

SYSTEMATIC REVIEW

Barriers and Drivers of Physical Activity Participation Among Older Adults in Malaysia: A Systematic Review

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ABSTRACT

Introduction: Ageing is commonly linked with physical inactivity. This review was performed to identify the factors associated with participation in physical activity among older adults in Malaysia. **Methods:** A systematic review was conducted using five databases; Pubmed, Sagepub, Scopus, Cochrane Library and Science Direct. Observational and intervention studies published between January 2010 and December 2020 were included, with Malaysian older adults aged 55 years and older being the main subject. **Results:** A total of 9 articles were included in the review. Analysis was guided by the Social Ecological Model for Health Promotion. The review had successfully identified gender, age, education level, health reasons, ethnicity and attitude as intrapersonal factors, social support (friend) and marital status as interpersonal factors, and locality as well as availability of facilities as environmental factors. **Conclusions:** Physical activity participation among Malaysian older adults were mainly determined by intrapersonal factors, particularly gender, health condition and educational level.

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INTRODUCTION

Globally, the population is getting older due to the percentage of older persons continually increasing, with more rapid ageing process observed among the developing countries. Numerous scientific evidence refers older adults as those 65 years old and older despite the understandings and definitions about this age range vary by source (1). The socio-cultural referents have been used in available literature to define age, including family status (grandparents), physical appearance, or age-related health conditions (2).

Frailty and falls are two important domain of the geriatric giant which is associated with the significant decline in muscle mass and neuromuscular functions. Many problems related to performing daily activities were also reported due to reduced muscle mass and muscle weakness. However, these common

physiological changes associated with ageing process can be effectively counteracted by active involvement in physical activities (PA) or exercise (3). PA refers to any bodily movement produced by skeletal muscles, aimed at executing any task or activity (4) that results in consumption of energy, ranging from daily physical or leisure activities to extreme sports or exercise (5). According to the World Health Organization (WHO), declining of functional capacity among older persons can be cost-effectively and efficiently prevented through exercising (6), apart from managing and preventing the progress of certain chronic diseases.

Older persons who are actively performing physical activities are not only more protected against debilitating physical illnesses such as stroke, cardiovascular disease and diabetes (7), but also mental health problems (8), and dementia (9), with significant impact on the quality of life and wellbeing (10). Despite the numerous positive impacts particularly on health, PA levels among older adults remain below what has been recommended by WHO (11), with one in every four to five adults being physically inactive (5). Increase likelihood of increased body fat, lean body mass reduction, and skeletal muscle

atrophy (5), with physical inactivity which eventually leads to sarcopenia. It is the combination of low muscle mass and muscle strength and/or low physical performance that led to the development of sarcopenia (12) and increase dependency towards performing activities of daily living (13).

The Social Ecological Model for Health Promotion has been frequently utilised in numerous interventions related to behavioural change, including in the development of intervention to improve PA participation (14-16). A comprehensive approach was used as evident by the multiple level factors that might be determinants of PA (17). The ecological theory and socio-ecological models have emerged in the modern physical activity research era as dominant and valuable frameworks (18), to explain the factors related to intrapersonal, interpersonal, organisational, community and public policy levels, and the influences interact across the different levels (18).

Poor PA participation among the older adults is also an important issue in Malaysia. Poor health and low PA participation among older Malaysian have been an increasing public health concern. According to Lee and colleagues (19), 16% of mortality from all causes and 18% of mortality from colon cancer among the general adult population in Malaysia were attributed to physical inactivity. Various factors have been linked with PA participation or physical inactivity among Malaysian older persons. Significant increase in physical inactivity has been linked with increase age and female gender (20-22). This review aimed at identifying the factors (drivers and barriers) associated with physical activity or inactivity among older adults in Malaysia.

METHODOLOGY

Data source and search strategy

This review was conducted in 2020. The review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement (23). Articles included were observational studies either cross-sectional, cohort, or case-control, as well as intervention studies either randomized control trials or quasi-experimental studies published between January 2010 and December 2020. The main subject discussed in the articles was Malaysian older adults, which refers to those aged 55 years and older. This age range was selected to allow greater number of eligible articles as well as considering Malaysia as a developing country and the variation in definitions used to define older adults in previous articles (2). Only original studies conducted in Malaysia were included with non-original articles such as grey literature, case reports, reviews, conference abstracts and proceedings, official government reports, as well as related studies involving non-Malaysia and articles written in other languages than English or Malay were excluded.

A comprehensive search was performed by five authors (NMN, WSWG, MHB, MIMS, ZY) using five electronic databases, which include Pubmed, Sagepub, Scopus, Cochrane Library, and Science Direct. The literature search was undertaken using a combination of keywords; ('factors' OR 'determinants' OR 'drivers' OR 'barriers') AND ('physical activity' OR 'physical inactivity' OR 'exercise' OR 'leisure activity') AND ('older adults' OR 'elderly' OR 'older persons' OR 'senior citizen') AND ('Malaysia') in the abstract, title or keywords fields, followed by removal of duplicated articles electronically and then manually. In the context of behavioural change, barrier is defined by the Merriam-Webster dictionary as obstacles or something immaterial that impedes or separates, with drivers refer to one that provides impulse or motivation. The titles and abstracts of the study were screened to determine their relevance to the outcomes of concern.

Three authors (NMN, WSWG, MHB) were involved to independently screened the titles and abstracts of the articles to categorise them into included, excluded, or unclear. Retrieval of those included and unclear were done to further assessment their eligibility to be included in the review. Any discrepancies in the assessment were resolved by a discussion leading to a consensus.

Data extraction procedure

The initial screening process involved the removal of duplicated publications, identified from the title abstracts through assessment of the title of the articles, authors' names, study design, and sample size. This was followed by a detailed assessment of the abstract and content of the article to ensure the inclusion and exclusion criteria were fulfilled. The results for quantitative studies included in the review had to possess mean, median, percentage, or a specific measure of estimates, either calculated crude odds ratio, adjusted odds ratio, relative risk ratio, gamma correlation value, standardized beta coefficient with 95% confidence interval that does not include one or a p-value of less than 0.05 were analysed and extracted to have the significant factors included. For the qualitative study, the main theme identified as drivers or barriers towards physical activity participation among older adults were extracted.

Grading of evidence

The quality of individual studies was assessed using the Crowe Critical Appraisal Tool (CCAT) (17). CCAT Form was used to evaluate the quality of each article, and to ensure the validity and reliability of the scores. The CCAT Form is divided into eight categories and 22 items including preliminaries (title, abstract and text), introduction (background and objective), design (research design, exposure or treatment, outcome and measure and bias evaluation), sampling (size and sampling protocol), data collection (collection method and protocol), ethical matters, results (analysis, interpretation, and outcome) and discussion. The score

for each category uses a 6-point scale from 0–5. The lowest score is 0 and 5 is the highest score. The overall score is 40 (100%). The total score was then converted into a percentage whereby the quality of each article was categorized into poor quality ($\leq 50\%$), acceptable quality (51–74%), high quality ($\geq 75\%$) (24).

Analysis

Upon completion of screening, articles selected for final review were retrieved, and extraction of data was conducted. The data from the selected studies were extracted according to characteristics of individual study as well as the drivers and barriers which may be reported as associated factors or risk factors or protective factors of physical activity. Information extracted from each study include study design, study location, sample size, objective of the studies and major findings (drivers and barriers of physical activity participation among older adults in Malaysia). These factors (drivers and barriers) were categorized according to the Social Ecological Model for Health Promotion, which consist of intrapersonal (individual), interpersonal, community, organizational and public policy constructs. The model was chosen because it addresses all levels of the framework and gives better understanding on the potential interactions between the multifaceted levels of factors.

RESULTS

Search results

A total of 3523 records were identified with 2208 records remained after removal of 1315 duplicates. Of those remaining, 550 were further removed based on title and abstracts and further 1612 records were deemed ineligible based on the predetermined eligibility criteria. All original articles examining the factors (drivers and barriers) of PA participation among the older adults (≥ 55 years old) in Malaysia were selected for the next stage of screening. Articles with non-related outcomes or scopes such as PA related mental illness and psychological wellbeing, younger study population, non-original articles such as grey literature, case reports, reviews, conference abstracts as well as reviews and meta-analyses were removed. Articles with sampling population without clearly defined age and articles with poor quality assessed using CCAT were removed. After thorough assessment of 20 potential full texts, only 9 were included in the final review (Fig. 1).

Characteristics of the included studies

All 9 articles included in this review were peer-reviewed papers. The general characteristics of the included studies and their key findings were summarized in Table I. A total of eight studies were cross-sectional studies (22,24,26–31), with one quasi-experimental study (32) designs each. Seven studies were conducted in different areas in the peninsular of Malaysia (24,26,27,28,29,30,32), and another two studies

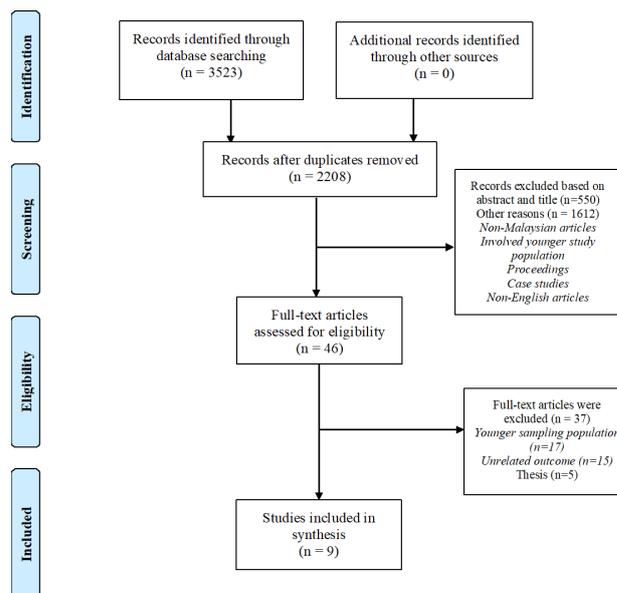


Figure 1: PRISMA flowchart

involved nationwide surveys involving each state in Malaysia (22,31). The sample size ranged between 60 and 4831. The factors (drivers and barriers) identified belong to the intrapersonal, interpersonal, and enabling environment constructs only. Detailed characteristics of each article are presented in Table I.

Quality of included articles

The quality assessment of individual articles is shown in Table II. The Crowe Critical Analysis Tool was used to appraise individual selected articles, which is an established and validated tool to assess the quality of observational studies. Among the selected articles, the highest score was 90% (25,26) and the lowest score was 70 % (27,28), which were categorized as acceptable quality.

Main findings

Intrapersonal factors

Six main factors were identified under intrapersonal construct which include gender (22,24,26,27,28,30,31), age (22,27,28,31), education level (24,27,28), health reasons (28,29,31,32), ethnicity (22,28) and attitude (28,32). Being male acts as a driving factor towards PA participation among older adults (24,30), with female older adults having a higher likelihood of physical inactivity (22,31). Meanwhile, increasing age is associated with an increased likelihood of physical inactivity among older adults, particularly those 80 years old and older (22,31).

Additionally, a better or higher education level was found to have a positive association with PA (24,28). The importance of health on PA participation among older adults was also reported in several studies included in

Table 1: Characteristics and summary of the results of the included studies

Year/ Citations	Study design	Study location	Sampling population/ sample size	Key findings		
				Intrapersonal (Individual)	Interpersonal	Enabling environ- ment
2012/ 25	Cross-sectional study	Selangor - Petaling/ Klang/ Hulu Langat and Kuala Langat.	268 older adults, ≥ 60 years old	Drivers: Gender: Male elderly (t = 2.866, P = 0.005), Higher education level: Those received at least secondary education (t = 2.826, P = 0.005)	Driver: Those who are still married (t = 3.018, P = 0.003)	Driver: Those living in the urban area (t = 3.429, P = 0.001)
2013/29	Cross-sectional study	Selected village in Kuang, Selangor, Malaysia	60 older adults, aged ≥ 60 years old	Barriers: Too tired (51.7%), Not enough time (48.4%), Already active enough (38.4%), Do not know how to do it (36.6%), Poor physical conditioning (28.3%), Too lazy (23.3%), Limiting health problem (21.6%), Causes too much pain (20%)	Barriers: Lack of motivation (38.4), Ashamed (33.4), No one to exercise with (28.3%), Disapproval of others (25%)	Barriers: Lack of facilities (35%), Lack of transport (16.7%)
2014/ 30	Cross-sectional study	Selangor	192 Malay elderly aged 60 years and older	Driver: Being male increase the likelihood to participate in PA (β=0.18, p=0.008)	Driver: A unit increase in perceived social support received from friends will increase the PA score by 2.018 (p<0.001)	-
2014/ 32	Quasi-experimental trial	Sri Labuan, Sri Sabah, Jalan Siakap, and Desa Tun Razak in Cheras, Kuala Lumpur	65 sarcopenic older adults	Men: - attitude (β=0.60) and perceived behavioral control (β=0.24) were the major predictors of intention to exercise. - “Not motivated to exercise” (β =-0.36) was the specific factor within the attitude component that negatively influenced the intention to engage in exercise (Barrier). Women: - Subjective norm (β =0.82); perceived behavioral control (β =0.34); and attitude (β =0.24) were the significant predictor of intention to perform the exercise. - “Want to be healthier” (β =0.80), positively influence exercise behavior in women (Driver). Women: - “Family support” (β =0.74), and “friends’ perception” (β =0.58) positively influence exercise behavior in women (Drivers). - “Occupied taking care of grandchildren” (β =-0.64) was the most specific factor that negatively influenced the intention of elderly women to perform exercise (Barrier).	-	-
2015/ 22	Cross-sectional study	Nationwide survey involving each state in Malaysia	4831 older adults aged 60 years and older	Barriers: Sex – Female (OR: 1.37, 95%CI: 1.11-1.70), Ethnicity – “Other Bumiputera” (Sabah & Sarawak) (OR: 1.98, 95%, CI: 1.25-3.01), Age group - > 80y/o (OR: 3.57, 95% CI: 2.06-6.18)	-	Barrier: Urban Locality respondents (OR: 1.31, 95%CI: 1.02-1.69)
2017/ 27	Cross-sectional study	Kajang, Selangor	100 elderly aged 60 years and above	There is a significant relationship between physical activity and gender (χ ² = 13.50, p<0.001), age (χ ² =6.565, p0.010), level of education (χ ² =8.126, p0.004)	-	-
2019/ 31	Cross-sectional study	Nationwide survey involving each state in Malaysia	3790 older adult aged 60 years and above	Barriers: Females (OR 1.33, 95% CI: 1.01-1.74), Older age [70-79 y/o (OR 1.62, 95%CI: 1.26-2.08), > 80 y/o (OR: 3.12, 95%CI: 1.86-5.26)], High household income (≥MYR4000) (OR: 1.42, 95%, CI:1.02-1.99), Inadequate fruits and vegetables consumption (< 5 servings/day) (OR: 1.66, 95%CI:1.03-2.67) , High sedentary time (OR: 1.92, 95%CI: 1.30-2.84), Having diabetes (OR: 1.43, 95%CI: 1.16-1.77), Having mobility impairment (OR 1.55, 95%CI: 1.22-1.97)	-	-
2020/ 26	Cross-sectional study	Klang valley	134 older adults, aged 60 years and above	Barrier: Negative correlation between age and PA (r=-0.231, p=0.007)	Drivers: Single (33.60, IQR 51) & divorcees (37.90, IQR 46) had higher PA than widowed (9.89, IQR 11).	Driver: Those who did not use assistive device had significantly higher PA (44.72, IQR 60)
2020/ 28	Cross-sectional study	Petaling district, Selangor	520 diabetic elderly aged 60 years and older	Significant relationship between LTPA and - Age (B=-0.304) - Gender (B=0.299), - Education level (B=0.109), - Ethnicity (Chinese: B=0.126) and (Others: B= -0.402) - Presence of co-morbidities (B= -0.232) - Attitude towards vigorous exercise (B= 0.115)	Significant relationship between LTPA and social network (B= 0.202).	-

Table II: Quality assessment of included articles

	Quality assessment of studies using Crowe Critical Analysis Tools (CCAT)								
	(25)	(29)	(30)	(32)	(22)	(27)	(31)	(26)	(28)
Preliminaries	5	4	5	4	4	3	5	5	3
Introduction	5	4	4	4	4	4	4	5	4
Design	4	3	4	4	3	3	3	4	3
Sampling	4	3	4	4	3	4	5	4	4
Data collection	4	4	4	3	4	3	4	4	4
Ethical matters	5	4	4	3	4	3	4	5	4
Results	5	4	4	4	4	4	4	5	3
Discussion	4	4	4	5	4	4	5	4	3
Total score (/40)	35	30	33	31	30	28	34	35	28
Percentage (%)	90	75	82.5	77.5	75	70	85	90	70

this review. Poor physical condition and the presence of limiting health problems (29), as well as the presence of comorbidity (28) particularly diabetes and mobility impairment (31) were found to increase physical inactivity. Whereas the desire to be healthier (33) was associated with positive perceptions towards PA and directly increase PA participation among Malaysian older adults.

Attitude was another issue that was found to influence motivation and behaviour toward PA (28,32). Lastly, ethnicity was also found to play a role in PA participation among older adults, Bumiputra of Sabah and Sarawak were more likely to become physically inactive (22) and the Chinese community had increased PA score (28).

Interpersonal

Social networking or social support received from friends (28) particularly among older females (32) and Malay ethnic older persons (30). The absence of friends can be linked with the barriers of PA reported by Justine et al. (29), which include lack of motivation, feeling ashamed, one to exercise with, and disapproval of others. Only one study reported the role of family support in PA involvement among older adults (32). The role of marital status on PA participation among older adults was reported in two studies (24,26). Comparing those who were still married and single, married older adults had higher PA scores (24). However, those who were not married, single, or divorced had higher PA scores compared to the widowed (26).

Enabling environment

The conflicting predicting role of locality on PA among older Malaysians was reported in two studies, with one study reported increased PA among older adults living in the urban area (24) and the opposite finding was reported in the other (22). However, a study by Kaur et al. (22) involved a nationwide study, which may reflect the actual relationship, compared to the one conducted by Minhat and Mohd. Amin (25) which was conducted among older in selected districts in the state of Selangor. The availability of suitable facilities (29), were factors facilitating PA participation among older persons, which

probably explained the higher PA mean scores among older adults living in the urban area (24).

DISCUSSION

PA participation in later years of life is not only essential to promote healthy ageing and independence, but also helps to prevent chronic diseases. The review successfully identified several important drivers and barriers of PA among older adults Malaysian, which were categorized under the intrapersonal (gender, age, education level, health reasons, attitude, and ethnicity), interpersonal (social support from friends and marital status) and enabling environment (urban locality and availability of facilities) factors.

Intrapersonal (individual)

Gender is one of the individual factors commonly linked with physical activity, with PA gap between males and females has existed since childhood. Globally, many countries reported women being less active than men (33-35), with the global average of inactivity between women and men reported as 31.7% and 23.4% respectively (36). These findings reflected in the current study where female participation in PA were lower compared to male older adults. In general, women are less active and the barriers to women's involvement in PA are numerous and complex, including those of older adults. Among reported barriers related to PA among older women include lack of effort towards physical exertion, potential expenses involved for certain activities, embarrassment and lack of time, lack of motivation and facilities, as well as a misperception that exercises particularly of those vigorous were more proper for girls (38). In addition, women tend to take the lead in family care and household management with some of them having paid work, thus they have less spare time for exercises or other leisure activities (36).

The review also found a proportionate decline in PA with age among older adults in Malaysia, which was also supported by many studies (37,39-41) conducted around the world, which was mainly due to frailty (40). The progressive decline in physical functions and

capabilities particularly among frail older persons may hinder them from becoming physically active (42). However, being physically active may attenuate the impact of age on mortality (43) among them, especially those with underlying comorbidities. Nevertheless, the opposite had been reported in a study among Taiwanese adults, with older women over 65 years old were more likely to exercise regularly compared to those aged 40 to 64 years old, which was potentially due to more leisure time to exercise after retirement, compared to more time to work or family care among those younger (44). This finding was also supported by another Asian study (45), involving urban Chinese women. However, according to the Continuity Theory of Aging, participation in any activities in old age is often a continuation of previous participation, which does not only involve leisure activities but also other domains in life (46). Hence, the initiative to better improve older persons' participation in physical activity should target individuals of younger age.

On the other hand, the role of having a better education level in higher PA participation was almost consistent across ages (44,47,48). According to a study by Shaw and Spokane (48), steeper age-related decline in physical activity was observed among low-education older adults aged 54 to 72 years old, with being unemployed and job losses further reduced their physical activity involvement. Meanwhile, among those with better education, their health problems strongly reduced their physical activity participation (49), indicating the diminishing role of the education gap on PA participation with the onset of morbidity and disability. Health status appears to be a more important factor, especially among older adults who are more likely to experience comorbidities and disability with increasing age, than education level in determining physical activity participation. Having poor health was reported as the most common obstacle to PA in a 16-year follow-up study among the older persons in Finland (50).

Attitude and ethnicity were another two intrapersonal factors identified in this review. The perceived importance of PA was declining with increasing age in both gender groups but more among women than men, which was commonly due to a lack of interest (50). The role of ethnicity on PA participation was also reported in another local study involving younger adults, with Malays tending to engage more in overall physical activity (51). However, a reversed finding was true for the older population, with the Chinese older persons community reporting the highest PA participation (90%) compared to the Malay older persons being the lowest (52). According to Roe et al. (53), high level of health inequalities among the socially disadvantaged adults and older adults may have been contributed by the higher burden of physical inactivity among them (53). The substantial differences in cultural perceptions of physical activity and barriers to engaging in physical

activity among racially diverse groups may have also contributed to the discrepancies in PA participation (54).

Interpersonal

Social support either from friends or spouses was found to be the main interpersonal factor driving PA participation among older adults, particularly older women. However, there have been limited studies exploring the association between social support and PA among older adults, with more focus being given particularly among adolescent age groups (54,55). There have been mixed findings on the relationship between social support received from friends and family members (56,57) with PA participation among older adults, which probably explained the role of marital status (58, 59). According to Cobb et al. (59), the changes in an individual's physical activity were positively associated with the changes in his or her spouse's physical activity. Similarly, spousal pairs with highly active men were reported to be almost three times as likely (OR = 2.97; 95% CI = 1.73, 5.10) to have a similarly active spouse (58).

The presence of companion also plays important role towards PA engagement among older persons. It provides emotional support which created greater enjoyment and positive motivation towards PA engagement (57). In a study among 1,285 older adults aged 60 years and older living in a city in southern Brazil reported, 2.45 and 3.23 times higher likelihood of reaching the PA recommendations among older persons in the presence of family or friends (58).

Enabling environment

Locality (rural vs urban), as well as the availability of facilities, were two factors identified under enabling environment. However, diverse findings have been reported on the role of the rural or urban setting in determining PA participation among older adults, indicating the potential interactions between environmental factors and intrapersonal or interpersonal, such as gender and social support. As previously mentioned, older women who live in rural area in Thailand were 3.64 more likely to be physically active (37), due to the difference activity norms and role among the older persons community living in the rural or urban setting despite the availability of facilities. Higher PA participation among rural older persons was also reported in a study involving rural population in Southern China (60), with the higher level in physical exercise among the older persons people may have contributed to the improved physical condition, mental status, and ADL among them. The relationship between the living and working environment with PA participation has also been reported in previous studies (61-63). However, the observed association between the physical environment and PA participation was mainly among adults under 60 years old (64). Nevertheless, there has been very limited research exploring the role of enabling environment on PA among older persons in Malaysia. At national level,

the Ministry of Health developed national guidelines on physical activity in order to provide essential resources and guidance on physical activity and to achieve optimum health benefits. The National Strategic Plan for Active Living was implemented outlining strategies to encourage Malaysians to be more active. For older person population, the National Policy for Older Persons outline one from six strategies focused on older person's daily activity and improving their physical activity through the implementation of Pusat Aktiviti Warga Emas (PAWE).

Strengths and limitations

This study has limitations which must be taken into account when interpreting the results. It is possible that potential articles were missed due to the search strategies and criteria used; only studies published in English were included, leaving potential studies written in other languages out of account. The age range used (55 years old and above) to define older adults may limit comparison of findings with previous studies conducted in developed countries, which mainly involving those 65 years old and older.

A major strength of our review was that the use of four major electronic databases of several different disciplines, enabling a wider range of factors to be found. Furthermore, the quality of the articles has been evaluated using a highly valid and reliable tool, as well as reporting the results based on the PRISMA guideline. All the steps of this study were done by two or more independent reviewers, which reduces errors and increases the power of the study.

CONCLUSION

The findings of this review highlight the diverse factors influencing PA participation among older adults in Malaysia which were dominated by intrapersonal factors. Strategies to reduce physical inactivity and improve PA participation among older adults should focus on the modifiable factors identified from this review and those at risk, particularly those who are female, increasing age, poor health status as well as poor social and environmental support. Primary public health prevention programs aimed at promoting healthy and active ageing should also target younger age groups to ensure continuity of healthy lifestyle and behaviours. However, majority of the studies included involved small number of respondents, narrow scopes and were concentrated among older adults in the Peninsular Malaysia, reflecting the need for more robust future research. Interventions or promotion program should consider the diversity within the older population, with flexibility needed according to the unique needs of different subgroups.

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