JOURNAL OF INTERNATIONAL CRISIS AND RISK COMMUNICATION RESEARCH
ISSN: 2576-0017
2024, VOL 7, NO S12

Comparative Impact of Home Exercise Equipment on Physical Activity and Well-being among the Saudi Population

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ABSTRACT
Background: Physical inactivity has emerged as a significant global health concern. It is a known risk factor for several non-communicable diseases, including cardiovascular diseases, diabetes, and certain types of cancer. Global health guidelines recommend reducing sedentary time and incorporating various intensities of physical activity into daily routines. Home exercise equipment has been identified as a potential solution for reducing sedentary behaviors.
Methods: This study examined the effect of home exercise equipment on physical activity levels among the Saudi adult population and identified barriers to physical activity and potential solutions.A cross-sectional design was employed. Data were collected during a one-month period using a validated questionnaire distributed online throughout the Kingdom of Saudi Arabia. The estimated sample size was 910 participants at 80% power and a 99.9% confidence interval. The questionnaire asked about sociodemographic data, level of physical activity, ownership of home exercise equipment, and frequency of home exercise.
Results: Women accounted for two-thirds (64.8%) of participants, and the majority (92.8%) of participants were Saudi. Furthermore, 24.3% of participants indicated regular exercise at home, mostly cardio (69.5%) and strengthening (35.2%). Almost half (47.9%) of participants reported that they owned home exercise equipment, mostly treadmills (80.4%). Ownership of home exercise equipment was significantly higher among women (52.4%) than men (39.6%) and among those who had housemaids (53.7%).
Conclusions: A higher frequency of home-based exercise was influenced by a mixture of personal convictions, demographic characteristics, and tangible health outcomes. This changing fitness landscape suggests a need for more tailored interventions that consider culture-, gender-, and age-specific peculiarities.
Keywords: Home exercise, Physical Activity, Sport medicine, Life Style

INTRODUCTION

Physical inactivity has emerged as a significant global health concern. It is essential to understand the nature of physical activity to address the adverse outcomes associated with inactivity. The World Health Organization (WHO) defines physical activity as any bodily movement produced by skeletal muscles that requires energy expenditure; this encompasses activities performed for various reasons, such as recreation, transportation, or occupational requirements [1].The WHO advises adults aged 18–64 to engage in at least 150–300 minutes of moderate-intensity aerobic physical activity weekly, 75–150 minutes of vigorous-intensity activity weekly, or a combination of both to maintain good health [1].

The rise of sedentary lifestyles, largely due to increased motorized transportation and screen time for work and entertainment, is a growing global issue [1]. Animportant statistic from 2016 indicated that 27.5% of adults worldwide were not sufficiently active, a condition more prevalent among women (31.7%) and people in high-income countries (36.8%)[2]. These figures reveal a concerning gap in meeting the recommended levels of physical activity.

Physical inactivity has been increasingly recognized as a major contributor to global health burdens and thereforenecessitates urgent action [1]. It is a known risk factor for several non-communicable diseases, including cardiovascular diseases, diabetes, and certain types of cancer. Additionally, it contributes to the prevalence of obesity and hypertension and negatively impacts mental health by increasing the risks of conditions such as depression and anxiety [1]. To counteract these risks, global health guidelines recommend reducing sedentary time and incorporating various intensities of physical activity into daily routines [1].The prevalence of obesity, a direct consequence of physical inactivity, is alarmingly high. The WHO categorizes individuals with a body mass index (BMI) over 25 as overweight and those with a BMI over 30 as obese [3]. According to the Global Burden of Disease Study in 2019, being overweight or obese was a major risk factor by contributing to approximately 5 million deathsdue to many non-communicable diseases, such as cardiovascular diseases, diabetes, cancers, neurological disorders, chronic respiratory diseases, and digestive disorders[3]. A 2020 study indicated that, in Saudi Arabia, the obesity rate (BMI over 30) was 24.7%, with a strong correlation between obesity and various chronic diseases [4]. Saudi Arabia ranks 12th among the top 30 obese countries worldwide, with a 35.4% rate of obesity in its population[5]. This trend is attributed to recent dietary changes, such as the increased consumption of fast food and challenges in managing portion sizes, alongside the barrier of physical inactivity, which is often due to extreme weather conditions.Despite global efforts, a comprehensive review of studies from 168 countries indicated that there has been no significant reduction in physical inactivity from 2001 to 2016, casting doubt on our ability to achieve the 2025 global target of a 10% reduction in inactivity [2]. This underscores the need for targeted health promotion programs and research to understand and address the barriers to physical activity, particularly in women.

Research within Saudi Arabia has highlighted key barriers to physical activity, including extreme weather and limited time, especially among young adults and college students[7–9]. Additionally, there is a notable lack of facilities, which particularly impactsphysical activity rates in women[10]. Home-based exercises, with or without equipment, have been proposed as viable alternatives to overcome these barriers.

Home exercise equipment has been identified as a potential solution for reducing sedentary behaviors [15]. This suggests that furnishing homes with exercise equipment could be a key strategy in increasing physical activity among women.Saudi Arabia has experienced some major changes in the last 5 years due to the implementation of Saudi Vision 2030. This includes support for women's sports by licensing more women's gyms; creating a friendly, supportive outdoor environment; and investing in sports competitions across the country. The impact of this governmental support on physical activity in the adult population has not yet been studied thoroughly. In addition, gaps in the knowledge of barriers to physical activity have been noted in countries neighboring Saudi Arabia, such as Oman, Kuwait, Qatar, and Emirates[16]. This further highlights the need for additional research at a regional level to better understand this issue and implement a definitive solution.This study, therefore, sought to examine the effect of home exercise equipment on physical activity levels among the Saudi adult population while also considering the identified barriers to physical activity and potential solutions.

METHODS:

Objectives

The objectives of this study are threefold: First, to evaluate the impact of home exercise equipment on physical activity levels among the Saudi adult population. Second, to identify the barriers that prevent regular physical activity in this demographic. Finally, to investigate the gender and demographic differences in the use of home exercise equipment among Saudi adults.

Study date and duration

The questionnaire was distributed and responses were collected in a one-month period Between mid of November to mid of December 2023)

inclusion and exclusion criteria

For this online survey, the inclusion criteria require participants to be adults, specifically 18 years or older. All participants must have reliable access to the internet, as the survey will be administered online. Additionally, they must possess the ability to understand the survey content andknowing their freedom to choose to participate or not. Finally, since this is a snowball sampling technique, participants should be willing to refer other eligible adults within their social circles to partake in the survey.

Exclusion criteria focus on individuals who do not meet the minimum age requirement. Any individual who fails to fully understand the survey content will be excluded from participation. To ensure the validity of responses,

participants who have already taken the survey, either intentionally or unintentionally, will be excluded to avoid duplicate data. Language proficiency is a key exclusion criterion, as those unable to speak or read the language of the survey (Arabic and English) will not be able to participate effectively. Lastly, any surveys that are not fully completed or have substantial missing information will be excluded from the final analysis.

Study Tool

The study design was cross-sectional. The Google Docs platform was used to design and disseminate an online questionnaire through social media applications (Twitter and WhatsApp) to achieve snowball sampling of participants from across the country. The comprehensive questionnaire was designed based on multiple studies and was divided into three major parts. The first part included demographic data to determine the baseline characteristics of our population to serve as independent variables. These included age, gender, educational level, nationality, marital and working statuses, and additional details about socioeconomic status that are relevant to Saudi society, such as number of children and having a housemaid. The second part was designed for people who owned home exercise equipment. These questions were about the type of equipment (supported by pictures), pattern of use, and incentives or obstacles affecting adherence to regular equipment use. Participants who did not have any kind of home exercise equipment skipped part two of the questionnaire and went directly to part three, which included questions about the reasons and obstacles preventing people from owning home exercise equipment.

Validity of the Questionnaire

Content validity: Since the study was descriptive and was based on a literature review, multiple variables that may directly or indirectly affect the decision to own home exercise equipment were listed. In addition, some variables related to local culture that may affect such a decision were added.

Construct validity: The study was carefully designed, and, to make it easy for participants to follow a logical sequence, the questionnaire was divided into three sections. The first section asked for demographical data and was completed by all participants. The second section was for participants who answered “yes” to the most important question in the study (“Do you own a home exercise device?”) and included questions about participants’ behavior toward home exercise equipment and their patterns of use. The third section was for people who did not own home exercise equipment.

Face validity: This study ensured that the questions were simultaneously neutral, direct, and non-leading. The multiple-choice questions covered all possible options. In addition, an “other” option was added to most questions that may have needed additional answers.

Sample Size

The population of the Kingdom of Saudi Arabia is approximately 32million, according to the latest census in 2023[17]. Moreover, according to the health survey issued by the Saudi General Authority of Statistics in 2021, only 30% of Saudis exercise 2.5 hours per week [17]. These statistics were usedto estimate the sample size using Epi Info 7 software.The estimated sample size was 910 participants at 80% power and a 99.9% confidence interval.

Study Tool

The questionnaire was designed after reviewing similar studies that had been conducted on the same topic [6,11–13,15,16]. We held an online meeting to discuss these studies and to choose the most relevant questions, which were customized for the local cultural context. After reaching agreement, the well-constructed online questionnaire was disseminated using the Google Docs platform. The questionnaire consisted of two parts: one to gather sociodemographic data and another to assess criteria such as age, education, level of physical activity, ownership of home exercise equipment, and frequency of home exercise.

Analysis plan

The analysis plan will involve several key steps. First, descriptive statistics will be used to summarize the demographic characteristics of the participants, including age, education level, income, and other relevant socio-economic factors. Additionally, the frequency and types of sports machines owned by participants will be analyzed, along with measures of physical activity levels (e.g., frequency, duration, and type of exercise) and self-reported well-being (using validated questionnaires or scales).

Next, inferential statistical analyses will be conducted to explore the relationships between owning sports machines at home and levels of physical activity and well-being. Specifically, chi-square tests and t-tests (or Mann-Whitney U tests for non-normally distributed data) will be used to compare physical activity levels and well-being scores between women who own sports machines and those who do not. Correlation and regression analyses will be employed to assess the strength and direction of these relationships, adjusting for potential confounding variables such as age, income, and pre-existing health conditions. Multiple regression models may be used to examine whether the presence of sports machines at home predicts higher physical activity and better well-being after accounting for these covariates.

Finally, subgroup analyses may be conducted to explore whether the impact of owning sports machines on physical activity and well-being differs across demographic groups (e.g., age brackets, income levels, or exercise habits). Statistical significance will be set at $p < 0.05$, and results will be presented with confidence intervals and effect sizes to provide a comprehensive understanding of the study findings. Data will be analyzed using SPSS

Results

Of all surveyed participants ($n = 1057$), women accounted for almost two-thirds (64.8%), and the overwhelming majority were Saudi (92.8%). Their mean age (± SD) was 37.4 ± 11.3 years. Most of the participants had either university qualifications (52.0%) or postgraduate degrees (22.1%). The employed individuals constituted 65.3% of participants, and housewives accounted for 19.3%. Most participants were married (63.5%), and 62.4% had children. Slightly less than one-half (45.3%) reported that they had a housemaid**(Table 1)**.

Regarding the performance of physical exercise, less than one-quarter of participants (23.5%) indicated that they were enrolled in a gym activity, and a similar percentage (24.3%) indicated that they were regularly exercising at home, mostly performing cardio (69.5%) and strengthening (35.2%) exercises. Almost one-half (47.9%) of participants reported that they owned home exercise equipment, mostly treadmills (80.4%), stationary bikes (48.8%), and dumbbells (48.4%). The most important factors that encouraged them to own home exercise equipment were personal conviction (72.1%), the influence of friends and relatives (20.4%), and medical advice (12.8%). However, the percentage of participants who used this equipment daily was only 6.7%,while 28.5% used it several times weekly and 14% used it once weekly. The most important factors encouraging use of home exercise equipment included ease of use (44.7%), saving time compared to outdoor activities (45.8%), saving money (29.1%), and the availability of a wide variety of exercises (14.8%) **(Table 2)**.

Ownership ofhome exercise equipment was significantly higher among women (52.4%) than men (39.6%) and among those who had housemaids (53.7%) than those who did not (43.2%;$p < 0.05$). Meanwhile, although the percentages of participants who owned exercise equipment were higher for Saudis (48.2%), people aged 50 years or older (55.4%), those with postgraduate degrees (54.1%),those who were married (48.1%), and those who were retired (54.1%), these differences were not statistically significant ($p > 0.05$)**(Table 3)**.

Differences in the regular practice of home exercise according to characteristics of the study group are shown in **Table 4**.It was evident that regular home exercise was significantly higher among women (26.7%) than men (20.2%) and among married individuals (26.9%) than unmarried individuals (22.9%;$p < 0.05$). In contrast, the regular practice of home exercise did not differ statistically ($p > 0.05$) according to nationality, age, educational level, employment status, having children, or having a housemaid.

Furthermore, **Fig. 1** displays differences in the regularity of home exercise according to ownership ofhome exercise equipment.It was evident that the percentage of participants who reported regular home exercise was almost doubled among those who owned home exercise equipment (33.2%) compared to those who did not (16.1%;$p < 0.05$).

When the respondents were asked to describe the perceived changes in their general health in response to home exercise, a majority indicated that they became more physically active (62.1%), feltan improvement in their general health (58.9%), felt more energetic (30.6%), sleptbetter (27.4%), became less stressed (27.6%), and even lost weight (40.5%).

Table1 Characteristics of the study group ($n = 1057$)

Characteristics	*N*	Percentage
Gender:		
Male	372	35.2
Female	685	64.8
Nationality:		
Saudi	981	92.8
Non-Saudi	76	7.2
Age categories:		
<30 years	272	25.7
30 to <40 years	348	32.9
40 to <50 years	268	25.4
≥50 years	169	16.0
Mean ± SD	37.4 ± 11.3 years	
Educational level:		
High school	274	25.9
University qualification	550	52.0

Postgraduate	233	22.1
Employment status:		
Employed	690	65.3
Housewife	204	19.3
Student	102	9.6
Retired	61	5.8
Marital status:		
Married	671	63.5
Not married	386	36.5
Have housemaid:		
Yes	479	45.3
No	578	54.7
Have children:		
Yes	660	62.4
No	397	37.6
Average number of children; median (IQR)	2(0–4)	

Table2 Patterns of home exercise practiced by the study group

Patterns of exercise	*N*	Percentage
Currently enrolled in gym:		
Yes	248	23.5
No	809	76.5
Practicing any exercise at home:		
No	384	36.3
Yes	257	24.3
Sometimes	416	39.4
Type of exercises performed at home (n = 673):		
Cardio	468	69.5
Strengthening	237	35.2
Yoga	64	9.5
Own any home exercise equipment:		
Yes	506	47.9
No	551	52.1
Types of exerciseequipment owned (n = 506):		
Treadmill	407	80.4
Stationary bike	247	48.8
Dumbbells	245	48.4
Air walker	76	15.0
Punching bag	34	6.7
Home gym system	31	6.1
Vibration platform	14	2.8
Multifunctional trainer	11	2.2
Stepper machine	10	2.2
Factors encouragingownership of home exercise equipment (n = 506):		
Doctor's advice	65	12.8
Friends and relatives	103	20.4
Advertising	28	5.5
Social media	39	7.7
Personal conviction	365	72.1
Factors encourage use ofhome exercise equipment (n = 506):		
Ease of use	226	44.7
Saving time	232	45.8
Saving money	147	29.1
Variety of exercises	75	14.8
Frequency of use of home exercise equipment (n = 506):		
Once daily	34	6.7
Several times weekly	144	28.5
Once weekly	71	14.0
Rarely	200	39.5
Never	57	11.3

Table3 Ownership of home exercise equipment according to characteristics of the study group

Characteristics	Own home exercise equipment		χ^2	*p**
	Yes	No		
	N(%)	*N*(%)		
Gender:				
Male	147(39.6)	224(60.4)	15.765	<0.001**
Female	359(52.4)	326(47.6)		
Nationality:				
Saudi	472(48.2)	508(51.8)	0.332	0.565
Non-Saudi	34(44.7)	42(55.3)		
Age categories:				
<30 years	135(49.6)	137(50.4)	6.399	0.094
30 to <40 years	153(44.0)	195(56.0)		
40 to <50 years	125(46.6)	143(53.4)		
≥50 years	93(55.4)	75(44.6)		
Educational level:				
High school	125(45.8)	148(54.2)	4.571	0.102
University qualification	255(46.4)	295(53.6)		
Postgraduate	126(54.1)	107(45.9)		
Employment status:				
Employed	318(46.2)	371(53.8)	3.365	0.339
Housewife	100(49.0)	104(51.0)		
Student	55(53.9)	47(46.1)		
Retired	33(54.1)	28(45.9)		
Marital status:				
Married	185(48.1)	200(51.9)	0.004	0.947
Not married	321(47.8)	350(52.2)		
Have housemaid:				
Yes	257(53.7)	222(46.3)	11.560	0.001**
No	249(43.2)	328(56.8)		

**Based on chi-square test*
***Statistically significant*

Table4 Practice of home exercise according to characteristics of the study group

Characteristics	Practice exercise			χ^2	*p**
	Yes	No	Sometimes		
	N(%)	*N*(%)	*N*(%)		
Gender:					
Male	75(20.2)	149(40.2)	147(39.6)	6.759	0.034**
Female	182(26.7)	231(33.9)	269(39.4)		
Nationality:					
Saudi	236(24.2)	355(36.3)	386(39.5)	0.580	0.748
Non-Saudi	21(27.6)	25(32.9)	30(39.5)		
Age categories:					
<30 years	76(27.9)	88(32.4)	108(39.7)	8.649	0.194
30 to <40 years	79(22.8)	123(35.4)	145(41.8)		
40 to <50 years	57(21.3)	113(42.3)	97(36.3)		
≥50 years	45(26.9)	56(33.5)	66(39.5)		
Educational level:					

High school	75(27.5)	95(34.8)	103(37.7)	2.664	0.616
University qualification	131(23.9)	195(35.6)	222(40.5)		
Postgraduate	51(22.0)	90(38.8)	91(39.2)		
Employment status:					
Employed	151(22.0)	269(39.0)	269(39.0)	11.971	0.063
Housewife	54(26.6)	64(31.5)	85(41.9)		
Student	31(30.7)	30(29.7)	40(39.6)		
Other	21(35.0)	17(28.3)	22(36.7)		
Marital status:					
Married	104(26.9)	118(30.6)	164(42.5)	8.118	0.017**
Not married	153(22.9)	262(39.3)	252(37.8)		
Have housemaid:					
Yes	116(24.3)	191(40.0)	170(35.6)	0.632	0.532
No	141(24.5)	189(32.8)	246(42.7)		
Have children:					
Yes	157(23.9)	251(38.3)	248(37.8)	3.715	0.156
No	100(25.2)	129(32.5)	168(42.3)		

**Based on chi-square test*
***Statistically significant*

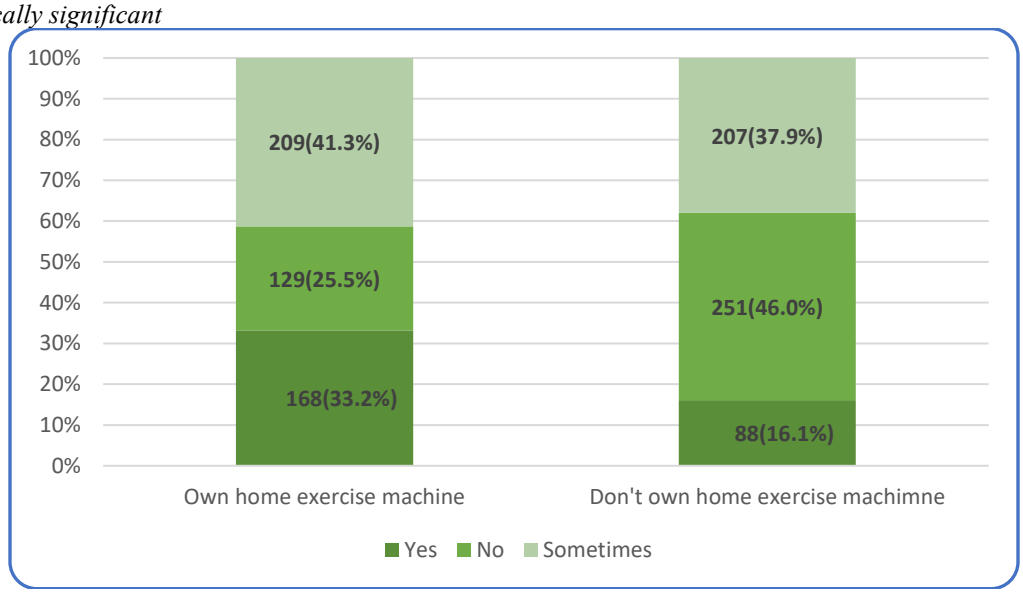

Fig. 1 Regular practice of home exercise among participants who owned and did not own home exercise equipment

Table5 Impacts of using home exercise equipment

Changes in physical fitness and general health	*N*	Percentage
Impact on physical fitness (n = 422):		
Became more physically active	262	62.1
No change in physical activity	122	28.9
Became less physically active	38	9.0
Impact on general health (n = 457):		
Felt better in general	269	58.9
Felt more energetic	140	30.6
Slept better	125	27.4
Became less stressed	126	27.6
Became more muscular	97	21.2
Lost weight	185	40.5

Discussion

Frequency of Home-based Exercise and Demographic Characteristics

In Saudi Arabia, a national survey estimated that 66.6% of the population is physically inactive, with a higher rate observed in women (72.9%) than men (60.1%) [6]. However, home exercises seem to be increasing among the Saudi population, as evidenced by our findings. A substantial percentage of our study group, which predominantly consisted of women (64.8%), engaged in some form of home-based exercise. Such a finding contrasts with general trends, in which men tend to be more active [2]. Other studies evaluated in a systematic review by Al-Hazzaa[18] found that women may participate lessin outdoor activities. It is possible that home-based exercises, which provide privacy and flexibility, resonate more with women, particularly in culturally nuanced settings like Saudi Arabia [3].

The majority of study participants were Saudi (92.8%), which is very similar to other national studies published in the last decade [18]. The 30–40 age group showed the highest engagement in home-based exercise, suggesting that mid-adulthood, possibly a period of increased health consciousness, could be critical for interventions.

Patterns of Home-based Exercise and Equipment Ownership

Studies have shown that home-based exercise programs can be more effective in fostering long-term adherence than center-based programs [11]. Moreover, to assess the effect of home equipment availability on level of physical activity, two trials found that increasing the availability of facilities and home equipment was associated with a significant increase in physical activity [12]. The datademonstrated a fascinating trend, as the vast majority of participants (76.5%) did not have current gym memberships. Such an inclination toward home workouts could have been exacerbated by global shifts in exercise behaviors, especially during events like the COVID-19 pandemic [1].

The data presented show that ownership of treadmills was common among the population and that cardio exercises predominated. This further bolsters the perspective that aerobic activities might preferred by many people,possibly due to their vast array of benefits, including improvedcardiovascular health and weight management.

Moreover, the variety of equipment reported,from dumbbells to multifunctional trainers,suggeststhat many people seek diverse workout routines that integrate strength training, flexibility, and balance exercises.

Motivations and Outcomes of Home-based Exercise

The fact that personal conviction was the primary motivator for both purchasing and utilizing home exercise equipment suggests a paradigm shift. It indicates an internalized understanding of fitness benefits rather than the importance of extrinsic factors like social pressure or fleeting trends [6].

The tangible benefits of exercise are difficult to overlook. A majority of participants felt an increase in their physical activity levels, and the subsequent impact on general health is promising. Feelings of enhanced well-being, increased energy, improved sleep, and significant weight loss strengthen the argument for home exercise as a potent tool for improving holistic health [4].

Influences on Home Exercise Practices

Another cross-sectional study addressing the effect of the availability of home exercise equipment and proximity to exercise facilities among young adults, especially university students, found that the amount of home exercise equipment was significantly associated with the intensity, duration, and frequency of physical activity, while proximity to an exercise facility was significantly associated with the intensity and duration of physical activity [13]. Interestingly, moderate physical activity at home has also been linked to improved sleep quality [14].Our study delved into demographic characteristics andfoundstatistically significant correlations between ownership ofhome exercise equipment and both female gender and having a housemaid.The latter is a socioeconomic factor that might influence fitness decisions. However, only female gender and being married significantly predicted the regular practice of home exercise, while other factors, including having a housemaid, were not significant predictors.

It can be concluded that gender dynamics play a pivotal role in influencing the ownership of home exercise equipment and practicing regular home exercise. Men lagged behind women in terms of home workout patterns, suggesting that the dynamics of home workouts might differ fundamentally from those of traditional exercise settings [3]. This was also noted in Al-Hazzaa's[18]systematic review, which found that men preferred public exercise areas as well as engaging in physical activities with friends over home-based workouts alone.

Diverse Exercise Patterns among Different Subgroups

A systematic review found that the presence and quantity of home exercise equipment significantly predicted physical activity, especially among women [15]. Younger participants, particularly those under 30, showcased an intriguing blend of enthusiasm and inconsistency. While they showed keen interest in home workouts, they also featured prominently in the "sometimes" exercise category, suggesting a sporadic pattern[2]. Additionally, lifestyle stages like pursuing higher education or retirement significantly influenced exercise behaviors. Students, for example, oscillated between high engagement and inactivity, possibly mirroring the erratic nature of academic pressures.In contrast, those who have reached the age of retirement find themselves with more leisure time and

without the stresses of work life. Theseindividuals might therefore exhibit a higher frequency of physical activity due to having more leisure time. They also show a more consistent pattern of engaging in physical activity on a regular basis [2].

Limitation

We use of a non-random snowball sample, as participants are self-selected, which may introduce selection bias. Individual who are more engaged with physical activity or health-related topics may be more likely to participate, skewing the results. Furthermore, the cross-sectional design only captures data at one point in time, preventing any conclusions about causality or the direction of the relationships observed.Additionally, conducting the survey online excludes individuals without internet access or digital literacy, potentially limiting the diversity of the sample.

Conclusion

Our exploration highlights the rising prominence of home-based exercise, which was influenced by a combination of personal convictions, demographic characteristics, and tangible health outcomes. In the Saudi population, gender differences played a crucial role in determining whether individuals practiced regular home exercise:womenexercised at home more than men due to multiple cultural and environmental factors. This changing fitness landscape highlights a need for more tailored interventions and more research on barriers to exercise while consideringgender as well as psychological, cultural,and environmental factors.

Disclosures

Author Contributions

[Abdullatif A. Almarashi]: Conceptualization of the study, study design, and supervision of the project. Played a primary role in drafting and revising the manuscript.

[Noor S. Alharbi]: Contributed to the development of the research methodology, statistical analysis, and validation of data. Assisted in drafting the manuscript and interpreting the results.

[Ghassan A. Murshid]: Led the data collection process and managed the research instruments. Also contributed to data interpretation and assisted in writing sections related to the methodology and results.

[Mariann H. AlJehani]: Provided technical expertise and was responsible for the software and tools used for analysis. Reviewed and edited the manuscript for technical accuracy.

[Abdulrahman A. Alghamdi]: Assisted with literature review, contributed to the development of the survey, and participated in the data collection process. Helped in revising the manuscript's discussion section.

[Fawaz H. Alharthi]: Contributed to the acquisition of funding and resources for the study. Provided critical feedback and contributed to the theoretical framing of the research.

[Mohammad A. Kareem]: Conducted the formal analysis, validated the data, and reviewed the statistical methods. Played a role in drafting the results and ensuring accuracy in interpretation.

[Fahad S. Alghamdi]: Involved in the administration of the survey and data management. Assisted in reviewing and editing the final manuscript for important intellectual content.

Ethics Statement

The study was approved by the ethical committee of Jeddah Health Affairs with IRB no (A01726). In the first part of the questionnaire, the authors were identified, and participants' rights were stated. At the end of the questionnaire, participants were informed that an email address would be provided in case participants had any inquiries about unclear questions or if they wished to withdraw from participation. Additionally, participants were informed that no names would be recorded on the questionnaires and that all personal information of participants would be kept confidential.

Consent for publications

All authors involved in this study have read and approved the final version of the manuscript. Each author consents to its publication and agrees to be accountable for all aspects of the work, ensuring that any questions related to the accuracy or integrity of the study are appropriately investigated and resolved.Furthermore, all participants involved in the study were informed that the results of the research might be published and provided their consent for publication. Any data used in the publication is presented in aggregate form, ensuring the privacy and confidentiality of participants are fully protected.

Data Availability

The data that support the findings in this studyare available from the corresponding author upon reasonable request. Due to privacy and ethical concerns, individual-level data are not publicly available to protect the confidentiality of the participants. However, aggregated data and the relevant supporting materials used in the analysis are available to qualified researchers who meet the criteria for access to confidential data and upon approval by the ethical committee of Jeddah Health Affairs with IRB no (A01726)

Funding

The study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Acknowledgements

The authors would like to express their sincere gratitude to all the participants who took the time to contribute to this study. Additionally, we thank Research and Study Department in Health Affairs of Jeddah Province for their support and assistance during various stages of this research. Finally, we acknowledge the valuable feedback provided by Dr Adel Ibrahim in improving the quality of this work.

Conflict of interest

We declare that we have no conflicts of interest. We have no financial or non-financial relationships with any companies or organizations that might benefit from the results of this research. There are no competing interests that could have influenced the design, conduct, or interpretation of this study.

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Table legend

Table 1. Characteristics of the study group (n = 1057).This table presents the demographic characteristics of the study participants, including gender, nationality, age categories, educational level, employment status, marital status, housemaid presence, and the presence of children. The distribution of participants across these characteristics is shown as both the number (N) and percentage (%) of the total study population. For the age variable, the mean age and standard deviation (SD) are provided, and the average number of children is expressed as the median with interquartile range (IQR). The table gives an overview of the study population's socio-demographic profile.

Table 2: Patterns of home exercise practiced by the study group. This table provides an overview of the exercise habits and ownership of home exercise equipment among the study participants. It details the number and percentage of participants currently enrolled in a gym, practicing exercise at home, and the types of exercises performed at home. Among those exercising at home, the most common types of exercises, such as cardio, strengthening, and yoga, are listed. The table also highlights the ownership of home exercise equipment, specifying the types of equipment owned by participants and the factors encouraging their ownership, such as personal conviction or social influences. In addition, it outlines the reasons for using home exercise equipment, such as saving time or ease of use, and reports the frequency of equipment use among participants. The data presented offers a comprehensive view of exercise patterns within the study group.

Table 3: Ownership of home exercise equipment according to characteristics of the group.This table presents the association between various demographic and lifestyle characteristics and ownership of home exercise equipment among the study participants. The table compares the number (N) and percentage (%) of participants who own or do not own home exercise equipment based on gender, nationality, age categories, educational level, employment status, marital status, and whether they have a housemaid. The results of chi-square (χ^2) tests are provided to indicate statistical significance, with corresponding p-values. Statistically significant differences were observed in ownership based on gender and whether the participant has a housemaid. A p-value less than 0.05 indicates statistical significance, with $p < 0.001$ highlighting highly significant results. This table provides insights into the socio-demographic factors influencing the ownership of home exercise equipment within the study group.

Table 4: Table 4. Practice of home exercise according to characteristics of the group.This table explores the relationship between participants' demographic characteristics and their practice of home exercise. The table displays the number (N) and percentage (%) of participants who report practicing home exercise regularly, not at all, or sometimes, categorized by gender, nationality, age, educational level, employment status, marital status, housemaid presence, and children. The results of chi-square (χ^2) tests are provided to assess the statistical significance of the relationships between these characteristics and exercise habits. Significant associations were found for gender ($p = 0.034$) and marital status ($p = 0.017$), indicating that these factors are significantly related to home exercise practice. Other characteristics did not show statistically significant associations. A p-value less than 0.05 is considered statistically significant. This table helps illustrate the exercise patterns in relation to the socio-demographic profiles of the study participants.

Table 5: Impacts of using home exercise equipment.This table presents the reported impacts of using home exercise equipment on participants' physical fitness and general health. The table summarizes the number (N) and percentage (%) of participants who experienced changes in their physical activity levels and various aspects of their health. Among those who reported changes in physical fitness, the majority (62.1%) indicated they became more physically active, while 28.9% saw no change, and 9.0% became less physically active. For general health impacts, the most common benefits included feeling better overall (58.9%), feeling more energetic (30.6%), improved sleep (27.4%), reduced stress (27.6%), increased muscle mass (21.2%), and weight loss (40.5%). These findings provide insight into how using home exercise equipment can affect both physical and mental well-being.

Figure Legends:

Figure 1: Comparison of home exercise practices between participants who own and do not own home exercise machines.This stacked bar chart shows the percentage distribution of participants based on their practice of exercise at home, categorized by whether they own a home exercise machine. The chart highlights three categories: participants who regularly exercise at home (Yes), those who do not exercise at home (No), and those who sometimes exercise at home (Sometimes). Among participants who own a home exercise machine, 33.2% regularly exercise, 25.5% do not exercise, and 41.3% sometimes exercise. In contrast, among participants who do not own a machine, 16.1% regularly exercise, 46.0% do not exercise, and 37.9% sometimes exercise.