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Physical Activity among Older People with Chronic Illnesses: A Cross-sectional Study

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ABSTRACT

Background: The significance of physical activity in preventing and treating chronic illnesses has long been established. However, there are limited studies focusing on the physical activity among old people with chronic illnesses in Jordan. ***Purpose:*** This study aimed to explore the association between physical-activity level, chronic illnesses, and multimorbidity among people 60 years old and above in Jordan. ***Methods:*** A cross-sectional design was used in the northern region of Jordan. A survey was conducted among 200 old people aged 60 years and above. The survey included sociodemographic data and the International Physical Activity Questionnaire (IPAQ). The statistical analyses included descriptive statistics, correlation coefficient, and logistic-regression analysis. ***Results:*** Approximately 41% of old people had a sufficient level of physical activity. Gender, level of schooling, smoking, heart conditions, diabetes, and multimorbidity were significantly associated with physical activity. In the logistic-regression analysis, gender (OR 0.221, 95% CI 0.096-0.507), heart condition (OR 0.093, 95% CI 0.011-0.760), and diabetes (OR 0.312, 95% CI 0.120-0.810) were found to be significantly associated with physical activity among old people. ***Conclusion:*** This study revealed a low physical activity among old people. It is important to develop policies that support regular physical activity for old people with chronic illnesses. ***Implications for Nursing:*** Community-based health-promotion programs should be developed to encourage regular physical activity among older people with chronic illnesses.

Keywords: Physical activity, Older people, Chronic illnesses, Cross-sectional study.

What does this paper add?

1. This study provides information on physical activity among old people with chronic illnesses.
2. This study emphasizes the importance of promoting physical activity among old people through programs aimed at delaying or significantly reducing

the risk of chronic conditions.
3. Health-education programs should target sedentary and less healthy old people to encourage healthy-aging initiatives.
4. It is recommended that future studies continue to examine the attitudes and beliefs of old people towards physical-activity behaviors and practices.

Introduction

Chronic illnesses, including illnesses such as hypertension, diabetes, and obesity, are more prevalent now than ever before due to population aging (Maresova et al., 2019). Globally, over 80% of deaths are attributed to chronic illnesses, with a particular focus on cardiovascular, respiratory, diabetic, and cancer-related disorders (World Health Organization (WHO), 2019). In Jordan, these illnesses accounted for 78% of deaths in 2019 (Jordan Ministry of Health et al., 2019).

The presence of two or more chronic illnesses in the same old perosn, known as multimorbidity, is a concern for the healthcare of the old-people population due to the increasing prevalence of chronic illnesses (Tugwell & Knottnerus, 2019). It is also a significant health problem that affects old people and is often associated with impairment and a higher risk of death. Additionally, it is costly, leading to increased utilization of healthcare services beyond what would be expected from the person under the effects of chronic illnesses (Alkhawaldeh et al., 2016; Alkhawaldeh et al., 2014; Khan et al., 2022).

Currently, research confirms that incorporating regular physical activity into a person's routine can reduce the risk of mortality and chronic illnesses, while promoting primary-disease prevention (Lear et al., 2017). It is recommended that all adults engage in 150–300 minutes of exercise per week at a moderate to vigorous level, or 75–150 minutes per week at a vigorous to moderate intensity, or a combination of both (Bull et al., 2020). In Jordan, past studies have shown a high prevalence of physical inactivity (WHO, 2016), particularly among working mothers (Abu Aqab et al., 2023), school students (Alkhawaldeh et al., 2021) and old people (Muhaidat et al., 2023).

Chronic illnesses are more prevalent among old people and have a significant impact on their overall health and quality of life (Abraham et al., 2022). The importance of physical activity in preventing and managing chronic illnesses has long been established (Dhuli et al., 2022). However, in Jordan, there are limited studies that specifically focus on physical activity among old people with chronic illnesses. Jordan is currently experiencing a rapid shift towards an aging population, highlighting the significant role that physical activity plays in the daily routines of many seniors.

To create successful interventions and encourage healthier lifestyles in this group, it is crucial to understand the level of physical activity among old people with chronic illnesses. The present study aimed to investigate the association between physical activity level, chronic illnesses, and multimorbidity among old people 60 years old and above in Jordan.

Method

Study Design

The present cross-sectional study was completed among old people aged 60 years and more who lived in Irbid governorate in the north of Jordan during the period 2022-2023.

Setting and Population

The study was conducted in various catchment areas within Irbid governorate, located 70 km north of Amman, Jordan (Jordan Ministry of Health/Irbid Health Directorate, 2021). Irbid governorate is estimated to have a population of approximately 2 million inhabitants, accounting for 18.5% of the total population (World Bank Group, 2022). A catchment area refers to a specific geographical region served by a governmental institution or healthcare facility (Webster's New World College Dictionary, 2010). For this study, the catchment areas associated with four Primary Health Care (PHC) centers in rural and urban locations across Irbid governorate, were randomly selected to ensure a representative sample. The target population consisted of all older individuals served by the PHC centers in Irbid governorate, while the accessible population included older individuals residing within the catchment areas of the four PHC centers in Irbid governorate.

Inclusion Criteria

Old people who (a) agreed to take a 15-minute interview, and (b) are aged 60 years and more.

Exclusion Criteria

Old people incapable of responding to questions because of diseases.

Sampling and Sample Size

A sample of 200 older adults participated in the present study. A multi-stage sampling design was implemented, which involved the following steps: (1) randomly selecting four primary healthcare (PHC) centers within Irbid governorate, (2) choosing households located within the service areas of the selected PHC centers using convenience sampling, and (3) approaching the selected households and requesting participation from all family members aged 60 years and above for interviews.

When conducting binary logistic regression, it is important to have adequate statistical power (Warner, 2020). It has been recommended that the minimum sample size (N) should be not less than ten times the number of predictors (K) in the model (Peduzzi et al., 1996). In most cases, a larger sample size, such as 500 observations, is considered suitable (Frees et al., 2014). In the current study, there were 11 predictors. Therefore, based on the criteria established by Peduzzi et al. (1996), a minimum sample size of 110 participants was required for this study.

Data Collection

Data was collected using a questionnaire consisting of two parts: Part one (sociodemographic data) included general information about the participants: Age, gender, smoking (smoker or non-smoker), work status (out of work, working, or retired), level of schooling (no education, primary education, and secondary or more education), and marital status (single, married, widowed and separated/divorced), and income. Cognitive impairment was evaluated by the Elderly Cognitive Assessment Questionnaire (ECAQ) (Kua & Ko, 1992). Chronic illnesses were recognized (yes or no) by response to a question (If physicians had ever told them that they had any of 12 chronic illnesses? heart conditions, hypertension, diabetes, mental illness, cancer, bone fracture, eye problems, respiratory disease, gastrointestinal problems, arthritis, stroke, and osteoporosis. Multimorbidity, which is the entire number of chronic illnesses, was classified as: having no multimorbidity (0 to 1); having multimorbidity (2 or more chronic illnesses). Part two (the physical-activity level) was assessed by the International Physical Activity Questionnaire (IPAQ) short-form (IPAQ Research Committee, 2005). The IPAQ is a widely used tool for assessing physical-activity levels in persons. It is designed to capture information about the frequency, duration, and intensity of various types of physical activities performed by a person (IPAQ Research Committee, 2005). The IPAQ is available in English and many other languages. The Arabic version has been validated and used by numerous studies (Al-Eisa & Al-Sobayel, 2012). According to the IPAQ, persons with a cut-off point of less than 600 METS-min/week were categorized as physically inactive. A metabolic equivalent (METS) is defined as the caloric number used up by a person for each minute in activity relative to the basal metabolic rate (BMR). A single unit (1 MET) is the caloric consumption of a person while being at complete rest. Those who attained 600 METS-min /week or more were categorized as physically active (IPAQ Research Committee, 2005).

Validity and Reliability of the IPAQ

The IPAQ is a valid and reliable tool for assessing physical-activity levels in persons. The IPAQ has been widely validated in many studies across different settings and populations. These studies have revealed that the IPAQ shows good validity in assessing physical-activity levels when compared to objective measures, such as direct observation or accelerometers (Craig et al., 2003). The IPAQ has also revealed good reliability, indicating that it consistently measures physical-activity levels in a consistent manner. Test-retest reliability studies have revealed that the IPAQ yields consistent results when administered to the same persons on different occasions (Balboa-Castillo et al., 2023).

Statistical Analysis

IBM SPSS Statistics (SPSS Inc., an IBM Company, and Chicago, IL, USA) performed data analyses. Descriptive statistics were used to analyze the sociodemographic data. This consists of frequency, percentage, mean, and standard deviation. The correlation-coefficient test was used to test the relations between dependent (IPAQ) and independent variables in sociodemographic data. The independent variables that correlated with IPAQ were entered into the logistic-regression model. Statistical significance was set at $P < 0.05$.

Ethical Considerations

Approval to conduct the study was achieved from the university. All participants were knowledgeable that the collected data would be preserved with confidentiality. Also, an informed consent was attained from the study participants.

Results

Table 1 shows the characteristics of old people participating in this study. The mean age of the participants was 68 years (SD = 6.9), with a majority of male participants (58%) and most of them were married (88%). Approximately 36.5% of the participants had no education, while 42.5% of them had completed primary school, and 21% had a secondary education or higher. The majority of the participants were unemployed (76%) and non-smokers (70%). The most common chronic illnesses among old people were hypertension (43%), diabetes (36.5%) and heart conditions (16%). The prevalence of multimorbidity was 38.5%. Overall, 41% of old people had a sufficient level of physical activity.

Table 1. Descriptive statistics of the variables of participating old people (N = 200)

Variables	N (%)	Mean (SD)
Age		68.24 (6.96)
Gender:		
Male	116 (58%)	
Female	(84 (42%)	
Smoking:		
Non-smoker	140 (70%)	
Smoker	60 (30%)	
Work status:		
Employed	48 (24%)	
Unemployed	152 (76%)	
Level of education:		
No education	73 (36.5%)	
Primary education	85 (42.5%)	
Secondary or more	42 (21%)	
Marital status:		
Married	176 (88%)	
Unmarried	24 (12%)	
Monthly income		217.87 (87.47)
Cognitive impairment		
Having cognitive impairment	15 (7.5%)	
Chronic illnesses:		
Heart conditions	32 (16%)	
Hypertension	86 (43%)	
Diabetes	73 (36.5%)	
Mental illness	1 (0.5%)	
Cancer	5 (2.5%)	
Bone fracture	3 (1.5%)	
Eye problems	6 (3%)	
Respiratory disease	7 (3.5%)	
Gastrointestinal problems	12 (6%)	
Arthritis	17 (8.5%)	
Stroke	4 (2%)	
Osteoporosis	7 (3.5%)	
Multimorbidity:		
No (0-1)	123 (61.5%)	
Yes (2 or more chronic illnesses)	77 (38.5%)	
Physical-activity level:		
Sufficient	82 (41%)	
Insufficient	118 (59%)	

Gender, level of education, smoking, heart conditions, diabetes, and multimorbidity were

significantly associated with physical activity (r = 0.30, p = 0.01). These factors were included in the logistic-regression analysis. However, age, work status, marital status, monthly income, cognitive impairment, hypertension, mental illness, cancer, bone fracture, eye problems, respiratory disease, gastrointestinal problems, arthritis, stroke, and osteoporosis were not significantly associated with physical activity (p>0.05) and were therefore excluded from the logistic-regression analysis.

The logistic-regression analysis showed that gender (OR 0.221, 95% CI .096-.507), heart condition (OR .093, 95% CI .011-.760), and diabetes (OR .312, 95% CI .120-.810) were significant factors associated with the level of physical activity among the old people (Table 2).

Table 2. Logistic-regression analysis of predictors of physical activity among old people

						95% CI*	
Predictors	**B**	**S.E.****	**Wald**	**p value**	**Exp. (B)**	**Lower**	**Upper**
Gender	-1.511	0.424	12.694	0.001	0.221	0.096	0.507
Heart conditions	-2.378	1.074	4.906	0.027	0.093	0.011	0.760
Diabetes	-1.164	0.487	5.723	0.017	0.312	0.120	0.810

* Confidence Interval (CI) = 95%.
** S.E. = Standard Error.

Discussion

Sedentary life has become a prominent feature in society, leading to an increase in chronic illnesses that are the key causes of death worldwide (Park et al., 2020). This is despite the fact that physical activity has been proven to prevent the occurrence of many illnesses that have direct and indirect consequences for society (Burini et al., 2020).

The current study aimed to explore the association between physical-activity level, chronic illnesses, and multimorbidity among older people aged 60 years and above in Jordan. The results showed that gender, level of education, smoking, heart conditions, diabetes, and multimorbidity were all significantly linked to physical activity. Additionally, the logistic-regression analysis revealed that gender, heart conditions, and diabetes were the most influential factors in predicting physical-activity level among old people.

The low physical-activity level established in this study was comparable to findings from other past studies (Mejia et al., 2017). The level of physical activity changes during the course of life, with it being considerably lower in old people (Suryadinata et al., 2020). Aging is a risk factor for the development of many chronic illnesses, and regular physical activity can significantly reduce these risks (McPhee et al., 2016). This must be taken into consideration when designing health-promotion programs for old people. Some suggested features for physical-activity programs aimed at increasing participation among older adults may include fostering relationships among participants, providing exercise routines tailored to specific cultural backgrounds, offering convenient locations for classes in residential areas, partnering with social-service programs to provide classes before or after their sessions, educating families on the importance of physical activity for older adults and ways how they can contribute, offering low-cost or free classes, and involving older adults in the development of the programs (Belza et al., 2017).

Based on the results, there was a high incidence of physical inactivity among old men, which aligns with previous studies (Mejia et al., 2017; Pengpid & Peltzer, 2022; Ribeiro et al., 2016). However, some prior research has found a higher occurrence of physical inactivity among women compared to men (Devamani et al., 2019). Additionally, the high prevalence of physical inactivity among old men contradicts the findings of a study by Queiroz et al., which found no significant difference in the prevalence of physical inactivity between older adult men and women (Queiroz et al., 2014). This finding may be attributed to various factors, such as psychological issues, familial and societal roles, and life circumstances and illnesses, which could potentially explain these discrepancies (Giuli et al., 2012).

In the current study, old people with heart conditions were found to have an insufficient physical-activity

level. A previous cross-sectional study was conducted in Peru to assess physical-activity level and its relationship with chronic illnesses among old people and found that those with heart disorders had an insufficient physical activity (Mejia et al., 2017). Similarly, a study in India showed a clearly association between heart diseases and physical inactivity in older adults (Pengpid & Peltzer, 2022).

This study indicated that old people with diabetes have insufficient levels of physical activity. This finding is supported by a previous study conducted in Malaysia, which found that diabetes was associated with physical inactivity in old people aged 60 years and more (Chan et al., 2019). Additionally, a recent Chinese study examined the relationship between level of physical activity and diabetes symptoms among old people. The results showed a significant link between physical inactivity and diabetes in this population (Tian et al., 2023). It is important to note that physical activity can prevent and treat diabetes in old people. Therefore, it is crucial for individuals to increase their physical activity to improve their overall health and reduce their risk of chronic illnesses (Tian et al., 2023). This suggests that persons in their forties and fifties should prioritize increasing their physical activity to decrease their risk of developing diabetes. Finally, in order to better understand the needs and preferences for physical-activity programs among old people, future studies should focus on their perceptions of physical activity and the factors that influence their engagement in physical activity (Belza et al., 2017).

Limitations

The present study analyzed data from old people, and prior to this, only limited information on the relationship between chronic illnesses and levels of physical activity among old people in Jordan was available. However, this study has some limitations. It was conducted only in Irbid governorate, located in the northern region of Jordan. Further research should be carried out in other areas of the country. Additionally, this study utilized a cross-sectional design, which prevents the establishment of any causality. Furthermore, the results of this study may be subject to self-report bias, as the data was collected through a self-administered questionnaire.

Implications for Nursing

The results of this study have important implications for community nursing practice: (a) It is important to promote physical activity among old people through targeted programs, in order to delay or significantly reduce the risk of chronic illnesses and decrease mortality. (b) Future health-education programs and interventions should prioritize sedentary and less healthy older individuals in order to promote healthy aging (Hayajneh et al., 2023). (c) Additional studies should continue to explore the attitudes and beliefs of older individuals towards physical-activity behaviors and practices. (d) Policies should be implemented to encourage regular physical activity for individuals with chronic illnesses.

Conclusion

The study findings revealed a low physical-activity level among old people. Gender, heart conditions, and diabetes were found to be related to insufficient level of physical activity among old adults. It is important for policymakers, researchers, and healthcare professionals in the field of gerontology and chronic-illness management to develop plans that specifically target and support physical activity among older adults with chronic illnesses. These plans should also consider the unique needs and limitations of older adults, taking into account differences between men and women. This study has important implications for improving the health and well-being of older adults and managing chronic illnesses.

Conflict of Interests

There is no conflict of interests declared by the authors.

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