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Walking status in Saudi Arabia

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Abstract

Walking is one of the most effective strategies for maintaining good health. Prior research has indicated that there were a high number of inactive people in Saudi Arabia. Additionally, there is a gap in research on walking statistics and the potential barriers to physical activity and walking in Saudi Arabia in recent years. As such, the aim of this study was to determine if there are more inactive people than previous research has shown among the population of Saudi Arabia. This research was conducted using a survey, which included questions about participants' walking habits and potential factors influencing them, distributed by a survey link across the KSA, covering its geographical regions. The questionnaire was advertised on social networking sites (Facebook, WhatsApp, and Telegram) between April 2022 and May 2022, and 1,300 people completed the survey. More people reported actively participating in walking in this study than in prior studies, with more than half of all participants (56%) actively walking. Specifically, 57% of male respondents and 43% of female respondents make up this group of active walkers. High frequency of walking corresponded with nonsmoking and overweight or obese participants, according to multivariate regression analysis ($p < 0.5$). A chi-square test also revealed that women and people between the ages of 18 and 30 are substantially more likely to be inactive ($p < 0.5$). In our study, social media and family were found to be the two major sources of information on walking and motivation to walk. The primary barriers to walking participation were reported to be a lack of locations to walk, extreme temperature changes, and a lack of companions and time. Population-based interventions are required to address these identified barriers to walking and physical activity. This conclusion aligns with the goals of the WHO Global Action Plan 2018–2030, which supports opportunities for physical activity and walking in public spaces and engages entire communities in the process.

Keywords: Walking, physical activity, Saudi Arabia, survey

Introduction

Walking is the best form of physical activity for many people because it is easy, free, and requires no training (Patel *et al.*, 2018) ^[12]. It is socially egalitarian, economically viable, and environmentally friendly (Bertolini & Le Clercq, 2003) ^[6]. Walking is also the most popular form of exercise recommended by medical doctors and evidence-based literature. Several guidelines recommend that, to achieve optimal health, adults should engage in more than 150 min of moderate-intensity physical activity or 75 min of vigorous-intensity physical activity per week (Yang, 2019; Peterson, 2022) ^[23, 13]. It has been identified that walking is a physical activity that associated with a significant reduction in the risk of heart disease, diabetes, breast cancer, and colon cancer. Moreover, when compared to inactivity, regular walking, even at lower levels than the minimum recommended level for physical fitness, is linked to lower all-cause mortality (Peterson, 2022). ^[13]

In line with these facts, the WHO Global Action Plan 2018–2030 supports the creation of active people, active societies, active environments, and active systems. It identifies rich opportunities for all people to be active in public settings and involves entire communities in physical activity and walking (GAPPA, 2018) ^[9]. Global physical activity levels, including walking, vary widely between countries. In 2017, a global large-scale analysis was performed using data, obtained from smartphones, on the physical activity of 717,527 people; countries such as Japan and the United Kingdom showed a relatively high level of walking, with an average of 6,000 daily steps, whereas countries such as Libya and Saudi Arabia showed a lower level of walking, with an average of 3,500 daily steps (Althoff *et al.*, 2017) ^[3]. This global study also reported that reduced activity in female individuals contributed to most of the observed low activity and then toward activity inequality.

In Saudi Arabia, a national survey of 4,758 participants, aged between 15 and 64 years, was conducted in different areas in the Kingdom in 2005.

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Part of this survey explored levels of physical activity in the Saudi population. This survey reported a high level of physical inactivity in various regions and demographics. For example, 66.6% of male participants and 72.9% of female participants were found to be inactive. Additionally, the northern and central regions of Saudi Arabia reported higher inactivity levels than other regions. In this research, physical activity was assessed using the Global Physical Activity Questionnaire (Al-Zalabani *et al.*, 2015) [4].

Moradi and colleagues studied 10,753 survey responses from people over 15 years of age at a national level in Saudi Arabia. They identified that the level of physical activity, including walking, among the study population was very low. They validated the use of statistical analysis using the logistic regression model as a feasible approach to identifying possible associations between variables in the study.

In terms of social networking-based questionnaires, Sudha and colleagues analyzed 103 responses to questionnaires that were sent out to adult participants aged between 18 and 25 years. Their sample was recruited using social networking sites such as Twitter and WhatsApp, and the response rate was very high. They identified that the use of an online survey to report physical activity and walking was fruitful.

With regard to barriers and information sources surrounding walking, a global research study analyzed data on 680,255 participants in Australia, Ireland, and the United Kingdom aged 16 years and above, and it revealed that the main barriers for those who did not participate in walking events within two years (2017–2019) were: inconvenient timing, lack of time, a feeling of unfit, injury or illness, and childcare obligations (Reece, 2022) [21]. Similarly, in a systematic review that examined perceived barriers to active living in Saudi Arabia, crowded traffic, extreme weather, cultural barriers, lack of social support, and lack of time and resources were found to be common barriers to walking (Al-Hazzaa, 2018) [2].

However, as there has been limited examination of the current walking statistics and obstacles in Saudi Arabia, it is worthwhile to attempt a survey study of walking in the country. As such, it was the purpose of this study to examine the current conditions of walking as exercise in a sample of the resident population of Saudi Arabia.

Rational and Public Health Implication

Inactivity is well known to raise the risk of chronic diseases such as diabetes and hypertension, and has a negative impact on public health as well as a major economic burden in Saudi Arabia and around the world (WHO, 2018) [22]. Therefore, exploring the walking level (as an activity indicator) at a national level could be a major public health indicator.

Despite Saudi Arabia's efforts and progress in promoting a healthy lifestyle, walking and physical activity remain underreported, and chronic diseases are considered as a major public health issue (WHO, 2018) [22]. As a result, this research is to learn more about walking status and potential barriers to walking. This study may also identify the need for national public health departments to implement plan aimed at removing barriers to walking.

Methods

A cross-sectional design was selected for this study. The sample was recruited from the general population living in Saudi Arabia aged 18 years and more. The sample size was estimated at 384 subjects, using the equation:

$$n' = \frac{n}{1 + \frac{z^2 \times \hat{p}(1-\hat{p})}{\epsilon^2 N}}$$

A questionnaire was advertised on social networking sites (including Facebook, WhatsApp, and Telegram) through a survey link. The questionnaire was completed by 1300 participants between April 2022 and May 2022.

The questionnaire design process in this study was based on five components: “research questions, research variables, data analysis, validity, and reliability” (Elangovan & Sundaravel, 2021) [7]. The structure of this questionnaire was intended to collect data on levels of walking as well as the potential barriers to walking. Three levels of walking were categorized as: optimal walking (30 min or above per day for 5 days a week); sub-optimal (walking for less than 5 days or less than 150min a week); and no walking. Moreover, some parts of the questionnaire were adopted from the International Physical Activity Questionnaire (IPAQ). In addition, potential barriers were explored, using the questionnaire, on 3 levels: physical, individual, and social factors (Hagströmer, 2006) [10]. The questionnaire included two main sections: Demographics (9 questions) and walking statistics and other factors, including the potential barriers and source of information about walking (8 questions). This questionnaire was verified at external validation including (literacy, time, compliance with the study objectives, and consistency) with non – participants before commencing the study. The pilot study was conducted with 10 individuals in the final stage of the questionnaire.

Demographic data included age groups, gender, nationality, employment status, Saudi territories, BMI levels, smoking status, and long-term health conditions. Walking status was reported by self-report using the question: “In the last 7 days have you walked for 30 min or more?” somewhere outside your home? (This includes walking for exercise or to reach a destination like the shops, school, mosque, or workplace). Other questions asked participants to choose or state reasons preventing participants from walking, and sources of information and motivation for walking.

For statistical analysis, categorical variables were described using frequencies. Tables and figure were used to describe a summary of the descriptive data. For the comparative analysis between participant groups, the Chi-squared χ^2 test and logistic regression were employed to examine relationships between (the categorical variables): the walking status and predictor variables. Statistical significance was set at $p < 0.05$, two-sided with a confidence interval at 95%. Data was analyzed using SPSS version 28. Ethics approval was obtained from the Ethics Research Committee at xxxxxx. (No. XXXX; Date: XXXX). All data in this research are anonymous and no disclosure of information related to participants. online pages of consent and information were provided as appropriate to all participants.

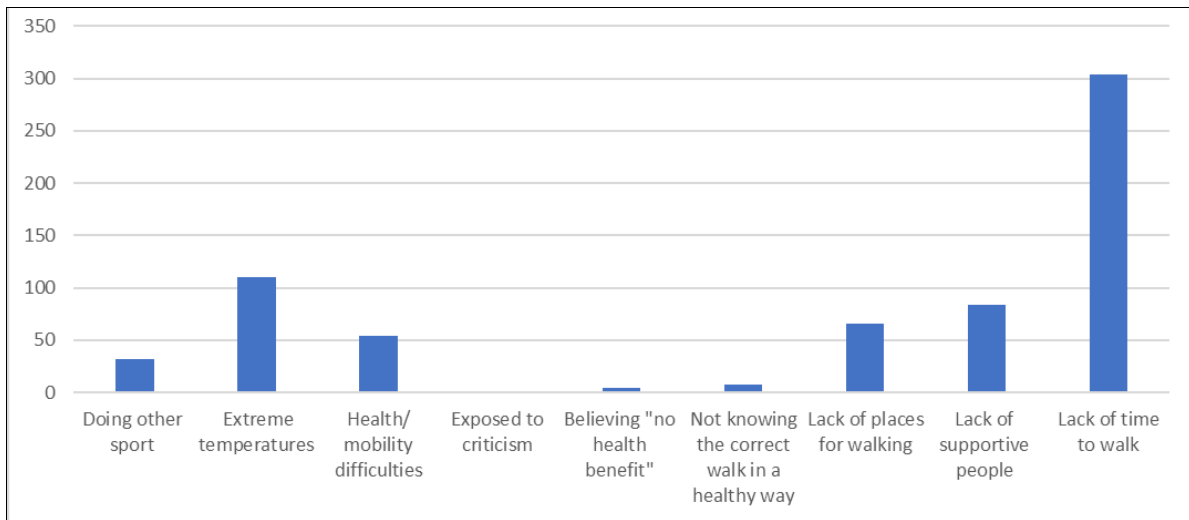


Fig 1: Perceived barriers to walking by the Participants

Results

This study included 1300 participants living in Saudi Arabia. The sociodemographic characteristics of the participants are presented in Table 1. Most participants were: Saudi (88%), participants aged between 18 and 30 (49%), males (55%), participants with university level (54%), and participants from the Saudi west area (50%). Also, most participants: employed (58%), nonsmokers (85%), disease-free status (76%), and the most BMI group reported was the overweight category (34%). Corresponding categorical data results are shown in Table 1.

A minimum of 30 min of walking (at least one day over a previous week) was reported by 727 (56%) of the participants (57% of male respondents and 43% of female respondents). Only 211 of those actively walking, reported walking for 5 days over a previous week. This represents around 16.2% of the study's total population. Around 32% (416) of the sample were sub-optimally active (as they walked less than 30 min, at least one day in a previous week). Only 12% (157) of the participants in this study were inactive (as no walking was reported), 73 (47%) of male respondents, and 84 (53%) of female respondents. Furthermore, in comparison to last year, 34% of all participants reported they walked less this year. Corresponding categorical data results are shown in Table 2. In terms of barriers to walking, 23.4% of participants reported a lack of enough time to walk, 8.4% of participants reported weather as a barrier, 5% of participants reported a lack of enough locations to walk, and 6.4% of participants reported a lack of supportive people to share or encourage them to walk. Corresponding data are shown in Figure 1.

Furthermore, almost 62% of the study participants believed that there was a lack of dedicated walking areas in the neighborhood. All these corresponding data results are shown in Table 3.

Additionally, family members were a key source of motivation for walking, according to 22% of the study participants, while 31% of the participants reported social media as the primary source of motivation for walking. Also, social media (51% of the participants) and website surfing (31% of the participants) were the most important sources of information on walking for health. All corresponding categorical data results are shown in Table 3. A chi-square test in logistic regression was performed to examine the relationship between walking status and other variables included in this study. Walking for 30 min or more in a prior week and a nonsmoker status had a significant relationship, $X^2(1, N = 639) = 9.3, p < 0.05$. Likewise, walking 30 min or more was significantly more reported in overweight and obese group, $X^2(1, N = 421) = 7.4, p < 0.05$. Age, Saudi regions, levels of education, Employment, and Health status, all had non-significant associations with walking status ($p > 0.05$). With regard to the information about walking, social media was by far the most popular among those who reported walking in this study ($X^2 = 19.3, p < 0.05$).

A chi-square test calculation on the inactive people's data ($n = 157$) in this study revealed that females ($X^2 = 11.8, p < 0.05$) and the age group aged 18-30 years old ($X^2 = 10.6, p < 0.05$) were significantly more likely to be inactive.

Table 1: Distribution of the study participants by Sociodemographic, BMI levels, Smoking Status and Health status

	Number	Percentage
Age groups		
18- 30 Yrs	642	49.3%
31-45 Yrs	352	27.1%
46-65Yrs	278	21.4%
>65 Yrs	28	2.2%
BMI levels		
Under Wight	96	7.4%
Normal Wight	406	31.2%
Over Wight	447	34.4%
Obese	351	27%
Gander		

Male	710	54.6%
Female	590	45.4%
Nationality		
Saudi	1140	87.7%
Non-Saudi	160	12.2%
Areas (Saudi Territories)		
Central	313	24.1%
west	653	50.3%
East	126	9.7%
South	151	11.5%
North	57	4.4%
Education levels		
Elementary	103	7.9%
High school	240	18.5%
University	705	54.2%
Post grad	252	19.4%
Employment status		
Worker	754	58%
Job seeker	522	40%
Retired	24	2%
Smoking status		
Smoker	192	14.8%
Non smoker	1108	85.2%
Health/Mortality status		
Diabetes	114	8.8%
Hypertension	96	7.4%
Asthma	72	5.5%
Heart disease	18	1.4%
Kidney disease	7	0.5%
No Mortality	993	76.4%

Table 2: Distribution of the study participants by walking status

	Number	Percentage
30 min or more walking at least 1 day in last week		
Yes	727	55.9%
No	573	44.1%
Last time walked for 30 min or more		
In recent 2 weeks	211	16.2%
3 weeks ago	62	4.8%
4 weeks ago	47	3.6%
More than a month	144	11.1%
A year ago	60	4.6%
Never	49	3.8%
Reported walk 30 min	727	55.9%
Less than 30 min walking at least 1 day in a previous week		
20min	252	19.3%
10min	119	9%
5min	45	3.3%
Never	157	12.3%
Reported walk 30 min	727	55.9%
Walking level this year comparing to last year		
More walking this year	433	33.3%
Almost the same to last year	426	32.8%
Less walking this year	441	33.9%

Table 3: Distribution of the study participants who perceived barriers to walking and source of motivation/ information about walking for health

	Number	Percentage
Perceived barriers to walking		
Doing a sport other than walking	32	2.4%
Extreme weather/temperatures	110	8.4%
Health or mobility difficulties	54	4.1%
Exposed to criticism or bullying while walking	1	0.1%
Believing that there is no health benefit of walking	4	0.3%
Not knowing the correct way to walk in a healthy way	7	0.5%
Lack of places for walking	66	5%
Lack of enough time to walk	304	23.4%

Lack of supportive people share walking	84	6.4%
No barriers perceived	638	49%
lack of access to designated walking places (in neighborhood)		
	Agreed	806(62%)
	Not agreed	494 (38%)
Important sources of motivation to walking		
	Friends	213(16.4%)
	Traditional media	18(1.4%)
	Websites browsing	95(7.3%)
	Family members	283(21.8)
	Walking groups	96(7.4%)
	Social media	406(31.2%)
	No source reported	189(14.5%)
Important source of information about walking		
	Friends	192(14.8%)
	Traditional media	50(3.8%)
	Websites browsing	399(30.7%)
	Social media	659(50.7%)

Discussion

Given previous research on the level of activity in Saudi Arabia, we originally hypothesized that a high number of people in the country are inactive. However, we observed in our sample that much of the population is involved in walking; more than half of our study participants reported actively walking for 30 min or more on at least one day in a previous week. However, only around one third of this active group of participants reported taking part in the ideal level of walking (150 min per week). The group achieving the ideal level of walking represented around 16.2% of the study's total sample. This percentage contradicts earlier research, which found that approximately 32% of the studied sample walks an adequate amount of the ideal level of walking (Eyler *et al.*, 2003) [8]. Accordingly, in Saudi Arabia, it is advised to promote the importance of active people and communities and encourage people to reach the optimal level of walking. As recommended by the WHO Global Action Plan 2018–2030, local health education programs should focus on the recommended 150 min of weekly walking.

Nevertheless, in terms of inactivity reported by our study sample, the survey revealed a smaller inactive percentage of the sample population (12%) compared to data from earlier studies, which showed that more than half of population in Saudi Arabia was inactive (Al-Zalabani *et al.*, 2015; Al-Hazzaa, 2007) [4, 1]. This discrepancy may indicate that public awareness of walking in Saudi Arabia has improved in recent years. For the purpose of utilizing this state of awareness, further research on the factors that encourage active people to participate in walking may be useful in enhancing health promotion efforts.

With regard to potential factors influencing walking, Logistic regression analysis suggested that significant factors associated with active walking include nonsmoker status and excess weight or obesity. This finding is consistent with other research suggesting that nonsmokers are more tolerant of physical activity (Moslemi *et al.*, 2011) [16]. By contrast, high body weight has been extensively reported among inactive people in previous studies, contradicting our results (Aliabad, 2022) [18]. An increase in walking, in comparison to other activities or sports, could be acceptable among overweight and obese people. The change may also be explained by an increased presence of health information about walking on social media, which may have reached this group. In any case, these results indicate that

health educators should focus on populations who walk infrequently, particularly smokers, and develop health education programs that encourage these people to engage in walking activities.

Despite the small number of inactive people in this study population, female participants and participants aged 18 to 30 years old were found more likely to be inactive with walking. This result is consistent with other research, which has showed gender differences in the prevalence of physical inactivity (Mielke, 2018) [15]. As a result, health promotion departments in Saudi Arabia should consider interventions that aim to close the gender gap in walking activity. Other factors in this study, including age, region, level of education, employment status, and unhealthy body status, were revealed to be nonsignificant as they showed $p > 0.05$. Similarly, the walking barriers identified in this study were consistent with those of prior research, which has indicated several factors that influence physical activity, typically including psychological, environmental, and social factors (Kelly *et al.*, 2019) [11]. In this study, social and environmental factors such as lack of logistical support, companionship, walking locations, and free time were shown to be associated with low walking participation, and psychological aspects such as confidence and fear of bullying were also found to be perceived barriers to walking. In previous research, determinants of walking, or physical activity in general, have included health, individual fitness, traffic, weather, cultural barriers, and levels of social support (Al-Hazzaa, 2018; Bauman, 2012) [2, 5]. Within this study's data, a lack of places for walking, extreme temperature changes, a lack of companionship, and a lack of time were found to be the major barriers to participation in walking. These barriers were divided according to gender; the perception of a need for companionship while walking, a shortage of walking places, and extreme temperatures were the barriers most cited by female participants in this study, whereas the perception of a lack of time was most cited by male respondents. Further research is necessary to determine how these barriers can be addressed for the people of Saudi Arabia. Furthermore, potential partnerships with stakeholders such as municipalities and human resources or social development departments have the prospective to support people affected by limited access to walking areas and free time.

Previous research on sources of information about walking and motivations to walk has reported television, physical

education, and social media as the main providers (Zhang *et al.*, 2015; Márcio *et al.*, 2010) ^[23, 14]. This study is relatively consistent with previous research, as social media and family were discovered to be the major source of information on walking and motivation to walk. Therefore, population-based health promotion efforts that encourage walking for health should consider social media as a solid platform for providing information and offering motivation for walking.

Conclusions

Walking is the physical activity most commonly recommended by evidence-based literature. However, walking levels have been assumed to be low in Saudi Arabia. Compared to prior research, our results show a higher proportion of walkers in the population, as more than half of the sample (56%) reported actively walking for 30 min or more on at least one day in a previous week. About 211 participants, or one third of this population, reported walking for at least 30 min on five days in a previous week. Overall, higher levels of walking corresponded with nonsmokers and overweight or obese people, while higher levels of inactivity corresponded with women and young people. Population-based interventions may be required to address barriers to walking, such as a lack of locations and free time for walking.

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Statement of Ethics

The Institutional Review Board (IRB) committee at the Ministry of Health examined and approved the full study's ethical process before it was conducted and data collected (Research Approval Number: 22-18/M). All participants gave their written informed consent after being fully informed before commencing the survey.

Conflict of Interest

The authors declare that there is no conflict of interests.

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Author Contributions

Author 1: Idea of the research, the research design, the research proposal, data collection, data analysis and interpretation, writing up the final research paper.

Author 2: Revising the research proposal, data collection, revising data analysis and interpretation, agreement on all aspects of the research and final approval of the paper.

Data Availability Statement

The datasets generated and analyzed during the current study are not publicly available due to data protection restrictions and participant confidentiality but are available from the corresponding author on reasonable request and with appropriate permission.

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