positively correlated, and that enjoyment of physical activity significantly predicts physical activity behaviour. Lewis et al (2015) reported that enjoyment appeared to be a stronger predictor of physical activity and suggested that enjoyment exerts its effects through self-efficacy on the physical activity behaviour of the participants. A little more than half of the participants in the current study reported that they enjoyed physical activity, suggesting that there may be other factors predicting physical activity behaviour. The correlation between enjoyment and self-efficacy, which was found in the earlier study, could be one of the other factors affecting the enjoyment of physical activity among the participants in this study.

In the current study, physical activity is moderately correlated with health-related quality of life. However, it is only statistically significant in the domains of mobility, self-care, usual activity and EQ-VAS which is the participants' perceived health status. As supported by the study of Onunkwor et al (2016), participants who were involved in leisure activities such as walking and gardening had higher quality of life due to improved physical function. In the current study, older adults who were more physically active had better scores in all the domains of EQ-5D-5L, suggesting that regular physical activity of moderate intensity is beneficial for health and thus for health-related quality of life. These findings are in accord with the results reported by Halaweh et al (2015). Being physically active also contributes to the lowered risk of disability among older adults, enabling them to remain independent. This was demonstrated by the correlation of physical activity with the physical domains in the EQ-5D-5L, i.e., mobility, self-care and the usual activities. In this study, the pain/discomfort domain from HRQoL is not associated with the level of physical activity. The participants may have been aware of the need to be physically active to improve their condition. It is possible that they were engaged in physical activity due to the facilities and services available in the care homes. A study conducted by Tse et al (2010) reported a significant relationship between pain, ADL and mobility (one of the domains of HRQoL) among older adults living in nursing homes. Their physical exercise programme (PEP) had shown a significant reduction in pain and improvement

in mobility among participants who had chronic pain. The findings of that study suggested that individuals with chronic pain could participate in physical activity and might find some improvement as well. Through physical activity, participants can avoid the cycle of disuse and inactivity that ultimately leads to disability.

It could be postulated that, in general, there was a direct relationship between physical activity and health-related quality of life. Participation in physical activity at least five times a week (150 minutes of physical activity per week) was associated with better quality of life, namely in the physical and social domains conducted in a quality of life study among people with a history of colorectal cancer in the United Kingdom (Grimmett et al, 2011). Similar findings were noted in the current study, indicating favourable outcomes of HRQoL with high levels of physical activity. A similar trend was noted in a study that reported moderate accumulation of physical activity being an important determinant of HRQoL in older Japanese men (Yasunaga et al, 2006). Clinically, greater participation in physical activity may have a direct relationship with health-related quality of life among the elderly residing in care facilities.

Strengths and Limitations

To the best of the authors' knowledge, this is the first study to report authentic information about physical activity and the association between enjoyment of physical activity and health-related quality of life among institutionalised elderly persons in Malaysia. The measuring instruments employed in this study are standardised and commonly used among elderly people. The sizeable number of participants involved in the project, all from the same geographical area, is a point of strength.

As this was a cross-sectional study, the authors were unable to infer a cause-and-effect relationship between physical activity and HRQoL. Longitudinal studies could be more informative on the patterns of physical activity and the association with several variables among institutionalised older adults; hence future studies could focus on this type of design. Similarly, further research could explore the feasibility of involving physiotherapists in supervised exercise sessions at elderly care homes, and investigate whether collective leadership might support effective physical activity involvement.

CONCLUSION

The study findings indicated the poor physical activity level of institutionalised older adults. The findings also demonstrated that participants who were physically active had higher quality of life scores than those who were physically inactive. Enjoyment appeared to be a moderate predictor of physical activity. In view of the prevalent physical inactivity in the surveyed population, it is essential to design programmes that encourage and enable more physical activity, in order to combat the risk factors of a sedentary lifestyle.

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