Sondus Alraee et al, 2020;1(2):058–062.
https://doi.org/10.24911/SJEMED.72-1588628720



ORIGINAL ARTICLE

# Exploring the awareness of medical identification tag and its uses in emergency situations in Saudi Arabia

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## ABSTRACT

**Background:** A medical identification tag (MIT) can provide vital information about a person's existing medical conditions during the emergency situations. In this study, we aimed to explore the Saudi population's awareness of MITs and their uses as well as factors affecting their knowledge of them.

**Methods:** A cross-sectional study was conducted in five medical cities in Riyadh, Saudi Arabia. A total of 385 participants who met the inclusion criteria were invited to participate in the study. Data were gathered using an electronic questionnaire of 13 items exploring demographics, level of awareness, and uses of MITs.

**Results:** Of 385 participants, 32.2% were aware of MITs. Education level was positively associated with awareness of MITs ($p$ = 0.001). Occupational status and occupation type were significantly associated with awareness of MITs ($p$ = 0.004 and 0.006, respectively). This cohort felt that bracelets (61.3%) and cards (61.3%) were the most effective MITs. Most (87.5%) of the participants felt that MITs are essential for those with diabetes mellitus.

**Conclusions:** Most of the Saudi population lacks the knowledge about MITs. To improve patient safety and ease diagnoses and treatments in emergencies, it is important to educate healthcare workers, colleagues, and the general public about medical conditions that warrant the use of MITs.

**Keywords:** Medical identification tag knowledge, medical identification tag uses, life-threatening medical conditions, emergency.

## Introduction

A medical identification tag (MIT), a symbol or emblem worn by a person diagnosed with a life-threatening medical condition, can be in the form of a bracelet, necklace, or tattoo on the skin, and it contains information needed in an emergency [1]. The specific information might be the person's name, age, blood group, allergies, medical conditions, specific medications, and relevant contact details [2,3]. The purpose of wearing an MIT is to alert healthcare workers, colleagues, or the general public about health conditions requiring immediate medical intervention during an emergency, saving time, and possibly lives [1]. It is a simple intervention that has saved many lives, particularly when the person could not speak at the time, as with young children or unconscious people. An MIT can facilitate immediate optimal management and reduce potentially harmful interventions [1]. Wearing an MIT is a preventative strategy strongly encouraged in the American Diabetes Association Emergency Preparedness Guidelines to prevent diabetic complications such as diabetic hypoglycemia [4,5].

When emergency and paramedical staff initiate patient management, an MIT can be helpful if that patient has any of a number of serious conditions. Chronic heart disease, seizure, diabetes, hypertension, and anaphylaxis are common in Saudi Arabia and require rapid assessment

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**Received:** 05 May 2020 | **Accepted:** 31 May 2020

and treatment to prevent severe consequences, including death [6–10].

Literature describing the importance of MITs in emergency departments and for ambulance personnel is scarce [11]. Most studies have focused on their importance as measures to prevent the consequences of certain treatments for people with specific diseases or they focused on healthcare workers rather than the general public. This study was designed to explore the Saudi population's awareness of MITs and factors that influence their knowledge about these devices.

## Subjects and Methods

This cross-sectional study was conducted at five major medical centers in Riyadh, Saudi Arabia to evaluate the Saudi population's awareness of MITs. Saudi people who visit these hospitals are from rural and urban areas and have varying backgrounds and education levels. This study, conducted between June 2017 and December 2018, was approved by the local Institutional Review Board.

All adults living in central Saudi Arabia and who visited a chosen hospital on the day of the data collection were included if consent to participate was obtained. All acute emergency patients were excluded because they generally required immediate care and could not complete a questionnaire.

The minimum number of participants was determined using Statdisk. Assuming that no prior information was known and that the results for the sample would represent the actual value for the Saudi population within 5% and with 95% confidence, the minimum sample was 385 people. Therefore, 385 men and women meeting the inclusion criteria were recruited from among those at the chosen hospitals who were patients or caregivers. Five departments from each hospital were selected using the Research Randomizer [12].

Data were collected by medical students using a soft copy on an electronic device of an interview-based questionnaire created using Google software. Participants were informed of the nature of the study, and they were required to provide informed consent before participation. Using 30 adults from the general population, the questionnaire was pre-tested to assess whether the items were phrased to be easily understood. Those requiring explanations during pre-testing were noted and, where possible, the translation was modified to improve clarity.

The questionnaire was divided into three sections: demographics, the level of awareness of MITs, and the need for a medical tag when a person has a certain severe or chronic medical condition. The demographic characteristics of interest were sex, nationality, residency, level of education, occupation, and current medical conditions. The level of awareness was measured using four questions addressing the participant's level of knowledge, types of MITs the participant was aware of, the importance of MITs, and the medical conditions for which MITs could be used. Finally, for participants indicating they had existing medical conditions, their own use of MITs was explored, and if not used, the reasons why.

Data were analyzed using Statistical Package for the Social Sciences version 22.0 (IBM Corporation, Armonk, NY). Descriptive analyses of categorical variables were performed using frequencies and percentages. A univariate binary logistic regression was used to evaluate associations between awareness of MITs and participant demographics and medical conditions. The reference demographics were aged 18–24 years, female sex, postgraduate education, currently employed, and with a medical condition. Statistical significance was found when $p < 0.05$.

## Results

Participant demographics are shown in Table 1. While most of the participants were aged less than 35 years, the highest educational level varied: For the greatest proportion ($n$ = 164, 42.6%), it was a bachelor's degree. Medical conditions were reported by 38% ($n$ = 146) of the sample.

One-third ($n$ = 124, 32.2%) of the participants were aware of MITs, mostly among those aged 45–54 years

***Table 1.*** *Demographic characteristics of the participants (n = 385).*

| Demographic characteristics | *n* (%) |
|---|---|
| Gender | |
| Male | 187 (48.6) |
| Female | 198 (51.4) |
| Age (years) | |
| 18–24 | 79 (20.5) |
| 25–34 | 117 (30.4) |
| 35–44 | 91 (23.6) |
| 45–54 | 63 (16.4) |
| 55 and above | 35 (9.1) |
| Education | |
| Postgraduate | 21 (5.5) |
| Bachelor | 164 (42.6) |
| Diploma | 36 (9.4) |
| Secondary school | 108 (28.1) |
| Middle school | 21 (5.4) |
| Elementary | 18 (4.6) |
| None | 17 (4.4) |
| Occupation | |
| Employee | 182 (47.3) |
| Unemployed | 149 (38.7) |
| Student | 54 (14.0) |
| Medical condition | |
| Yes | 146 (38) |
| No | 239 (62) |

($n$ = 23, 36.5% and those aged 35–44 years ($n$ = 33, 26.6%). Proportionally, men were more aware of MITs than women (36.4% *vs.* 28.3%, respectively), and higher levels of education were associated with greater awareness ($p$ = 0.001). Occupation status and occupation type were significantly associated with awareness of MITs ($p$ = 0.004 and 0.006, respectively), but having a medical condition was not (Table 2).

Figure 1 shows the prevalence of various medical conditions among the participants. The most prevalent was diabetes ($n$ = 39, 20.1%) followed by hypertension, epilepsy, respiratory, kidney, hematological, and cardiac diseases. Of all participants, 29.8% noted at least one medical condition, covering a range of neurological, psychiatric, gynecological, gastrointestinal, endocrine, inflammatory, musculoskeletal, dermatological, autoimmune, and infectious diseases as well as some malignancies.

Three types of MITs (necklace, bracelet, and card) were suggested to the participants, and their opinions about the effectiveness of each were investigated. The bracelet and card were selected as the most effective ($n$ = 236, 61.3% and $n$ = 236, 61.3%, respectively) for conveying vital information. Participants were asked to recommended other types of MITs, and responses included medical applications on smartphones, smart cards, and printed signs on clothes. When asked to indicate which medical conditions for which an MIT can be used, the participants most frequently indicated diabetes mellitus ($n$ = 337, 32.6%) as the condition where an MIT is most essential. Uses for MITs that were not specific to medical conditions were also mentioned ($n$ = 13, 1.26%) and included blood type, medications, and malignancies (Figure 2).

Among those with medical conditions ($n$ = 146), 52% did not use an MIT because it was not advised by their physicians. Additionally, 47% indicated that their medical condition was not urgent enough to warrant the use of an MIT. Notably, much of the sample ($n$ = 354, 91.9%) acknowledged the importance of using an MIT.

***Table 2.*** *The association between the awareness of MIT and demographic characteristics of the participants.*

| Demographic characteristics | Awareness | | *p* value |
|---|---|---|---|
| | Yes *n* (%) | No *n* (%) | |
| Gender | | | 0.091 |
| Male | 68 (36.4) | 119 (63.6) | |
| Female | 56 (28.3) | 142 (71.7) | |
| Age (years) | | | 0.566 |
| 18–24 | 23 (29.1) | 56 (70.9) | |
| 25–34 | 37 (31.6) | 80 (68.4) | |
| 35–44 | 33 (36.3) | 58 (63.7) | |
| 45-54 | 23 (36.5) | 40 (63.5) | |
| 55 and above | 8 (22.9) | 27 (77.1) | |
| Education | | | 0.001 |
| Postgraduate | 12 (57.1) | 9 (42.9) | |
| Bachelor | 67 (40.9) | 97 (59.1) | |
| Diploma | 6 (16.7) | 30 (83.3) | |
| Secondary school | 27 (25.0) | 81 (75.0) | |
| Middle school | 7 (33.3) | 14 (66.7) | |
| Elementary | 3 (16.7) | 15 (83.3) | |
| Non | 2 (11.8) | 15 (88.2) | |
| Occupation | | | 0.004 |
| Employee | 73 (40.1) | 109 (59.9) | |
| Unemployed | 34 (22.8) | 115 (77.2) | |
| Student | 17 (31.5) | 37 (68.5) | |
| Medical condition | | | 0.996 |
| No | 77 (32.2) | 162 (67.8) | |
| Yes | 47 (32.2) | 99 (67.8) | |

## Discussion

In this study, we evaluated the awareness of MITs among the Saudi population and factors affecting the level of knowledge about them. About one-third of the study participants knew about MITs, but the level of knowledge was low across all age groups, reflecting their lack of use in the public and a need for creating awareness. Awareness among the Saudi population is related to level of education and occupation. Education level was positively correlated with awareness of MITs, and most of those for whom the bachelor's degree was the highest level of education were employed in higher-ranking jobs, such as those in healthcare, engineering, and business, compared to participants with secondary or elementary levels of education. Therefore, a positive correlation between education level and awareness of MITs follows.

Of the types of MITs suggested, most participants indicated that a card or bracelet was most accessible and visible to others. One-third had a pre-existing medical condition themselves, most predominantly diabetes mellitus (20.1%). Having a medical condition was not a significant predictor of knowledge of MITs: 68% of those with medical conditions were not aware of MITs. However, the vast majority of the sample (91.9%) acknowledged that MITs are important lifesaving tools, especially in those with diabetes (32.6%), given that MITs can inform healthcare providers of current diseases and can guide the immediate actions that must be taken. Greater awareness will result in greater use of MITs.

A similar study in the UK highlighted knowledge about MITs, but targeted healthcare providers and not the general population [9]. Results of that study showed that the general population of the UK was highly aware of MITs and their uses; however, the healthcare providers did not indicate that the presence of an MIT would change their decision in a situation calling for immediate intervention [11]. In Saudi Arabia, though healthcare providers are educated about MITs, they do not expect their patients to have them because of the lack of awareness and knowledge about them.

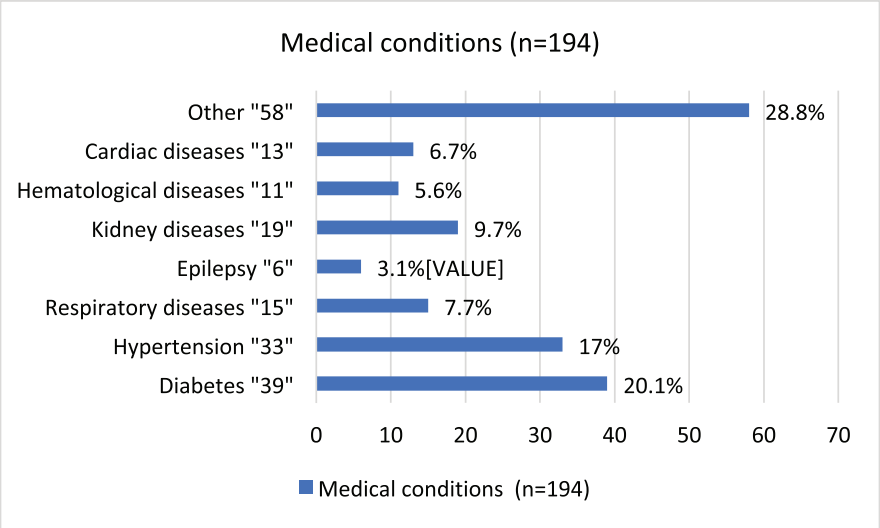


***Figure 1.*** *Existing medical conditions of the participants.*

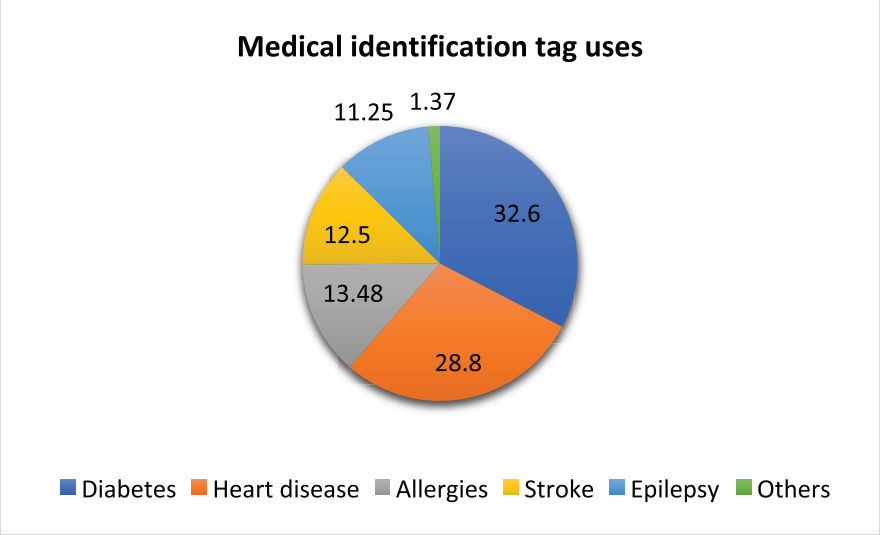


***Figure 2.*** *Medical conditions for which MITs can be used.*

This study had several limitations. For one, it was conducted in healthcare facilities only; however, the structure of the Saudi healthcare system provided a diverse and representative sample of the general Saudi population. Additional studies could be performed in private facilities for comparison. Because our data were collected through interview-based questionnaires from randomly selected participants, our results could be confounded by selection bias. In the absence of local studies on this topic, these results can serve as a baseline for future studies.

## Conclusion

In general, the Saudi population is not aware of MITs, and awareness is associated with level of education and occupation status. However, most Saudis acknowledge that MITs are crucial for patients with specific medical conditions, particularly diabetes. These findings can be used to educate the Saudi population about the uses of MITs in patients with specific diseases and to advocate for further investments in public health interventions to reduce treatment errors that result from a lack of knowledge of underlying conditions in patients. Future studies should focus on awareness among healthcare providers and their attitudes toward MIT use.

**Acknowledgment**

The authors would like to thank Manal Al Makoshi and Raweden Van Onselen for their assistance in reviewing the article and for their comments that greatly improved the manuscript.

**List of Abbreviations**

MIT Medical identification tag

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

**Funding**
None.

**Consent for publication**
Written consent was obtained from all the participants included in the study

**Ethical approval**
Ethical approval was granted by Ethics Committee of King Abdullah International Research Center (IRB/735/17) on 14th of June 2017.

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