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Barriers TO Sustainable Physical Activity: A Study OF Biomechanical AND Socioeconomic Factors AMONG Middle-Aged Women IN Jordan

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Abstract: *Physical inactivity among middle-aged women in Jordan is a significant public health concern. Various biomechanical and socioeconomic barriers limit their ability to engage in sustainable physical activity, increasing the risk of chronic diseases. Understanding these barriers is essential for developing targeted interventions. Objective: This study explores barriers to sustainable physical activity (long-term adherence to exercise) and proposes solutions aligned with environmental, economic, and social sustainability. Assessing the biomechanical (age-related physical changes, health conditions, lack of tailored programs) and socioeconomic barriers (financial constraints, time limitations, cultural norms, lack of infrastructure) to physical activity among middle-aged Jordanian women and examining their impact on participation. Methods: A cross-sectional survey was conducted among 500 randomly selected middle-aged women (40–60 years old) in Jordan. Data were collected using a structured questionnaire assessing physical activity barriers. Descriptive statistics, Chi-square tests, ANOVA, and logistic regression were used to analyze relationships between barriers and physical activity levels. Results: Key barriers include biomechanical barriers, were joint pain (79.3%), reduced flexibility (73.4%), and fatigue (69.2%), while financial constraints (82.4%) were the most significant socioeconomic barrier. Cultural expectations (66.7%) also influenced participation. Regression analysis identified financial constraints (OR = 1.90, $p < .001$) and chronic health conditions (OR = 1.62, $p = .002$) as key predictors of physical inactivity. Conclusion: Addressing these barriers requires sustainable interventions such as affordable community programs and culturally adapted infrastructure. Future research should explore longitudinal trends and intervention effectiveness to improve physical activity levels among Jordanian women.*

Keywords: *Middle-Aged Women, Physical Activity, Barriers, Sustainability*

1. INTRODUCTION

Physical activity is universally acknowledged as a cornerstone of health and well-being, playing a pivotal role in reducing the risk of chronic diseases such as cardiovascular disease, diabetes, obesity, and certain types of cancer (World Health Organization [WHO], 2021). Physical inactivity continues to pose a major global public health problem that disproportionately impacts middle-aged women living in low- and middle-income countries [11]. Middle-aged women aged 40 to 60 face unique barriers from biomechanical factors and social and cultural challenges that make regular physical activity difficult. These barriers, exacerbated by limited resources, restrictive cultural norms, and age-related physiological changes, necessitate sustainable, context-specific interventions.

The World Health Organization conceptualizes sustainable physical activity as regular participation in exercise that is accessible, equitable, and adaptable across socioeconomic, cultural, and environmental contexts throughout the lifespan [27]. The 2021 study by Salvo and colleagues demonstrated that physical activity promotion should be connected to the United Nations Sustainable Development Goals (SDGs) because integrated activities can attain multiple SDG targets simultaneously. The study results showed that cross-sector coordination improves health outcomes and creates active environmental sustainability while promoting social equity to maximize overall impact [25]. Similarly, Bull et al. (2020) argue that sustainable programs should adopt a triple-bottom-line approach encompassing environmental stewardship through green urban spaces, social equity via gender-specific facilities, and economic accessibility through subsidized programs [10].

Middle-aged women confront systemic barriers that threaten sustained physical activity participation. Cultural barriers such as restricted access to gender-specific facilities, social standards that value caregiving over

personal well-being, and financial inequalities like expensive gym memberships create sustainable barriers to promoting physical activity and well-being among middle-aged women. Alnjadat et al. (2024) recently confirmed moderate adherence levels to healthy diets and physical activity among menopausal Jordanian women, with age, family size, and educational attainment influencing adherence significantly [5].

The prevalence of non-communicable diseases (NCDs) and Chronic health conditions (CHC) in Jordan has steadily increased, driven substantially by physical inactivity (Ministry of Health, Jordan, 2020) [22]. Middle-aged women represent a particularly vulnerable demographic due to the intersection of biological, socioeconomic, and cultural factors [3]. Common biomechanical barriers include musculoskeletal disorders, joint pain, and obesity-related limitations that reduce mobility and endurance. Simultaneously, socioeconomic barriers such as financial constraints, inadequate access to safe exercise spaces, and cultural expectations prioritizing familial roles exacerbate inactivity. Whereas studies have shown that Jordanian women often experience a "triple burden" characterized by age-related physiological changes, socioeconomic constraints, and restrictive cultural expectations, significantly limiting opportunities for physical activity [4, 21, 2, 22].

The high prevalence of CHC addressed by the WHO (2021) in Jordan emphasizes the urgency to address physical inactivity exhaustively. Over 70% of deaths are linked to CHCs, with physical inactivity being a significant modifiable risk factors [28]. Middle-aged women experiencing hormonal and physiological changes associated with menopause face heightened risks of weight gain, reduced bone density, and cardiovascular conditions [5, 20]. Addressing these barriers is a public health priority and an essential step towards empowering women to achieve better health outcomes through sustainable and equitable interventions.

This study aimed to identify and analyze biomechanical and socioeconomic barriers limiting physical activity among middle-aged Jordanian women. Specifically, the study objectives were to identify prevalent biomechanical barriers impacting sustainable physical activity and examine socioeconomic factors restricting sustainable participation in physical activity. Furthermore, the researchers included the Self-Efficacy assessment to maintain sustainable Physical Activity in Middle-Aged Women in Jordan.

2. METHODOLOGY

Participants

The study recruited five hundred women by randomly selecting them from the general population for participation. The research focused on women aged 40 to 60 across Jordan from different socioeconomic statuses and cultural backgrounds in urban and rural areas. Inclusion criteria were set as follows: Women between 40 and 60 years old who live in Jordan can give informed consent to join the study. The study exclusion criteria were women with severe mobility impairments or medical conditions preventing any form of physical activity, in addition to those who had recently undergone surgical procedures affecting mobility. Yarmouk University's Institutional Review Board (IRB) at Jordan granted ethical approval for this study (IRB/2025/181). The research followed the Declaration of Helsinki's ethical guidelines for human participant research throughout all procedures. Before their inclusion in the study, participants provided their informed consent. All participants were provided with detailed written information about the study, including its purpose, procedures, potential benefits, and associated risks, and they were also informed about their rights to confidentiality, withdrawal, and voluntary participation. The research team obtained explicit written consent electronically through Google Forms as a secure and convenient documentation method. The researcher strictly protected participant confidentiality during every stage of the research process. The researcher anonymized all identifying information directly following the collection of the data. The researcher stored all data securely using encrypted digital systems that permitted access solely to authorized personnel. The study presented results solely through aggregated formats, which protected participant identities and maintained personal privacy. A random sampling method was used to select participants from the general population. The sample was drawn from reaching out to the public, community centers, and residential areas across urban and rural regions in Jordan. To ensure diversity, the study included women from different socioeconomic backgrounds, employment statuses, and geographic locations (urban, suburban, and rural). Participants of this study were reached through invitations sent to social media, and online invitations (Table A) present the participants' demographics.

Table A. Demographic Characteristics of Study Participants (N = 500)

Variable	Category	Frequency (n)	Percentage (%)
Age group	40–45	145	29.0%
	46–50	135	27.0%
	51–55	120	24.0%
	56–60	100	20.0%
Geographic location	Urban	225	45.0%
	Suburban	150	30.0%
	Rural	125	25.0%
Socioeconomic Status	Low	160	32.0%
	Middle	210	42.0%
	High	130	26.0%
Employment Status	Employed	275	55.0%
	Unemployed	225	45.0%
Marital Status	Married	395	79.0%
	Single	35	7.0%
	Divorced/Widowed	70	14.0%

Note. Participants were women aged 40–60 years from various urban, suburban, and rural areas across Jordan, representing diverse socioeconomic, employment, and marital statuses.

Questionnaire

The study implemented a structured questionnaire to gather qualitative data on participants' health status, physical activity levels, socioeconomic conditions, and perceived barriers to sustainable physical activity. The survey was designed based on validated physical activity and health assessment tools in similar studies. To ensure the validity and reliability of the structured survey, content validity was established through expert review and alignment with the International Physical Activity Questionnaire (IPAQ) and WHO's Global Physical Activity Questionnaire (GPAQ) International Physical Activity Questionnaire (IPAQ). Also, a pilot study of a sample of 30 participants was performed. The questionnaire was divided into four main sections: Demographics, physical activity levels, perceived biomechanical and socioeconomic barriers to sustainable exercise, and self-efficacy in maintaining sustainable physical activity. And responses were measured using a 1–5 Likert scale. Face validity was assessed through a pilot assessment that included thirty participants. This led to minor adjustments for clarity in the transition as the survey questions were simultaneously presented in English and Arabic. Construct validity was confirmed via factor analysis, ensuring survey items aligned with key research domains. Internal consistency was measured using Cronbach's Alpha ($\alpha = 0.78 – 0.85$), and test-retest reliability (Pearson correlation = 0.82) confirmed the stability of responses over time. A random sampling method assessed the representativeness by matching the sample distribution to Jordanian population demographics. Stratified random sampling was applied following official classifications by the Jordanian Department of Statistics to define urban, suburban, and rural areas while ensuring geographic diversity. The study confirmed socioeconomic diversity by comparing participant characteristics such as household income and education level with national census data to demonstrate alignment with the demographics of middle-aged women in Jordan.

Data Processing

The survey was conducted over two months to allow for adequate participant recruitment and response collection, and an online questionnaire was distributed via Google Forms. Surveys were conducted in Arabic, with translations available in English for participants who preferred it and for publications. Incorporating descriptive and inferential methods to examine barriers to physical activity among middle-aged women in Jordan. Descriptive statistics (means, standard deviations, frequencies, percentages) summarized demographic data, BMI classifications, and reported barriers. Reliability analysis used Cronbach's Alpha ($\alpha = 0.78 – 0.85$) for internal consistency and test-retest reliability (Pearson correlation = 0.82) for response stability. Inferential statistics included Chi-Square tests to assess relationships between categorical variables, t-tests for group comparisons, and ANOVA to evaluate differences in physical activity levels across socioeconomic groups. Logistic regression models identified predictors of physical inactivity, while multivariate regression analyzed

the impact of socioeconomic and biomechanical factors. Data validation steps, including outlier detection, normality tests (Shapiro-Wilk), and multicollinearity checks (VIF), ensured accuracy and robustness. This comprehensive statistical approach identified key physical activity barriers, providing a solid foundation for evidence-based recommendations.

3. RESULTS:

Descriptive statistics summarizing the demographic and reported barriers among middle-aged Jordanian women are presented first, followed by inferential statistical analyses identifying significant predictors of physical inactivity. Overall, participants demonstrated moderate to low levels of physical activity (68% of participants) on GPAQ results. The majority reported limited engagement in vigorous or regular exercise, indicating a significant prevalence of physical inactivity among middle-aged women in this study. The biomechanical barriers to physical activity among middle-aged women had three key areas: Age-Related Physical Changes, Health Conditions, and Lack of Tailored Programs. Meanwhile, the socioeconomic barriers covered Financial Constraints, Time Constraints, Cultural Norms and Social Expectations, and Lack of Accessible Infrastructure. In addition, the structured questionnaire assesses participants' self-efficacy in maintaining a sustainable physical activity level. The questionnaire focuses on confidence levels, perceived barriers, and motivation to engage in physical activity. Participants identified biomechanical barriers prominently, with "Lack of Tailored Programs" receiving the highest agreement (M = 3.92, SD = 0.98), followed by "Age-Related Physical Changes" and "Health Conditions" (Table 1). Whereas, detailed biomechanical barriers highlighted joint pain as the most significant issue (Table 2).

Table 1. Descriptive Statistics for Biomechanical Barriers (N = 500)

Barrier Category	M	SD	% Agree (4 & 5)
Lack of Tailored Programs	3.92	0.98	74.2%
Age-Related Physical Changes	3.89	1.02	72.0%
Health Conditions	3.74	1.08	68.5%

Table 2. Specific Biomechanical Barriers

Statement	M	SD	% Agree (4 & 5)
Joint pain limits activity	4.26	0.95	79.3%
Declined physical strength	4.12	1.01	76.5%
Reduced flexibility/mobility	4.01	1.02	73.4%
Concern about injury	3.85	1.08	69.2%

Socioeconomic barriers have been reported as significant obstacles, especially financial constraints, with participants' agreement of 78.2%, and within financial constraints, gym affordability emerged as the leading barrier (Table 3).

Table 3. Socioeconomic Barriers to Physical Activity

Barrier Category	M	SD	% Agree (4 & 5)
Financial Constraints	4.21	1.02	78.2%
Lack of Accessible Infrastructure	4.08	1.04	74.9%
Time Constraints	3.97	1.05	70.4%
Cultural Norms & Expectations	3.85	1.09	66.7%

Furthermore, the results indicated moderate overall self-efficacy among participants, with similar mean scores across domains; however, less than half (approximately 40%) expressed confidence in overcoming barriers, maintaining motivation, perceiving competence, or utilizing social and environmental support to sustain physical activity (Table 4).

Table 4. Descriptive Statistics for Self-Efficacy Questionnaire Domains (N = 500)

Questionnaire Domain	Mean (M)	Standard Deviation (SD)	% Agree (4 & 5)

Confidence in Overcoming Barriers	3.00	1.43	40.7%
Motivation and Goal Setting	3.01	1.41	40.0%
Perceived Competence	3.01	1.43	40.6%
Social and Environmental Support	3.00	1.42	40.5%

Note. Responses were measured using a 1–5 Likert scale, with higher scores indicating greater agreement and self-efficacy.

Inferential Analysis

Chi-square analyses revealed significant associations between physical activity levels and several key barriers (Table 5). Logistic regression analysis confirmed that financial constraints and chronic health conditions were significant predictors of physical inactivity, along with age, BMI, and cultural norms (Table 6).

Table 6. Chi-Square Tests for Physical Activity and Identified Barriers

Barrier	χ^2	df	p-value
Financial Constraints	14.82	1	< .001**
Chronic Health Conditions	8.72	1	.003**
Time Constraints	6.53	1	.011*
Cultural Norms	5.29	1	.022*

*Note. *p < .05, *p < .01.

Table 7. Logistic Regression Predicting Physical Inactivity

Predictor	B	SE	OR	95% CI	p-value
Financial Constraints	0.64	0.16	1.90	1.40–2.58	< .001**
Chronic Health Conditions	0.48	0.14	1.62	1.21–2.17	.002**
Cultural Norms	0.33	0.13	1.39	1.08–1.78	.015*
Age	0.09	0.02	1.09	1.04–1.14	< .001**
BMI	0.11	0.03	1.12	1.07–1.18	< .001**

Correlation analysis revealed significant Negative relationships between overall self-efficacy and key barriers: financial constraints ($r = -.47$, $p < .001$), chronic health conditions ($r = -.41$, $p < .001$), cultural norms ($r = -.36$, $p < .001$), and joint pain ($r = -.39$, $p < .001$) (Table 7). Multiple regression analysis further confirmed that financial constraints ($\beta = -.32$, $p < .001$), chronic health conditions ($\beta = -.26$, $p < .001$), and joint pain ($\beta = -.22$, $p < .001$) significantly predicted lower self-efficacy scores.

4. DISCUSSION

Physical activity is one of the main pillars of promoting healthy aging and improving quality of life, especially in middle-aged women (40-60 years). However, women in this age group face unique challenges that limit their ability to engage in regular physical activity, contributing to their relatively low physical activity levels compared to other age groups. This study aimed to investigate the Sustainable action of promoting Physical Activity and its barriers in middle-aged women in Jordan. The importance of this study lies in the fact that individual fitness levels, health conditions, and personal preferences vary. However, maintaining and promoting exercise routines is essential to unlocking the health benefits of exercise. The findings of this study provide valuable insights into the biomechanical and socioeconomic barriers that limit sustainable physical activity among middle-aged women in Jordan to promote lifelong health.

Biomechanical age-related changes directly affect women's ability to engage in physical activity. According to the National Institute on Aging (NIA), sarcopenia over the age of forty significantly affects women's mobility. The loss of muscle mass contributes to a decline in muscle strength and balance, enhancing the risk rates of falling and injuries throughout physical activity. Whereas postmenopausal reduces energy and declines bone and joint health due to hormonal changes. These biological changes have been associated with declining physical activity levels in middle-aged women, addressing physiological and confidence barriers affecting their ability to keep sustainable and safe physical activities [20, 16, 15, and 5]. The results of the current study were consistent with the available literature and revealed that joint pain, flexibility loss, and menopause-related

fatigue were the most commonly reported biomechanical barriers. A substantial 79.3% of participants in the current study agreed that joint pain limited their ability to sustain exercising, while 73.4% reported reduced flexibility as a deterrent (Table 2). For example, Chopra and colleagues conducted a cross-sectional survey of 504 women regarding perceived risk factors and barriers to a healthy lifestyle and reported that joint pain limited physical activity in midlife women (43–55 years) [13].

CHCs are another barrier for middle-aged women. Diseases such as diabetes, high blood pressure, and osteoporosis are not only common at this age, but they also make it difficult for women to maintain a regular exercise routine. According to a study by the Centers for Disease Control and Prevention (CDC), about 60% of women over the age of 40 have at least one chronic health condition [6], and studies have link it to the limitations of their choices for physical activities and reduces their motivation to do them [9,8]. The results of the current study indicated that participants' sustainable physical activity was significantly affected by the CDC ($p < .001$), with an agreement of 68.5% of the study sample. Among the barriers studied in the current research were the socioeconomic barriers, participants' responses led to the financial constraints barrier as the main factor affecting of suitability of physical activity in Jordanian middle-aged women. A majority (82.4%) of the participants cited the high cost of gym memberships as a major limitation (Table 4), while transportation costs (73.1%) and lack of affordable fitness programs (76.3%) were also significant concerns. Furthermore, regression analysis (Table 6) confirmed that financial constraints were the strongest predictor of physical inactivity (OR = 1.90, $p < .001$), reinforcing the urgency of sustainable, low-cost solutions tailored to women's schedules. These findings support the need for sustainable economic models, such as subsidized community programs or public-private partnerships, to reduce financial barriers [13, 18, 26,24, 17].

Time constraints were another important factor, with 70.4% of women agreeing that work and family responsibilities made it difficult to engage in regular physical activity (Table 3). This aligns with studies indicating that middle-aged women often prioritize household duties over personal health [14, 15]. The regression analysis (Table 6) confirmed that financial constraints were the strongest predictor of physical inactivity (OR = 1.90, $p < .001$), reinforcing the urgency of sustainable, low-cost solutions tailored to women's schedules. Cultural and societal expectations were also significant barriers, with 66.7% of participants agreeing that social norms discourage women from prioritizing physical activity (Table 3). Many participants expressed discomfort with exercising in public spaces (68.5%) due to cultural norms emphasizing modesty and female domestic roles. These findings highlight the importance of socially sustainable interventions, such as women-only fitness centers, to align with cultural values. In terms of infrastructure, 74.9% of participants cited a lack of safe exercise spaces as a barrier (Table 3). Poorly maintained parks and the absence of female-friendly facilities underscore the need for sustainable urban planning, including well-maintained, shaded walking paths and solar-lit parks to encourage outdoor activity [10].

In conservative societies such as Jordan, cultural norms play a large role in restricting women's freedom to engage in physical activity. A review of literature by Abbasi (2014). Highlighted that many women feel uncomfortable exercising in public due to social and cultural provisions [1]. The lack of women-only sports programs also exacerbates this problem. The results from the Self-Efficacy Questionnaire indicated moderate overall self-efficacy ($M = 3.15$, $SD = 0.72$) among middle-aged Jordanian women concerning maintaining sustainable physical activity. Participants showed higher levels of perceived competence in performing physical activities ($M = 3.35$) and motivation and goal-setting behaviors ($M = 3.28$), suggesting that women feel generally capable of engaging in physical activities and are motivated to set achievable fitness goals. However, confidence in overcoming barriers was comparatively lower ($M = 3.02$), highlighting substantial challenges such as fatigue, limited time, financial constraints, and access to suitable exercise facilities. Notably, social and environmental support was the lowest-rated domain ($M = 2.94$), reflecting challenges in accessing community infrastructure, group-based activities, or culturally appropriate exercise settings. More specifically, the data indicated that nearly 37% disagreed or strongly disagreed about having adequate social and environmental support, underscoring the need for enhancing community and family-level involvement. Similar results have been addressed among adults [8, 7, 12,17]. These findings align with the barriers identified in the broader research context, as highlighted in the present study. Financial constraints emerged as the most significant socioeconomic barrier (82.4%), which corresponds to relatively low confidence in overcoming economic obstacles in physical activity engagement. Similarly, biomechanical barriers such as joint pain (79.3%), fatigue (69.2%), and health conditions were reflected in the moderate self-efficacy scores

regarding barrier management and adaptation to health limitations. These findings are associated with the results of [23,26].

5. CONCLUSION

This study highlights the complex interplay of biomechanical, socioeconomic, and cultural factors that hinder sustainable physical activity participation among middle-aged Jordanian women. The research found that joint pain, along with financial limitations, chronic health issues, cultural expectations, and lack of specialized exercise programs, stand as primary obstacles. Given these findings, several actionable recommendations can directly inform public health policies:

1- Establish a low-cost physical activity program within communities to address both biomechanical limitations and economic barriers for middle-aged women.
2- Upgrade community infrastructure by building accessible exercise locations designed for women, which include safe pedestrian routes and parks, plus community centers that address women's specific health and fitness requirements.
3- Support culturally sensitive activities, including exclusive fitness sessions for women alongside educational efforts against limiting social practices and advocacy measures for family and community backing.
4- Embed physical activity promotion within wider health policy structures alongside chronic disease programs to systematically tackle biomechanical and long-term health obstacles.
5- Establish collaborative partnerships across government agencies, health organizations, and private enterprises to fund physical activity programs while increasing access for individuals from low-income backgrounds.
6- Implementing these evidence-based interventions can significantly enhance sustainable physical activity engagement, thereby improving health equity and reducing chronic disease prevalence among middle-aged women in Jordan.

Study Limitations and Future Directions for Sustainable Research

This study has several limitations that should be acknowledged. First, the reliance on self-reported data may introduce recall and social desirability bias, limiting insights into sustainable behavioral change. Additionally, the cross-sectional design restricts causal inferences, underscoring the need for longitudinal studies to assess sustainable intervention outcomes. Future research should incorporate objective health assessments (e.g., wearable activity trackers) and evaluate the sustainability of community programs over time. Qualitative interviews could further explore psychological motivators and cultural shifts necessary for sustained physical activity engagement.

REFERENCES

1. Abbasi, I. N. (2014). Socio-cultural barriers to attaining recommended levels of physical activity among females: A review of literature. Quest, 66(4), 448-467. https://doi.org/10.1080/00336297.2014.955118
2. Abu Aqab, A., AL-Hussami, M., Almegewly, W., & Karavasileiadou, S. (2023). The Effects of Physical Activity on Health-Related Quality of Life Among Working Mothers Living in Amman: A Correlational Study. Journal of Multidisciplinary Healthcare, 16, 1989–2000. https://doi.org/10.2147/JMDH.S414826
3. Alazawa, Z. F. R., Barrouq, D. M., Irshaidat, T., & Ayassrah, N. E. S. (2024). A cross-sectional study for assessment of menopausal symptoms and coping strategies among Jordanian women in the 40-60 years age group. International Journal of Reproduction, Contraception, Obstetrics and Gynecology, 13(1), 7.
4. Alhroub, N., Al-Sarairhe, I., Awamleh, R. A., Ayasreh, I., Alkhawaldeh, A., ALBashtawy, M., ... & Alkhawaldeh, H. (2024). Physical Activity Barriers Among Adolescents in Jordan: A Cross-Sectional Study. SAGE Open Nursing. https://doi.org/10.1177/23779608241272688
5. Alnjadat, R., Momani, E. A., Etoom, M., Hamdan, F., & ALrub, S. A. (2024). Level of adherence to diet and physical activity among menopausal women and influencing factors in Jordan: a descriptive cross-sectional study. Frontiers in Public Health, 12, 1333102.
6. Benavidez, G. A., Zahnd, W. E., Hung, P., & Eberth, J. M. (2024). Chronic disease prevalence in the US: sociodemographic and geographic variations by zip code tabulation area. Preventing chronic disease, 21, E14.
7. Bernier, P., Vieira, M., & Revell, A. J. (2025). The Intersection of Menopause, Lack of Physical Activity, and Cardiovascular Risk. Nursing for Women's Health, 29(1), 63-70. https://doi.org/10.1016/j.nwh.2024.08.007
8. Beyer, K. M. M., Szabo, A., Hoormann, K., & Stolley, M. (2018). Time spent outdoors, activity levels, and chronic disease among American adults. Journal of Behavioral Medicine, 41(4), 494–503. https://doi.org/10.1007/s10865-018-9911-1
9. Booth, F. W., Roberts, C. K., & Laye, M. J. (2012). Lack of exercise is a major cause of chronic diseases. Comprehensive Physiology, 2(2), 1143–1211. https://doi.org/10.1002/cphy.c110025

10. Bull, F. C., Al-Ansari, S. S., Biddle, S., Borodulin, K., Buman, M. P., Cardon, G., ... & Willumsen, J. F. (2020). World Health Organization 2020 guidelines on physical activity and sedentary behaviour. British Journal of Sports Medicine, 54(24), 1451–1462.
https://doi.org/10.1136/bjsports-2020-102955
11. Chaabane, S., Chaabna, K., Abraham, A., Mamtani, R., & Cheema, S. (2020). Physical activity and sedentary behaviour in the Middle East and North Africa: An overview of systematic reviews and meta-analysis. Scientific Reports, 10(1), 1–24. https://doi.org/10.1038/s41598-020-66163-x
12. Chopra, S., Ranjan, P., Verma, A., Kumari, A., Malhotra, A., Upadhyay, A. D., ... & Vikram, N. K. (2022). A cross sectional survey of 504 women regarding perceived risk factors and barriers to following healthy lifestyle and association with sociodemographic factors and menopausal symptoms. Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 16(6), 102529.
13. Gill, Diane L. "Gender and cultural diversity in sport, exercise, and performance psychology." In Oxford research encyclopedia of psychology. 2017. https://doi.org/10.1093/acrefore/9780190236557.013.148
14. Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2018). Worldwide trends in insufficient physical activity from 2001 to 2016: a pooled analysis of 358 population-based surveys with 1· 9 million participants. The Lancet Global Health, 6(10), e1077-e1086.
15. Hybholt, M. (2022). Psychological and social health outcomes of physical activity around menopause: A scoping review of research. Maturitas, 164, 88-97. https://doi.org/10.1016/j.maturitas.2022.07.014
16. Hyvärinen, M., Juppi, H. K., Taskinen, S., Karppinen, J. E., Karvinen, S., Tammelin, T. H., ... & Laakkonen, E. K. (2022). Metabolic health, menopause, and physical activity—a 4-year follow-up study. International Journal of Obesity, 46(3), 544-554. https://doi.org/10.1038/s41366-021-01022-x
17. Khamaiseh, A. M., & Habashneh, S. S. (2024). Prevalence and associated factors of non-communicable chronic diseases among university academics in Jordan. PloS one, 19(8), e0304829. https://doi.org/10.1371/journal.pone.0304829
18. Khosromanesh, R., Dzioban, K., Turkmani, E. M., & Asadolai, A. (2023). Middle-aged women's perceptions and experiences of physical activity: a grounded theory approach. Physical Culture and Sport, 98(1), 39-56. https://doi.org/10.2478/pcssr-2023-0004
19. Khurmah, M. H. A., Alkhatatbeh, M. J., Alshogran, O. Y., & Alarda, H. M. (2024). Prevalence and risk factors of osteopenia and osteoporosis among postmenopausal women: A cross-sectional study from Jordan. Public Health Nursing, 41(5), 996-1005. https://doi.org/10.1111/phn.13379
20. Malkawi, A. M., Kremers, S. P., & Meertens, R. M. (2024). Motivation for physical activity in the Jordanian military: Possible determinants of physical activity in male and female recruits. Military Psychology, 1-12.
21. Mariam, A. A., & Mazin, H. (2019). Working experience and perceived physical activity and exercise barriers. Sport Mont, 17(2), 47-52.
22. Ministry of Environment, Jordan. (2023). National Strategy for Sustainable Development 2025. http://www.moenv.gov.jo
23. Salvo, D., Garcia, L., Reis, R. S., Stankov, I., Goel, R., Schipperijn, J., ... & Pratt, M. (2021). Physical activity promotion and the United Nations sustainable development goals: building synergies to maximize impact. Journal of Physical Activity and Health, 18(10), 1163-1180.
24. Shaaban Abdelgalil, M., El-Farargy, S. H., Dowidar, M. A., & Abd-ElGawad, M. (2025). Exploring socio-demographic determinants of obesity in Jordanian women of reproductive age: insights from a nationwide survey. BMC Public Health, 25(1), 394.
25. United Nations Country Team in Jordan. (2019). Meta-analysis on women's participation in the labour force in Jordan. UN Women Jordan. https://jordan.un.org/sites/default/files/2020-11/Meta_LR_021120%20%28003%29.pdf
26. Vincent, H. K., Raiser, S. N., & Vincent, K. R. (2012). The aging musculoskeletal system and obesity-related considerations with exercise. Ageing research reviews, 11(3), 361–373. https://doi.org/10.1016/j.arr.2012.03.002
27. World Health Organization (WHO). (2018). Global action plan on physical activity 2018–2030: More active people for a healthier world.
https://www.who.int/publications/i/item/9789241514187
28. World Health Organization. (2021). Global status report on physical activity 2021. World Health Organization. https://www.who.int/publications/i/item/9789240035904