The Role of Wearable Devices in Cardiac Symptom Monitoring and Decision-Making Among the Saudi Public

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ABSTRACT

The process of screening and early detection of disease symptoms helps reduce such consequences. This study aims to examine the utilization profile of wearable devices in cardiac symptom monitoring and decision-making and their associated predictors among the Saudi Public. This is an online cross-sectional survey study that was conducted in Saudi Arabia between May and June 2025. The study population comprised adults aged 18 years or older, residing in Saudi Arabia, who utilize a wearable device or had knowledge of its functionality. Logistic regression analysis was conducted to predict significant factors influencing the total perception and trust score. A total of 808 participants were involved in this study. The most commonly used features of heart monitoring devices, 40.8% used heart rate tracking, 18.9% used blood oxygen monitoring, 13.4% used stress monitoring, and 23.6% used sleep monitoring. Around 36.1% reported regularly monitoring their heart health, primarily using wearable devices (19.7%), home devices (17.9%), or clinical visits (14.2%). Only 10.2% reported being advised by a specialist to use heart monitoring devices, yet 75.6% would recommend them to others. A total of 41.9% reported that they have received alerts of abnormal readings, and 7.9% rechecked the reading, while 5.0% visited a doctor. Moreover, many users felt a sense of control, with 11.4% always shared abnormal data with doctors. Regarding the Saudi public's awareness, 44.1% believed people are aware of the benefits, though a notable proportion remained unsure. Saudi nationals were significantly more likely to have higher perception and trust scores compared to non-Saudi (OR= 3.75, 95% CI: 1.03–13.69, p = 0.046). Students had significantly lower odds of perception and trust compared to those not working (OR = 0.33, 95% CI: 0.14–0.79, p = 0.013). Additionally, individuals with monthly income of 10,000-15,000 SAR and above 15,000 SAR had significantly lower odds of perception and trust scores compared to those earning less than 5,000 SAR (OR = 0.19, 95% CI: 0.06–0.63, p = 0.007; OR = 0.32, 95% CI: 0.11–0.96, p = 0.042, respectively. Saudi society is aware of wearable devices technologies and their health effects. This study also considered demographic factors that may affect device use. Saudis use technology, notably smart watches, and education, income, and device confidence were highlighted.

Keywords: Cardiac; Devices; Monitoring; Smart watch

INTRODUCTION

Cardiovascular disease (CVD) is among the most prevalent diseases globally. Until 2021, and according to American Heart Association (AHA) statistics, these diseases caused the death of more than 19 million people[1]. The importance of early detection of heart diseases is highlighted to improve the quality of treatment provided to patients, as these procedures help in improving the heart health of patients and decrease their associated hospitalization[2,3]. Advances in digital technology have significantly contributed to improving healthcare. For example, the integration of artificial intelligence (AI) tools with patients has reduced diagnostic delays through the alerts these tools provide regarding the patient's condition[4]. This technology has been made available to patients in several forms, the most important and easiest of which are wearable devices such as smart watches that monitor the patient's vital signs[5], ECG patches[6], or devices implanted within the patient's body[7]. Symptoms are considered one of the important things that help in evaluating the disease, as diagnosing and monitoring symptoms on an ongoing basis helps in increasing the effectiveness of the treatment used for the patient. In the case of cardiovascular diseases, there are many symptoms such as general fatigue and difficulty in breathing that are directly related to the heart's ability to perform well.

Therefore, the process of detecting symptoms early is considered one of the things that helps in increasing the efficiency of treatment, reducing hospital admissions, and reducing complications related to these conditions[8]. It is known that heart diseases increase the number of deaths in addition to reducing the quality of life of the patient due to

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its complications. From an economic standpoint, they are costly for the patient and healthcare institutions in terms of the cost of medications and devices used, in addition to the length of time the patient spends in the hospital, which increases the cost on both sides. Therefore, the process of screening and early detection of disease symptoms helps reduce such consequences, which is reflected in the patient's health and financial condition and reduces the pressure on hospitals and health centers[9].

Wearable devices are tools that use modern technologies to measure the patient's vital signs. In the case of a patient diagnosed with a heart-related disease, these devices measure heart rate, heart rhythm, blood pumping rates, blood oxygen levels, and others[10]. These devices contain sensors to recognize any changes in the patient's body. These devices include smart watches[11,12] and some electronic devices that check electrocardiograms[13-15]. One of the most important benefits offered by these devices is their ability to help the patient monitor himself through self-monitoring, which is defined as a person monitoring his behavior[16]. Furthermore, these devices also help physicians to monitor heart diseases continuously. For example, the use of ECG patches has helped increase the speed of diagnosis of individuals previously suffering from atrial fibrillation and reduce its associated complications[6]. In Saudi Arabia, until 2021, the death rate caused by cardiovascular diseases was approximately 55,000 cases[17].

In recent years, the Kingdom of Saudi Arabia has significantly transformed its health sector, introducing many digital technologies to become a priority for use in the health care sector to increase the efficiency and effectiveness of disease outcomes[18]. The culture of integrating technology with healthcare has become widespread in recent years among Saudi society groups, as awareness of its use, importance, and health benefits has become clear to many Saudi citizens[19]. Therefore, this study aims to examine the utilization profile of wearable devices in cardiac symptom monitoring and decision-making and their associated predictors among the Saudi Public.

METHODS

Study design: This is an online cross-sectional survey study that was conducted in Saudi Arabia between May and June 2025.

Study population: The study population comprised adults aged 18 years or older, residing in Saudi Arabia, who utilize a wearable device or had knowledge of its functionality. This study included both male and female subjects without any exclusion criteria related to their sociodemographic factors.

Participants recruitment: The questionnaire instrument was completed by the general public and the participants were invited through a convenience sampling strategy. Participants for the study were recruited and invited via social media channels, specifically Facebook and WhatsApp. Eligible participants from diverse demographic backgrounds are represented on social media platforms.

Questionnaire tool: The questionnaire tool for this study was developed based on extensive literature review. The questionnaire tool is comprised of 19 items. The questionnaire tool examined wearable device utilization pattern (5-items), awareness and medical guidance (4-items), response to device alerts (3-items), decision-making and dependence (5-items), and perception about wearable devices (2-items). Besides, demographic characteristics were also addressed (age, gender, nationality, residency, education level, occupation, and income).

Validity assessment

Content Validity of questionnaire items: A group of three professionals reviewed the questionnaire items after reviewing the study objectives to assess its content validity for all questionnaire parts. The assessment was first done independently, and then items with arguments were discussed in detail until having consensus. All suggested changes were applied to improve the questionnaire validity till the final format used in the current study was obtained.

Reliability for Questionnaire: The questionnaire trigger items showed a satisfactory level of reliability with KR-21 based on Cronbach's Alpha coefficient for dichotomous scale items data of 0.77. Removing any of the questionnaire items will not improve the questionnaire reliability so, all items should be kept.

Ethical approval: The Institutional Review Board of Al-Imam Muhammad Ibn Saud Islamic University granted ethical sanction for this research (Project number: 812/2025). Participants were advised that their completion of the questionnaire constitutes informed consent for participation.

Data analysis: Categorical variables such as the demographic characteristics including for example monthly income category, age group, gender, residency, and occupations were expressed as frequencies and percentages. The continuous data such as the total perception and trust score was expressed by mean and standard deviation (SD). The score was consisted of 10 items with multiple responses, the highest was 32 and lowest was 9, the median was 21. Additionally, a logistic regression analysis was conducted to predict significant factors influencing the total perception and trust score. Prior to logistic regression, the score was categorized into two groups based on the median score of 21. The logistic regression results were expressed as odds ratio and it is 95% confidence interval. All data

Table 1. Demographic characteristics of participants

Demographic characteristics of participants		N	%
Age (years)	18-29	454	56.7%
	30-39	98	12.2%
	40-49	146	18.2%
	50-59	73	9.1%
	60 and older	30	3.7%
Gender	Female	429	53.6%
	Male	372	46.4%
Nationality	Others	38	4.7%
	Saudi	763	95.3%
Residency	East	99	12.4%
	West	135	16.9%
	Middle	305	38.1%
	South	179	22.3%
	North	83	10.4%
Education level	Less than high school	24	3.0%
	High school	172	21.5%
	Bachelor	494	61.7%
	Diploma	79	9.9%
	Post graduate	32	4.0%
Occupation	Not working	119	14.9%
	Student	324	40.4%
	Working	304	38.0%
	Retired	54	6.7%
Income (SAR)	Less than 5000	399	49.8%
	5000-10000	161	20.1%
	10000-15000	103	12.9%
	15000 and above	138	17.2%

analysis was conducted utilizing SPSS software, version 29. A p-value less than 0.05 considered as significant.

RESULTS

A total of 808 participants were involved in this study. Most participants were aged between 18 and 29 years, with 454 individuals (56.7%), followed by 146 aged 40-49 (18.2%), 98 aged 30-39 (12.2%), 73 aged 50-59 (9.1%), and 30 aged 60 or older (3.7%). The majority were female with 429 participants (53.6%), while 372 were male (46.4%). Most respondents were Saudi nationals, totaling 763 (95.3%), compared to 38 non-Saudi (4.7%). Regarding region of residency, 305 participants (38.1%) were from the central region, followed by 179 participants from the south (22.3%). Education levels showed that 494 participants (61.7%) held a bachelor's degree, 172 (21.5%) completed high school, 79 (9.9%) had a diploma. In terms of occupation, 324 (40.4%) were students, 304 (38.0%) were employed. Income distribution revealed that 399 participants (49.8%) earned less than 5000 Saudi Arabia riyal (SAR) monthly, 161 (20.1%) earned between 5,000-10,000 SAR monthly, Table 1.

Among the participants, several reported having comorbidities: 55 (6.8%) had diabetes, 25 (3.1%) had cardiovascular disease, 60 (7.4%) had hypertension. Regarding heart related symptoms, 155 (19.4%) reported fatigue, 111 (13.9%) experienced dizziness or fainting, 173 (21.6%) had shortness of breath. For the most commonly used features of heart monitoring devices, 327 participants (40.8%) used heart rate tracking, 151 (18.9%) used blood oxygen monitoring, 107 (13.4%) used stress monitoring, 189 (23.6%) used sleep monitoring, Table 2.

Table 2. Prevalence of comorbidities, cardiac symptoms, and utilizing of heart monitoring features among participant.

Variables			N	%
Comorbidities	None		572	71.4%
	Diabetes		55	6.8%
	Cardiovascular		25	3.1%
	Hypertension		60	7.4%
	Obesity		70	8.7%
	Others		86	10.7%
Do you have heart symptoms	Fatigue	No	646	80.6%
		Yes	155	19.4%
	Dizziness/Fainting	No	690	86.1%
		Yes	111	13.9%
	Shortness of breath	No	628	78.4%
		Yes	173	21.6%
	Chest pain	No	611	76.3%
		Yes	190	23.7%
	Palpitations	No	529	66.0%
		Yes	272	34.0%
	None of the above	No	478	59.7%
		Yes	323	40.3%
Most commonly used features	Heart rate	No	474	59.2%
		Yes	327	40.8%
	Blood oxygen level	No	650	81.1%
		Yes	151	18.9%
	Stress monitoring	No	694	86.6%
		Yes	107	13.4%
	Sleep monitoring	No	612	76.4%
		Yes	189	23.6%
	ECG	No	727	90.8%
		Yes	74	9.2%
	Activity tracking	No	502	62.7%
		Yes	299	37.3%

Table 3. Heart health monitoring practices and wearable devices among participants.

Items		N	%
Do you regularly monitor your heart health	No	512	63.90%
	Yes	289	36.10%
If yes, how?	None	386	48.20%
	Wearable device	158	19.70%
	Home device for measuring blood pressure/pulse	143	17.90%
	Regular clinic visits	114	14.20%
Do you have a wearable device? If yes, what type of device?	Apple Watch	272	34.00%
	Huawei	71	8.90%
	Samsung Galaxy Watch	23	2.90%
	Whoop	19	2.40%
	Others	37	4.60%
	No	379	47.30%
How long have you been using the device?	Less than 6 months	82	19.40%
	6 months - 1 year	93	22.00%
	1-3 years	112	26.50%
	3 years and more	135	32.00%
How often do you check your heart data?	None	379	47.30%
	Rarely	99	12.40%
	Several times a week	91	11.40%
	Sometimes	151	18.90%
	Daily	81	10.10%

Out of the participants, 289 (36.1%) reported regularly monitoring their heart health, primarily using wearable devices (158, 19.7%), home devices (143, 17.9%), or clinical visits (114, 14.2%). The most commonly used wearable was Apple watch (272, 34.0%), followed by Huawei (71, 8.9%). Among wearable users, 135 (32.0) had been using the device for over 3 years, Table 3.

Only 43 participants (10.2%) reported being advised by a specialist to use heart monitoring devices, yet 319 (75.6%) would recommend them to others. While trust in the device reading varied, with 162 (20.2%) trusting them to a large extent, only 30 (3.7%) fully trusted them. A total of 177 (41.9%) received alerts of abnormal readings, and 63 (7.9%) rechecked the reading, while 40 (5.0%) visited a doctor. Many users felt a sense of control, with 163 (11.4%) always shared abnormal data with doctors. Regarding the Saudi public's awareness, 186 (44.1%) believed people are aware of the benefits, though a notable proportion remained unsure, Table 4.

Factors associated with perception and trust in heart monitoring devices

The total perception and trust score was (21.1 ± 4.1). The logistic regression analysis revealed that several factors were significantly associated with higher perception and trust in heart monitoring devices. Saudi nationals were significantly more likely to have higher perception and trust scores compared to non-Saudi (OR= 3.75, 95% CI: 1.03–13.69, p = 0.046). Students had significantly lower odds of perception and trust compared to those not working (OR = 0.33, 95% CI: 0.14–0.79, p = 0.013). Additionally, individuals with monthly income of 10,000-15,000 SAR and above 15,000 SAR had significantly lower odds of perception and trust scores compared to those earning less than 5,000 SAR (OR = 0.19, 95% CI: 0.06–0.63, p = 0.007; OR = 0.32, 95% CI: 0.11–0.96, *p* = 0.042, respectively), Table 5.

Table 4. Perception, trust and behavioral responses to heart monitoring devices

Items		N	%
Has a specialist advised you to use a heart monitoring device?	No	379	89.8%
	Yes	43	10.2%
Do you believe the devices give accurate readings?*	Strongly disagree	11	2.6%
	disagree	44	10.4%
	Neutral	170	40.3%
	Agree	172	40.8%
	Strongly agree	25	5.9%
Your awareness of the limitations of these devices *	No	29	6.9%
	Yes	220	52.1%
	Not sure	173	41.0%
Do you trust the readings? *	None using	379	47.3%
	To a large extent	162	20.2%
	To some extent	212	26.5%
	Completely	30	3.7%
	Not at all	18	2.2%
Has the device ever alerted you to an abnormal reading? *	No	245	58.1%
	Yes	177	41.9%
If yes, what did you do?		556	69.4%
	Called emergency	7	0.9%
	Searched online	45	5.6%
	Ignored the alert	77	9.6%
	Contacted someone	13	1.6%
	Checked the reading again	63	7.9%
	Visited a doctor	40	5.0%
Were the alerts consistent with your symptoms? *	Never	41	14.7%
	Rarely	39	14.0%
	Sometimes	150	54.0%
	Always	48	17.3%
Do you seek medical advice solely based on the device alert?	None using	379	47.3%
	Depending on the severity	221	27.6%
	No	146	18.2%
	Yes	55	6.9%
Do you feel more in control of your health because of the device? *	Strongly disagree	23	5.5%
	Disagree	49	11.6%
	Neutral	146	34.6%
	Agree	163	38.6%
	Strongly agree	41	9.7%
How much do you rely on the device for health decisions?		379	47.3%
	Not at all	82	10.2%
	Somewhat rely	148	18.5%
	Strongly rely	47	5.9%
	Slightly rely	145	18.1%
Do you share your heart data with a doctor if there's an abnormal reading? *	Never	194	46.0%
	Rarely	92	21.8%
	Sometimes	88	20.9%
	Always	48	11.4%
Do you think the device reduces the need for routine checkups? *	Strongly disagree	81	19.2%
	Disagree	99	23.5%
	Neutral	122	28.9%
	Agree	98	23.2%
	Strongly agree	22	5.2%
Would you recommend others to use such devices? *	No	23	5.5%
	Yes	319	75.6%
	Not sure	80	19.0%
Do you think the Saudi public is aware of their benefits? *	No	96	22.7%
	Yes	186	44.1%
	Not sure	140	33.2%

* The scored' items.

Table 5. Logistic regression analysis of factors associated with perception and trust in heart monitoring devices

Variables		OR (95% CI)	P value
Age	18-29	Reference	
	30-39	0.93 (0.36–2.39)	0.876
	40-49	0.82 (0.32–2.10)	0.683
	50-59	0.96 (0.22–4.13)	0.957
	60-	0.18 (0.01–2.43)	0.196
Gender	Female	Reference	
	Male	1.20 (0.66–2.18)	0.551
Nationality	Non-Saudi	Reference	
	Saudi	3.75 (1.03–13.69)	0.046
Residency	East	Reference	
	West	0.47 (0.16–1.35)	0.158
	Middle	0.48 (0.19–1.19)	0.113
	South	0.54 (0.19–1.50)	0.234
	North	1.16 (0.35–3.82)	0.804
Education level	Less than high	Reference	
	High school	1.42 (0.22–8.94)	0.711
	Bachelor	0.85 (0.14–5.15)	0.858
	Diploma	0.48 (0.07–3.49)	0.472
	Post grad	2.02 (0.23–17.87)	0.526
Occupation	Not working	Reference	
	Student	0.33 (0.14–0.79)	0.013
	Working	2.16 (0.73–6.45)	0.166
	Retired	3.43 (0.39–30.44)	0.269
Income	Less than 5000	Reference	
	5000-10000	0.69 (0.28–1.68)	0.414
	10000-15000	0.19 (0.06–0.63)	0.007
	15000-	0.32 (0.11–0.96)	0.042
	Constant	0.95 (0.00–0.00)	0.965

DISCUSSION

The current study came to assess how wearable devices influence cardiac symptom monitoring and healthcare decision-making among the Saudi population, evaluate the level of public trust in wearable health alerts, identify the actions taken by users upon receiving cardiac-related alerts, assess public knowledge and interpretation of cardiac data (e.g., heart rate, ECG) generated by wearable devices, explore barriers to action, including cost, fear, misinterpretation, or false reassurance, and identify predictors of using wearable devices in cardiac symptom monitoring.

In this study, the most commonly used features of heart monitoring devices, 40.8% used heart rate tracking, 18.9% used blood oxygen monitoring, 13.4% used stress monitoring, and 23.6% used sleep monitoring. One of the most important measurements for cardiovascular patients is the heart rate, thus many technologies have been developed to measure it in convenient way by the heart patients, these tools used to facilitate the process of knowing the heart rate. Among these devices used are smart watches that are produced by large international companies[20]. Because heart patients, especially those at risk of heart failure, measuring the percentage of oxygen saturation in their bodies is important to assess the level of symptoms associated with this condition. Heart failure is linked to a lack of oxygen, which worsen the patient heart health and sometimes lead to death[21]. Consequently, Apple company has created a smart watch that has the ability to measure the level of oxygen in the body for 24 hours[22].

Another important thing that must be measured in heart patients is stress and sleep, as stress directly affects the quality of sleep. Many studies have shown that some programs must be developed to measure the level of stress in these patients, and thus this is reflected in the quality of their sleep, because this directly affects the performance and function of the heart[23]. In an experiment on heart failure patients to evaluate the usefulness of wearable devices and their role in identifying and determining heart rate and oxygen level, this study reported that these devices helped these patients to identify disorders related to heart rhythms and also helped to identify a decrease in oxygen level through some alerts that these devices given to patients[24]. In another study that also focused on the use of smart watches and their role in cardiovascular patients, this study confirmed that these watches helped patients to calculate and know the level of heart function, and through some applications on these watches, they had the ability to know the sleep pattern and know the amount of stress that the patient is exposed to through the heartbeats. Therefore, these watches were important to provide a general picture about the health of this patient, and thus this is reflected in the treatment provided to him later to reduce the complications that can occur because these patients are more susceptible than others to the deterioration of the condition[25].

Our study revealed that 36.1% reported regularly monitoring their heart health, primarily using wearable devices (19.7%), home devices (17.9%), or clinical visits (14.2%). Perhaps the most important thing that a patients look for during the treatment journey is that the treatment be comfortable and easy for them. As for the devices that can be worn on the hands, many studies have shown that they are comfortable and do not require implantation as in traditional methods. They are also easy to adjust for patients of different cultures and levels and are available at prices suitable for everyone. Therefore, many patients resort to them because traditional methods are annoying for them[26-33]. There is also another type of device that can be used by patients, which are devices intended for use at home, as they sometimes help patients to perform some tasks, especially for the elderly who face many problems in continuous and repeated visits to clinics or hospitals. However, although these devices facilitate some things for patients, some patients suffer, as previous studies have shown that most patients are not completely satisfied with these tools. Studies also emphasize the importance of making some modifications to them in order for them to suit the patient himself and also suit his family to deliver the best medical care to them[34]. As for seeing a doctor in a hospital, health center, or health organization, there are many patients who suffer from time, whether this time is the time taken to get to the clinic, as many people live far from clinics or health centers, and the other matter is the time taken to wait and enter the doctor[35]. In addition, the patient's visit to the clinic is directly linked to increased costs for him, which limits patients' visits to doctors on a continuous and regular basis[36].

In this study, the most commonly used wearable was Apple watch (272, 34.0%), followed by Huawei (71, 8.9%). Among wearable users, 135 (32.0) had been using the device for over 3 years. Based on the percentage of smart watch sales around the world, the best-selling watches, according to a study, were Apple, then Samsung, then Huawei[37]. Mueller-Leisse et al. in 2021 studied the effectiveness of defibrillators device. The participants in this study wore these devices from 2012 to 2017, i.e. for a period of 6 years[38]. In another study to evaluate the work of wearable devices, participants in this study wore these devices for six months during which these cases were followed up[39].

In this study, only 10.2% reported being advised by a specialist to use heart monitoring devices, yet 75.6% would recommend them to others. Many studies have shown that most cardiologists use adjustable wearable devices to help them diagnose heart disease, but the lack of guidelines related to these devices can be a problem for them[40,41]. As for

patient satisfaction with these devices and their use, many studies have confirmed that patients feel comfortable using these devices because they save them a lot of things. They are easy to wear and easy to deal with, in addition to their prices being acceptable among people[42].

Moreover, in this study while trust in the device reading varied, with 20.2% trusting them to a large extent, only 3.7% fully trusted them. There are many patients, especially the elderly, who do not like to use wearable devices because of the idea they have that these tools can give them incorrect results regarding their health condition, and thus this is reflected in their opinions about these tools[43,44]. On the other hand, some cardiovascular patients had positive opinions about these tools and their use, as they significantly improved their commitment and physical activity[45].

In this study, a total of 41.9% reported that they have received alerts of abnormal readings, and 7.9% rechecked the reading, while 5.0% visited a doctor. Moreover, many users felt a sense of control, with 11.4% always shared abnormal data with doctors. This result was consistent with what was found in a study that some patients suffering from atrial fibrillation had used potentially wearable devices. It was found that many patients had shared some readings with their doctors about their abnormal heart rhythm[46]. On the other hand, most people prefer to visit a doctor rather than using modern technology in their treatment, due to the beliefs and ideas they have about visiting a doctor, that it is better than these tools in terms of knowing the accurate diagnosis of the case and seeing the doctor in order to understand the patient's health condition better than taking it through modern technology tools[47]. Regarding the Saudi public's awareness, 44.1% believed people are aware of the benefits, though a notable proportion remained unsure. In the Kingdom of Saudi Arabia, the use of these devices has been widespread among people, especially smart watches. It has been observed that heart disease patients, especially who are with irregular heartbeats, has helped them detect their condition early and has been positive for them[48].

In this study, Saudi nationals were significantly more likely to have higher perception and trust scores compared to non-Saudi (OR= 3.75, 95% CI: 1.03–13.69, p = 0.046). There are general studies in the Kingdom of Saudi Arabia on the benefits of wearable devices. Many Saudis use smart watches in their daily lives to monitor their vital signs and estimate the physical movement that help them in indicating their body health[49]. Students had significantly lower odds of perception and trust compared to those not working (OR = 0.33, 95% CI: 0.14–0.79, p = 0.013). In a study conducted on a number of patients suffering from atrial fibrillation, the relationship between educational level and its role and impact on the use of wearable devices, unlike our study, this study confirmed that there is no relationship between educational level and the use of these devices[50]. Additionally, individuals with monthly income of 10,000-15,000 SAR and above 15,000 SAR had significantly lower odds of perception and trust scores compared to those earning less than 5,000 SAR (OR = 0.19, 95% CI: 0.06–0.63, p = 0.007; OR = 0.32, 95% CI: 0.11–0.96, p = 0.042, respectively. This result from our study is inconsistent with a study on American citizens, where it was observed that citizens with higher income tend to purchase wearable devices more than those with lower incomes[51].

Recommendations of healthcare professionals and practice:

It is important for healthcare providers to provide patients with sufficient knowledge about wearable devices that can be used to correctly to identify and measure vital signs. The patient must also know the aim of this device for diagnostic purposes and early recognition of any symptoms that are associated with and increase the patient's risk of heart disease. Healthcare providers should also educate the patient on how to wear these devices correctly and understand the data accurately so that no errors occur in understanding the data[52]. It is also important for the patient when using these devices to use certified devices, i.e. those approved by the Food and Drug Administration (FDA) to use for medical purposes, in order to avoid the patient using any devices that could give incorrect readings or a wrong diagnosis depending on the patient's condition[53].

The patient must understand that these devices help change his lifestyle for the better through the alerts that these devices give regarding adherence to medication, heart rate, and regularity, in order to detect any problems that a patient may face[54]. In addition, they help raise the level of physical activity in a patient. Many patients face a lot of stress when using these devices, and they become highly anxious about what result or reading these devices can produce. Therefore, the balanced use of these devices must be explained to the patient so that they are not monitored excessively and all the time, and so that any warning that the device may give to the patient is not neglected[55].

It is also important to have continuous communication between the patient and the doctor about the efficiency and effectiveness of these devices and what readings they give the patient at home and whether these readings differ from the readings in the clinic and whether they are consistent with the patient's condition and the patient's health records that are with the doctor to provide the best health care to the patient[56].

CONCLUSION

This study came to know and evaluate the role of devices that can be wear by patients, especially in measuring the symptoms of heart disease among members of the Saudi society. This study showed what are the most used devices by Saudis and what are the companies that they rely on more than others in purchasing these devices. It was shown that this group prefers to use smart watches from Apple and Huawei companies. This study also came to know what are the methods that patients prefer to know about their diseases and this included three options: the use of wearable devices, home devices, or preferring visits to the clinic. This study also revealed that the level of confidence in these devices varies among people. In addition, some people have shown that these devices have helped them to know abnormal indicators of their vital signs. It was noted that the Saudi society has awareness and knowledge of the use of these devices and their impact on health. This study also addressed the demographic changes that can affect the use of these devices. It was noted that Saudis tend to use devices, especially smart watches, in addition to the relationship between education and individual income and the level of confidence in these devices.

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