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ORIGINAL ARTICLE

Public awareness of the medical ID feature on smartphones in Jeddah in 2020

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ABSTRACT

Background: Medical identification (ID) feature on smartphones provides healthcare providers (HCPs) with crucial information about the patient in emergencies. Utilizing medical IDs depends on public awareness.

Objective: To estimate the level of awareness about medical ID features on smartphones among the public in Jeddah, Saudi Arabia, in 2020. The estimated awareness will be compared to similar studies in Saudi Arabia.

Methods: This was a qualitative cross-sectional study. A standardized electronic questionnaire was distributed to the public of Jeddah. Responses of the participants were collected via a Google Form. The data were analyzed in Statistical Package for the Social Sciences V27 to answer the questions of interest.

Results: In total, 388 participants met the inclusion criteria. Of the respondents, 36.3% were aware of medical ID features on smartphones, with more awareness among females and significant associations of awareness with age and education level ($p = 0.004$, $p = 0.026$). Additionally, the medical ID feature on smartphones was the most recognized and used type of medical ID (74.6% and 70.37%, respectively) by those aware of medical ID.

Conclusion: Awareness of the medical ID feature on smartphones among the participants was low. The study findings add to the nationwide data on this issue and provide an objective measurement of medical ID awareness which can guide future efforts concerning educating the public and HCPs about this feature's importance and ease of use.

Keywords: Emergencies, resuscitation orders, medical history taking, health records, technology, anaphylaxis.

Background

A patient's medical background plays a vital role in the assessment and management. Traditionally, this is acquired through history taking involving the patients, their companions, emergency medical personnel, or accessing the patient's medical record. However, in emergencies, there is a chance that the patient will present at a hospital at which does not have a medical record because they have not previously visited that institution. In the mid of 20th century, medical identification (ID) tools were described in the literature. Since then, many forms of medical ID have been sold. Medical IDs can be worn as jewelry, such as bracelets and other accessories, or carried in different forms, such as wallet cards, tattoos, or, most recently, medical ID features or applications (apps) on smartphones [1,2]. The medical ID feature on smartphones can be accessed without using a passcode to unlock the phone, which is essential when the patient is unconscious. The medical ID provides healthcare providers (HCPs) with the necessary information that might impact patient outcomes in emergencies and can be especially useful if the patient cannot communicate. It includes information about personal identity such as name, blood type, contact number of next of kin, anaphylactic allergies, current therapeutic drugs, organ-donation status, implanted medical devices, or non-evident rare medical conditions. There are many substantial benefits of having a medical ID that can save lives [1,3-5]. The American College of Emergency Physicians has endorsed the use of various medical IDs

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by patients due to the invaluable information provided to acute-care providers [6].

Additionally, the development of medical ID features on mobile phones, the revolution in smartphones, and the occurrence of tragic terrorism events over the years have led to increased medical ID use. However, the growth is less than desired, possibly due to a lack of advertising associated with the minimal profit gained from these applications by the manufacturing companies [3]. Moreover, it is worth mentioning that medical IDs in various forms are not regulated by law. Hence, the information provided in them might be questioned by the HCP. For example, if a person decides to include personal health information in their medical ID, they are not obliged to provide proof of accuracy from a physician [1]. Furthermore, the patient who presents in cardiac arrest with a bracelet or a necklace mentioning the directive "Do Not Resuscitate" would lead to a substantial ethical dilemma for the HCP. In fact, medical IDs, such as tattoos, are not legally binding for HCPs, and resuscitative efforts would be initiated, postponing the decision to stop supportive care until the validity of the advanced directive could be ascertained [5,7].

The medical ID feature on smartphones is free of charge and easy to access and use. It can be accessed without the need for a passcode, and it shows the name, date of birth, medical condition, blood type, and emergency contacts of the individual (Figures 1 and 2). Appreciating the importance of using medical IDs by the public would benefit both HCPs and patients.

Due to the valuable role and potential benefit of the medical ID feature on smartphones, this study was conducted to estimate the awareness of this feature among the public in Jeddah, Saudi Arabia.

Materials and Methods

This study was a qualitative cross-sectional study. It was conducted between May and December 2020 in Jeddah, Makkah Region, Saudi Arabia. The population in Jeddah is estimated to be approximately 3 million. RAOSOFT, the sample size calculator, was used to calculate the needed sample size and was determined to be 385, assuming a 95% confidence level, 5% sampling error, and 50% probability of prevalence. The sampling technique was nonprobability convenience sampling.

A questionnaire was formulated to analyze public awareness of the medical ID feature on smartphones. First, the validity and reliability of the questionnaire were checked by performing a pilot study with 10 subjects. The survey was initially created in English, then was translated into Arabic by an author who is a native Arabic speaker, and then translated back into English to assure linguistic validity. The pilot study was analyzed in the statistical program Jhon's Macintosh Project. Then revision of the questionnaire in both Arabic and English was performed and standardized for use by expert researchers and an epidemiologist in the Ministry of National Guard, Health Affairs. The Institutional Review Board of King Abdullah International Medical Research Center approved the research proposal and both the Arabic and English forms of the questionnaire.

The questionnaire was distributed to the public in Arabic via a Google form link in addition to random social media distribution. The inclusion criteria were people from Jeddah, consent to participate, age between 18 and 50 years, and owned and used smartphones. Those who did not meet the inclusion criteria were excluded from the study. The questionnaire contained seven questions: demographic data, awareness of medical IDs, previous

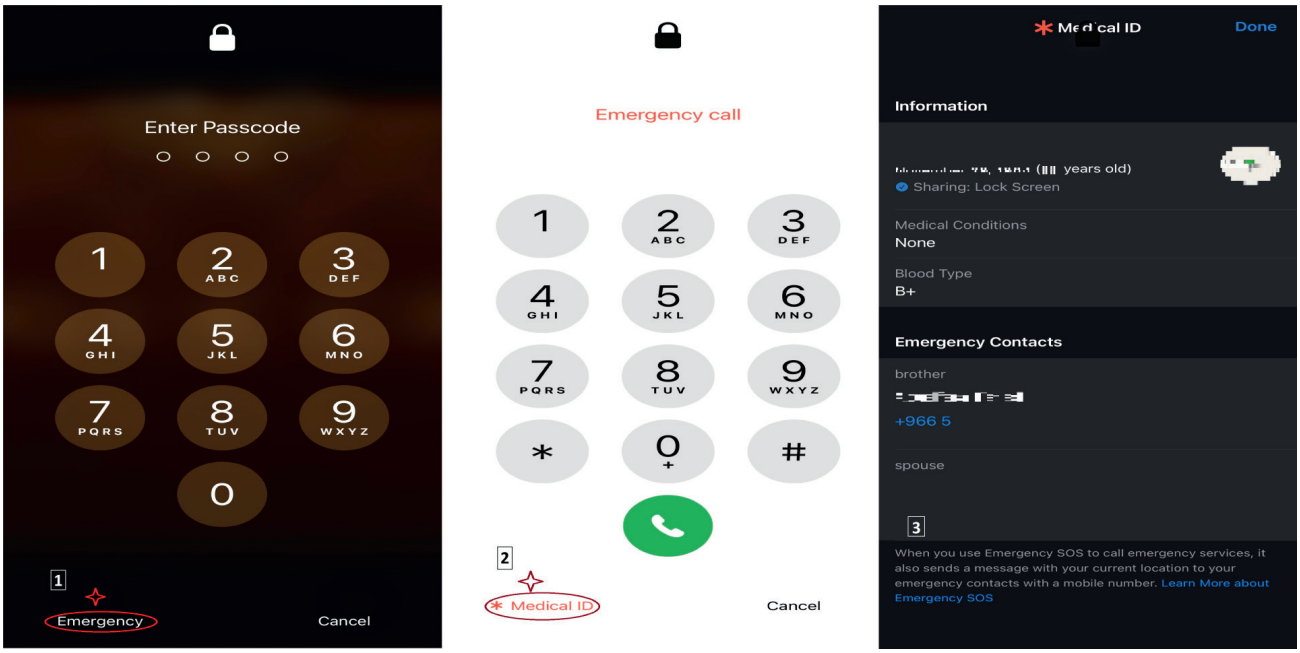

Figure 1. *A locked screen on an Apple iPhone. Accessing the medical ID on this device, from left to right, (step 1) choose emergency in the lower-left corner, (step 2) on the emergency screen choose medical ID in the lower-left corner, then (step 3) on the medical ID screen, you can access information including name, age, date of birth, medical conditions, blood type, and emergency contacts.*

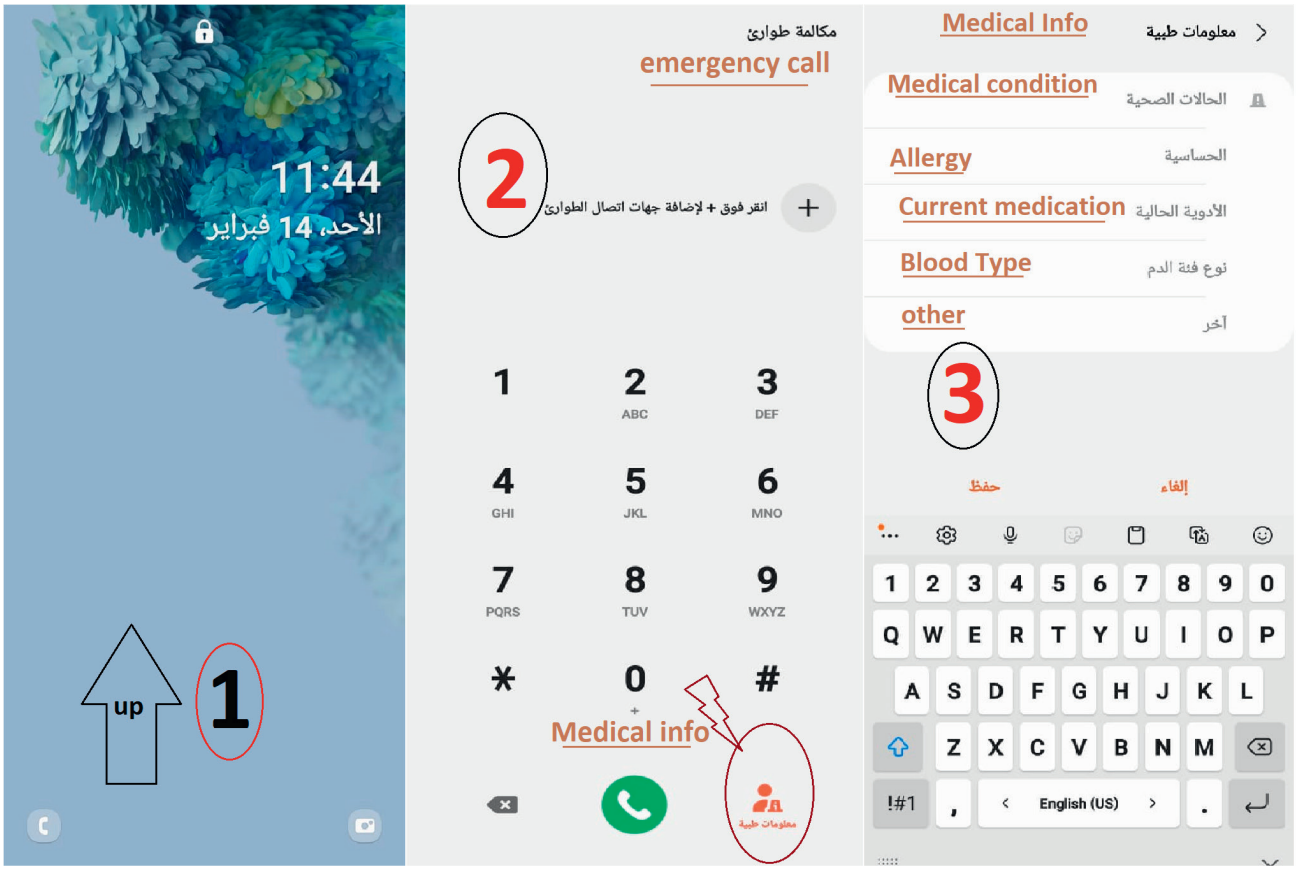

Figure 2. *A locked screen on an Android phone. To access the medical ID feature on this device, from left to right, (step 1) swipe up, choose emergency call, then (step 2) choose medical info in the right lower corner, then (step 3) on the medical info screen, you can access information including medical conditions, allergies, blood type, and other info.*

use of medical IDs, type of medical ID used, opinion regarding whether having a medical ID feature on smartphones would benefit HCPs, and participants' intent of using this feature in the future. The demographic data in question were sex, age, level of education, type of smartphone, and the presence of any chronic medical condition.

The collected data were entered into Statistical Package for the Social Sciences V 27.0.1.0 for statistical analysis. The Chi-square test was used to analyze the relationships between different categorical variables. A *p*-value less than (<0.05) was considered to be statistically significant.

Results

Demographic characteristics

Four hundred ninety-one participants completed the questionnaire; 103 respondents were excluded because they were above 50 years. Three hundred eighty-eight participants met the inclusion criteria. A total of 162 (41.8%) were males, and 226 (58.2%) were females. The majority were between 20 and 30 years old (50.5%). In addition, most of the participants had finished university (79.6%), the most frequently reported type of smartphone owned was an iPhone (84.3%), and the majority didn't have a chronic disease (71%). The demographic characteristics are shown in Table 1.

Table 1. *Demographic characteristics of the study participants (n = 388).*

Demographic characteristics		Frequency *n* (%)
Sex	Male	162 (41.8%)
	Female	226 (58.2%)
Age	18-20	66 (17%)
	20-30	196 (50.5%)
	30-40	55 (14.2%)
	40-50	71 (18.3%)
Education	School	42 (10.8%)
	University	309 (79.6%)
	Higher education	37 (9.5%)
Type of smartphone	IOS (iPhone)	327 (84.3%)
	Android (Samsung or Huawei)	57 (14.7%)
	Other	4 (1%)
Chronic disease	Yes	111 (28.6%)
	No	277 (71.4%)
Type of chronic disease	Diabetes	15 (3.9%)
	Hypertension	11 (2.8%)
	Cancer	0
	Allergy	18 (4.6%)
	Bronchial asthma	11 (2.8%)
	Other diseases	71 (18.3%)

Q.1. Awareness of medical IDs

One hundred eighty-nine of the participants (48.71%) were aware of and used the medical ID (Figure 3).

Of those who reported that they were aware of medical ID, more were female than male (67.7% *vs.* 32.3%, *p-value* ≤ 0.001). The type of smartphone owned was significantly associated with awareness ($p = 0.027$), where IOS owners had more awareness about medical ID than Android owners (88% *vs.* 10%). The age of the participants, level of education, presence of chronic disease, and use of medication for a chronic condition did not have significant associations with the level of awareness.

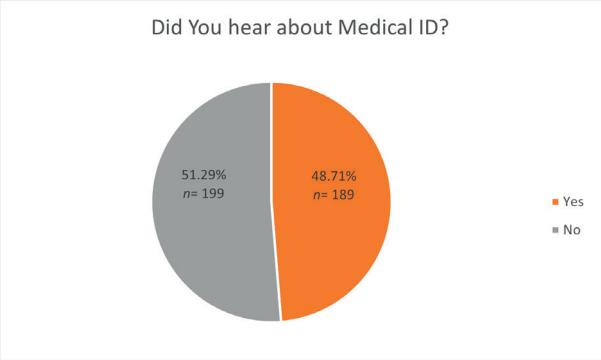

Figure 3. *The awareness of medical IDs of the participants by percentage.*

Q.2. Type of medical IDs they heard about

Type of smartphone, having a chronic medical condition, and medication for chronic disease were not significantly associated with the type of medical ID they were aware of. Females were more aware of medical ID features on smartphones than males (46% *vs.* 28%, $p \leq 0.001$). Those aged 20-30 years (40%) were more aware of medical ID features on smartphones than other age groups (*Age:* $p = 0.004$). Education level was significantly related to the type of medical ID they heard about ($p = 0.026$) (Table 2). The most commonly recognized type of medical ID was the medical ID feature on smartphones (36.3%) (Figure 4).

Q.3. Type of medical ID used

One hundred thirty-three of the participants had used the medical ID feature on smartphones, followed by medical ID apps, other types of medical ID, and medical ID jewelry or cards. The level of education, type of smartphone owned, and using medications for a chronic condition did not have significant associations with the type of medical ID used. However, sex, age, and having

Table 2. *Type of medical ID the participants heard about.*

Variables		Type of medical ID heard about? (*n* = 388)					*p*-value
		Medical ID feature on smartphones *n* (%)	Medical ID jewelry or card *n* (%)	Medical ID apps *n* (%)	Other types *n* (%)	None *n* (%)	
Sex	Male	53 (32.7%)	2 (1.2%)	5 (3.1%)	1 (0.6%)	101 (62%)	<0.001*
	Female	88 (38.9%)	10 (4.4%)	23 (10.2%)	7 (3.1%)	98 (43.4%)	
	Total = 388	141 (36.3%)	12 (3.1%)	28 (7.2%)	8 (2.1%)	199 (51.3%)	
Age	18-20	25 (37.9%)	4 (6.1%)	4 (6.4%)	4 (6.1%)	29 (43.9%)	0.004*
	20-30	76 (38.8%)	4 (2%)	5 (2.6%)	3 (1.5%)	108 (55.1%)	
	30-40	19 (34.5%)	2 (3.6%)	8 (14.5%)	1 (1.8%)	25 (45.5%)	
	40-50	21 (29.6%)	2 (2.8%)	11 (15.5%)	0	37 (52.1%)	
	Total = 388	141 (36.3%)	12 (3.1%)	28 (7.2%)	8 (2.1%)	199 (51.3%)	
Level of education	School	16 (38.1%)	1 (2.4%)	1 (2.4%)	4 (9.5%)	20 (47.6%)	0.026*
	University	110 (35.6%)	10 (3.2%)	22 (7.1%)	4 (1.3%)	163 (52.8%)	
	Higher education	15 (40.5%)	1 (2.7%)	5 (13.5%)	0	16 (43.2%)	
	Total = 388	141 (36.3%)	12 (3.1%)	28 (7.2%)	8 (2.1%)	199 (51.3%)	
Type of smartphone	IOS (iPhone)	125 (38.2%)	9 (2.8%)	25 (7.6%)	8 (2.4%)	160 (48.9%)	0.17
	Android (Samsung or Huawei)	13 (22.8%)	3 (5.3%)	3 (5.3%)	0	38 (66.7%)	
	Other	3 (75%)	0	0	0	1 (25%)	
	Total = 388	141 (36.3%)	12 (3.1%)	28 (7.2%)	8 (2.1%)	199 (51.3%)	
Chronic disease	Yes	37 (33.3%)	3 (2.7%)	10 (9%)	2 (1.8%)	59 (53.2%)	0.85
	No	104 (37.5%)	9 (3.2%)	18 (6.5%)	6 (2.2%)	140 (50.5%)	
	Total = 388	141 (36.3%)	12 (3.1%)	28 (7.2%)	8 (2.1%)	199 (51.3%)	
Chronic medication	Yes	20 (33.9%)	1 (1.7%)	4 (6.8%)	1 (1.7%)	33 (55.9%)	0.92
	No	121 (36.8%)	11 (3.3%)	24 (7.3%)	7 (2.1%)	166 (50.5%)	
	Total = 388	141 (36.3%)	12 (3.1%)	28 (7.2%)	8 (2.1%)	199 (51.3%)	

(*) significant *p*-value <0.05.

a chronic disease were significantly associated with the type of medical ID used ($p \leq 0.001$, $p \leq 0.001$, $p \leq 0.001$, respectively) (Table 3). The medical ID feature on smartphones was the most frequently used (70.3%) among participants (Figure 5).

Q.4. Is the medical ID feature on smartphones beneficial to HCPs?

When the participants were asked if they thought that the medical ID feature on smartphones would benefit HCPs, most of them answered, "Yes" (n = 364, 94.5%). In addition, sex was significantly associated with the participants' opinion (p = 0.011), while age, level of education, type of smartphone owned, chronic disease, and use of a medication for a chronic condition were not.

Q.5. Willingness to use the medical ID feature on smartphones in the future

The participants were asked about their willingness to use the medical ID feature on smartphones in the future, and the majority answered: "Yes" (n = 363, 93.5%). This response was significantly associated with sex and the type of smartphone owned (p = 0.002, p = 0.038, respectively); however, none of the other parameters were significantly associated.

Discussion

The study results showed that (36.3% of the total) were aware of the medical ID feature on smartphones and represent 74.6% of those aware of the medical ID concept, and (34.27% of total, 70.3% of the aware group)

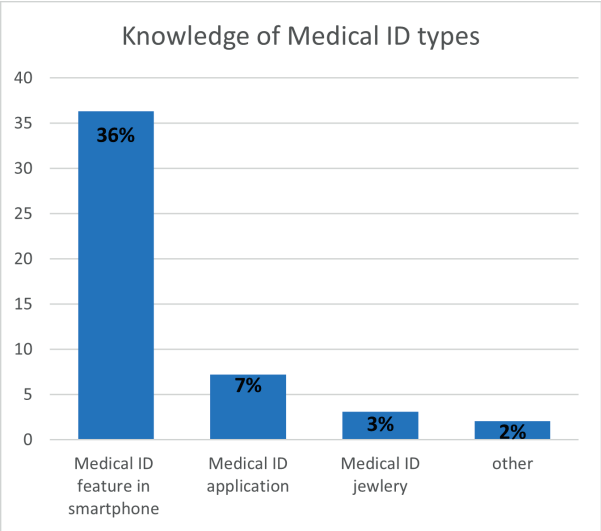

Figure 4. *The percentages of participants who were aware of various types of medical ID.*

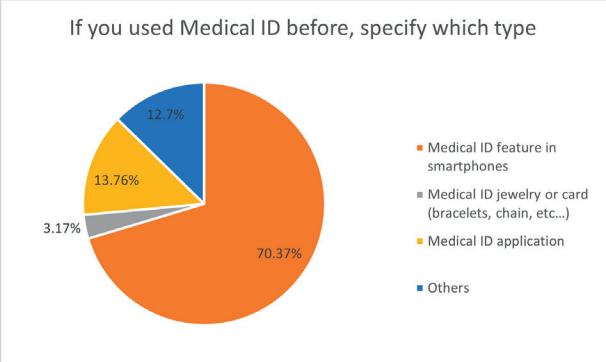

Figure 5. *The type of medical ID used by the aware group of the study participants.*

Table 3. *Type of medical ID the participants used.*

Variables		Type of medical ID used before? (n = 388)					p-value
		Medical ID feature on smartphones n (%)	Medical ID jewelry or card n (%)	Medical ID apps n (%)	Other types n (%)	None n (%)	
Sex	Male	51 (31.5%)	1 (0.6%)	3 (1.9%)	6 (3.7%)	101 (62.3%)	<0.001*
	Female	82 (36.3%)	5 (2.2%)	23 (10.2%)	18 (8%)	98 (43.4%)	
Age	18-20	28 (42.4%)	1 (1.5%)	2 (3%)	6 (9.1%)	29 (43.9%)	<0.001*
	20-30	74 (37.8%)	3 (1.5%)	7 (3.6%)	4 (2%)	108 (55.1%)	
	30-40	15 (27.3%)	2 (3.6%)	6 (10.9%)	7 (12.7%)	25 (45.5%)	
	40-50	16 (22.5%)	0	11 (15.5%)	7 (9.9%)	37 (52.1%)	
Level of education	School	17 (40.5%)	1 (2.4%)	1 (2.4%)	3 (7.1%)	20 (47.6%)	0.27
	University	106 (34.3%)	4 (1.3%)	20 (6.5%)	16 (5.2%)	163 (52.8%)	
	Higher education	10 (27%)	1 (2.7%)	5 (13.5%)	5 (13.5%)	16 (43.2%)	
Type of smartphone	IOS (iPhone)	120 (36.7%)	5 (1.5%)	23 (7%)	19 (5.8%)	160 (48.9%)	0.14
	Android (Samsung or Huawei)	10 (17.5%)	1 (1.8%)	3 (5.3%)	5 (8.8%)	38 (66.7%)	
	Other	3 (75%)	0	0	0	1 (25%)	
Chronic disease	Yes	26 (23.4%)	2 (1.8%)	9 (%)	15 (13.5%)	59 (53.2%)	<0.001*
	No	107 (38.6%)	4 (1.4%)	17 (%)	9 (3.2%)	140(50.5%)	
Chronic medication	Yes	20 (33.9%)	1 (1.7%)	3 (5.1%)	2 (3.4%)	33 (55.9%)	0.8
	No	113 (34.3%)	5 (1.5%)	23 (7%)	22 (6.7%)	166 (50.5%)	

(*) significant p-value <0.05.

of the participants have used it previously (Figures 4 and 5). These results align with the findings reported by Al-Alwan et al. [8] (39.5% awareness and 33% used it).

The reported level of awareness of medical ID features on smartphones was higher in females, subjects aged between 20 and 30 years, those with university education, healthy, and IOS owners. The ease of accessibility and use of medical ID features on smartphones (IOS specifically) and lack of associated cost compared with other medical IDs could explain why younger individuals are more aware of it (Figures 1 and 2). In comparison, older individuals and those with chronic diseases may lack awareness and less interest in exploring new technology, especially if they were not educated about its importance by their HCPs. The awareness level of the medical ID concept in the study participants was (48.71%) which is higher than reported levels by two published studies in Saudi Arabia (32.2%, 33%, respectively) among their participants with increased awareness in males [8,9]. This difference in awareness might be due to the geographical proximity to Makkah since the public of Jeddah is at continuous exposure to people coming for pilgrimage or work from all over the world.

The increased tendency to use the medical ID features on smartphones among the aware group in this study is probably due to rapid revolutions in smartphone features and apps, especially during the corona virus disease, 2019 pandemic era where smartphone use was mandated for permissions during curfew hours. An example is the Tawakkalna app developed by the Saudi Data and Artificial Intelligence Authority to help enforce the curfew and social distancing regulations [10].

The majority of the study participants thought that the medical ID feature on smartphones was beneficial to HCPs (93.8%) and willing to use it in the future (93.5%), which was higher than the level reported by Kaczmarek et al. [3] (60%) in their study. These findings reflect the positive public tendency toward embracing new potentially beneficial health-related technology.

Limitations

This study has several limitations. For instance, this is a cross-sectional study among the public in Jeddah, and its results may not apply to the general population of Saudi Arabia. In addition, the use of a nonprobability convenience sampling technique is a limitation of the study. Another limitation was faced during the literature review is the lack of abundant literature on medical ID features on smartphones.

Conclusion

The measured level of awareness of medical ID features on smartphones among the public in Jeddah is low. However, the participants tend to know and use this type more frequently than other medical IDs. In addition, the ease of use, lack of cost, provision of crucial information, and accessibility of this feature, given that a passcode is not needed to access it, potentially benefit all HCPs in emergencies.

Additionally, this study findings add to the nationwide data on this topic and provide an objective measurement of the level of awareness of the medical ID feature on smartphones which can guide future efforts about educating the public and HCPs about its importance and ease of use.

Finally, future replicate studies in other regions of Saudi Arabia and studies that address the level of awareness of medical ID features on smartphones and the rate of checking the patients' medical ID on smartphones during emergencies by acute-care HCPs, would demonstrate its applicability.

Recommendations

Based on these findings, this study recommends awareness campaigns targeted toward the public and HCPs (emergency personnel and office-based practices) should be initiated to educate them about the medical ID features on smartphones and their potential benefits in communicating critical information about patients.

Acknowledgment

Figure 1: Courtesy of Dr. Abdulelah Abualfraj. Emergency Medicine Department, Ministry of the National Guard - Health Affairs, Jeddah, Saudi Arabia.

Figure 2: Courtesy of Dr. Ahmad Zaher Halawany, Emergency Medicine Department, King Fahd General Hospital, Ministry of Health, Al-Madinah Al-Munawarah, Saudi Arabia.

Figure 4: Contribution of Dr. Faisal Boker. Emergency Medicine Department, Ministry of the National Guard - Health Affairs, Jeddah, Saudi Arabia.

List of Abbreviations:

ID	Identification
HCP	Healthcare provider
App	Application

Conflict of interests

The authors declare that there is no conflict of interest regarding the publication of this article.

Consent to participate

All of the included participants in this study voluntarily consented to participate.

Funding

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Ethical approval

King Abdullah International Medical Research Center (KAIMRC), Ministry of the National Guard - Health Affairs, Saudi Arabia approved the study via Letter number: IRBC/1466/20. Study Number: SP20/300/J. Date of approval: 29 August 2020.

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