

Prevalence of Social Media Use in Patients with ST-Segment Elevation Myocardial Infarction

Hootan Manhoobi¹, Mohammad Reza Beyranvand^{*1}, Mohammad Asadpour Piranfar¹, Saeed Alipour Parsa¹, Ali-Asghar Kolahi², Mehdi Sheibani³, Houra Yeganegi³, Farzam Ahmadipour³, Mohammad Esmail Gheydari¹, Saeid Shahraz⁴

¹ Department Interventional Cardiology, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

² Social Determinants of Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

³ Department of Cardiology, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

⁴ Tufts Medical Center, Boston, MA, United States.

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ABSTRACT

Introduction: Cardiovascular diseases are a leading cause of mortality globally, with health literacy playing a crucial role in predicting mortality rates. Social media has emerged as an effective tool for disseminating information and promoting public health. This study aimed to assess social media usage among patients with ST-elevation myocardial infarction (STEMI).

Methods: This prospective, observational, multicenter study was conducted between July 2021 and August 2023 in Tehran, IRAN. Patients of both genders, over 20 years of age, who experienced STEMI consecutively were included in the study. Data were obtained using questionnaires after obtaining permission.

Results: There were 221 patients, 44.3% (98/221) of patients at the Taleghani Hospital and 55.7% (123/221) at the Shahid Modarres Hospital. The mean age of patients was 57.34 ± 11.30, and 87.3% of patients were male. Totally, 94.5% (209/221) had cell phones, 71.0% (157/221) had smartphones, and 65.6% (145/221) used social networks. WhatsApp was the most commonly used social network, 91.0% (132/145). Patients with higher education had a significantly higher proportion of using email or smartphones. Also, younger patients had a higher proportion of email or smartphone usage.

Conclusions: Most patients diagnosed with STEMI own smartphones and frequently use social networks. WhatsApp is the most commonly used social network platform. However, older individuals or those with lower literacy tend to use social networks less frequently.

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*Corresponding author: Mohammad Reza Beyranvand, Department of Cardiology, Taleghani Hospital, Velenjak Street, Shahid Chamran Highway, Tehran, Iran. Zip code: 1985711151. Tel Mobile: +98 912 134 8366, Tel Work: +98 21 2303 1344, Fax: +98 21 2303 1344, E-mail address: beyran4@yahoo.com

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Introduction

Cardiovascular diseases, including ischemic heart disease, stroke, heart failure, and peripheral arterial disease, remain the leading cause of death worldwide and significantly impact the quality of life (1).

Research findings indicate insufficient health literacy significantly predicts all-cause mortality and cardiovascular-related death in older individuals (2,3).

Social media is a powerful tool to connect, educate, and promote public health. Over the last two decades, social media has become ubiquitous in healthcare and all other facets of society. (4). For example, just in X (Twitter), a staggering 4.9 million tweets were found in the scope of cardiovascular disease, with 550,338 being in English and originating from a US county (5).

Web-based platforms such as blogs (Blogger, WordPress), microblogs (Twitter), social networking sites (Facebook, Reddit), podcasts (The Curbsiders), professional networking sites (LinkedIn, Doximity), and media sharing sites (YouTube, Instagram, and Snapchat) all fall under the umbrella term of social media (4).

Learning media literacy is essential for effectively using social media. The definition of media literacy, according to the Aspen Institute, involves having the capability to analyze, sensitize, and produce information to attain specific outcomes. Over time, this notion has evolved to cover printed information and various forms of symbolic expression and communication, including images and multimedia content (6,7).

This study aimed to evaluate media literacy, social media prevalence, and other aspects of Iranian patients with ST-elevation myocardial infarction (STEMI) who are usually aged above 55 (8).

Materials and Methods

Study Design

This prospective, observational, multicenter study was conducted between July 2021 and August 2023 in Tehran, IRAN.

This study follows the Strengthening the Reporting of Observational Studies in

Epidemiology (STROBE) reporting guideline (9).

Setting

The study took place at the Taleghani Hospital and the Shahid Modarres Hospital. Both centers are affiliated with Shahid Beheshti University of Medical Sciences (SBMU).

Participants

Patients of both genders, over 20 years of age, who experienced STEMI according to the fourth definition of MI (10) consecutively were included in the study.

Variables

Variables such as demographics, clinical characteristics, social media, and health literacy were used for statistical analysis, and all data were gathered during hospital admission.

Data sources/ measurement

Data were obtained using questionnaires in the two hospitals. The questions were asked verbally after obtaining permission from the patients and recorded in the questionnaire sheets.

All the authors vouch for the accuracy and completeness of the data.

Study size

Patients consecutively were included in the study. We expect to reach 250 patients in both centers by August 2023.

Statistical methods

All the statistical analyses were performed using SPSS version 21, SPSS Inc., USA. Continuous variables were presented as mean \pm standard deviation (SD) or median (interquartile range (IQR): 25th percentile - 75th percentile) when appropriate, and categorical variables as percentages (numbers/total number). The Shapiro-Wilk test was used to determine whether variables were normally distributed. Categorical

variables were compared using the Chi-square test or Z-test when appropriate. Spearman's rank correlation coefficients were used to evaluate associations between educational level and the number of patients utilizing social networks. Statistical significance is obtained when $P < 0.05$.

Results

Between July 2021 and August 2023, 221 patients with STEMI were recruited in this study: 44.3% (98/221) of patients at the Taleghani Hospital and 55.7% (123/221) at the Shahid Modarres Hospital. The mean age of patients was 57.34 ± 11.30 (25 to 86 years old), and 87.3% of patients were male (Table 1).

Totally, 94.5% (209/221) had cell phones, 71.0% (157/221) had smartphones, and 65.6% (145/221) used social networks (Figure 1).

Among patients with smartphones, 92.3% (145/157) of patients utilized social networks (Figure 1). Also, 84.5% (131/155) of these patients checked their messages daily.

WhatsApp was the most used social network, 91.0% (132/145).

Local social networks were not popular among patients; only one patient used them (Rubika).

Regarding all patients, 39.6% (86/217) prefer using medical program applications, and 64.9% (137/211) trust these programs and follow the recommendations suggested by physicians.

Most patients, 66.7% (8/12), who did not possess a cell phone were illiterate.

Patients with higher education had a significantly higher proportion of using email or smartphones (Table 3). Also, younger patients had a higher proportion of email or smartphone use (Table 4).

The source of medical information in younger patients, especially those under 45 years of age, was social networks, which were significantly different from other age groups (Table 4).

A moderate linear correlation existed between using social networks and educational level ($r=0.490$, $P<0.001$).

Table 1. Clinical Characteristics of the Patients at Baseline. *

Characteristics	Total (n=221)
Demographics	
Age — yr	57.34 ± 11.30
Male sex — no. (%)	193 (87.3)
Age < 45 — no. (%)	25 (11.3)
Body-mass index — kg/m² ‡	
Median (IQR)	26.57 (24.48-29.56)
Body-mass index ≥ 30 — no. (%)	50 (22.8)
Education — no. (%) ¥	
Illiterate	41 (18.6)
Below diploma	69 (31.4)
Diploma	69 (31.4)
Bachelor	25 (11.4)
Master	11 (5.0)
Doctoral	5 (2.3)
Marital status — no. (%)	
Single	12 (5.4)
Married	209 (94.6)

* Plus-minus values are means ± SD. Percentages may not total 100 because of rounding. IQR denotes interquartile range.

‡ The body-mass index is the weight in kilograms divided by the square of the height in meters. Data were missing for two participants.

¥ Data were missing for a participant.

Discussion

Our study revealed that a vast majority of patients with STEMI possessed mobile phones, with smartphones being the most common type. Additionally, it was found that these patients were active users of social networks, with WhatsApp being the most widely used platform among them. According to a survey conducted by the Iranian Students Polling Agency (ISPA) in May 2022, with a sample size of 1541 individuals aged 18 years and above in IRAN, the proportion of active users of WhatsApp, Instagram, and Telegram among those aged 50 years and above was 41.0%, 17.7%, and 5.5%, respectively (11). Also, TechRasa has estimated that in Iran, around 58.1% of people use WhatsApp, about 57.6% use Telegram, and approximately 53.6% use Instagram as their active social media platforms (12,13).

In April 2020, Statista, a platform that provides business intelligence and data, reported that WhatsApp had 2 billion global users and Instagram had 1 billion global users (14).

Our study and ISPA survey (11) revealed that the amount of social network usage is affected by various factors. Age and education level were significant factors affecting social network usage, at least in IRAN. Besides, other variables such as income, culture, urbanization, and marital status may be confounding and potentially affect social network usage (15).

Another finding of this study is that most patients prefer to use medical applications for follow-up purposes. Also, TV channels were the source of medical knowledge for most patients, and the majority of patients suggested it to improve their medical knowledge. The results provide valuable insights for policymakers to establish a comprehensive nationwide aftercare program and a television campaign to support these individuals. The rapid and broad spread of information is facilitated by this mechanism, which also permits the shaping of discussions by endorsing evidence-based guidelines and offering online consultation, health coaching, and opportunities to improve behavioral

Table 2. Media Information. *

Characteristics	Total (n=221)
Cell phones ‡	
Basic mobile phones	52 (23.5)
Smartphones	157 (71.1)
Social network ¶	
WhatsApp	132 (59.7)
Instagram	25 (11.3)
Telegram	28 (12.7)
Rubika (local social network)	1 (0.4)
E-mail	60 (27.1)
Source of health information ¶	
Friends	45 (20.3)
Social media	54 (24.4)
Book & Paper	13 (5.8)
TV	107 (48.4)
Radio	19 (8.6)
Suggestions to improving health information ¶	
TV	118 (53.4)
Social media	59 (26.7)
Book & Paper	23 (10.4)
Radio	18 (8.1)
Face to face training	12 (5.4)

* Data is presented as numbers (percentages). Percentages may not total 100 due to rounding.

‡ Basic mobile phones, often known as feature phones, are cell phones with minimal functionality, such as simple calling and texting. Smartphones are the most flexible and popular sort of cell phone today, with features and capabilities that go beyond basic talking and messaging. These types of cell phones have become an essential element of modern life, acting as pocket-sized computers.

¶ Each patient may have selected several options or none.

Table 3. Comparison between educational levels. *

Characteristics	Educational levels						Total	X2 (df)	P Value	
	Illiterate	Below diploma	Diploma	Bachelor	Master	Doctoral and above				
E-mail	0 (0.0) _a	6 (9.4) _a	26 (38.2) _b	16 (66.7) _b	7 (63.6) _b	5 (100.0) _b	60 (28.2)	67.8(5)	< 0.001	
Smartphones	10 (24.4) _a	45 (65.2) _b	61(88.4) _c	25 (100.0) _c	10 (90.9) _b , _c	5 (100.0) _{b,c}	156 (70.9)	68.7(5)	< 0.001	
Social network	WhatsApp	8 (20.5) _a	35 (57.4) _b	54 (81.8) _c	19 (79.2) _{b,c}	10 (90.9) _b , _c	131 (63.6)	50.6(5)	< 0.001	
	Telegram	1 (2.6) _a	3 (4.9) _a	13 (19.7) _{a,b}	5 (20.8) _{a,b}	3 (27.3) _{a,b}	28 (13.6)	22.0(5)	0.001	
	Instagram	0 (0.0) _a	7 (11.5) _{a,b}	8 (12.1) _{a,b}	7 (29.2) _b	2 (18.2) _{a,b}	1 (20.0) _{a,b}	25 (12.1)	12.6(5)	0.027
Source of health information	Relative & Friends	13 (32.5) _a	13 (19.7) _a	11 (16.2) _a	4 (16.0) _a	2 (18.2) _a	45 (20.9)	5.7 (5)	0.332	
	Social media	2 (5.0) _a	11 (16.7) _{a,b}	26 (38.2) _b	11 (44.0) _b	3 (27.3) _{a,b}	54 (25.1)	22.1(5)	< 0.001	
	Book & Paper	0 (0.0) _a	1 (1.5) _a	3 (4.4) _{a,b}	2 (8.0) _b	3 (27.3) _{b,c}	4 (80.0) _c	13 (6.0)	62.3(5)	< 0.001
	TV	22 (55.0) _{a,b}	40 (60.6) _b	33 (48.5) _{a,b}	6 (24.0) _a	4 (36.4) _{a,b}	1 (20.0) _{a,b}	106 (49.3)	12.7(5)	0.026
	Radio	5 (12.5) _a	6 (9.1) _a	5 (7.4) _a	1 (4.0) _a	1 (9.1) _a	1 (20.0) _a	19 (8.8)	2.3 (5)	0.798

* Variables are present as numbers (percentages). Each subscript letter denotes a subset of education categories whose column proportions do not differ significantly from each other at the .05 level.

Table 4. Comparison between Ages. *

Characteristics	Age			Total	X2 (df)	P value	
	<45	45-65	≥65				
E-mail	14 (56.0) _a	42 (29.8) _b	4 (8.3) _c	60 (28.0)	19.1 (2)	< 0.001	
Smartphones	23 (92.0) _a	110 (74.8) _a	24 (49.0) _b	157 (71.0)	17.9 (2)	< 0.001	
Social network	WhatsApp	18 (72.0) _a	94 (70.1) _a	20 (41.7) _b	132 (63.8)	13.2 (2)	0.001
	Telegram	7 (28.0) _a	21 (15.7) _a	0 (0.0) _b	28 (13.5)	12.5 (2)	< 0.002
	Instagram	11 (44.0) _a	12 (9.0) _b	2 (4.2) _b	25 (12.1)	28.0 (2)	< 0.001
	Relative & Friends	7 (28.0) _a	31 (21.7) _a	7 (14.6) _a	45 (20.8)	1.9 (2)	0.372
Source of health information	Social media	13 (52.0) _a	35 (24.5) _b	6 (12.5) _b	54 (25.0)	13.7 (2)	0.001
	Book & Paper	3 (12.0) _a	10 (7.0) _{a, b}	0 (0.0) _b	13 (6.0)	4.8 (2)	0.86
	TV	7 (28.0) _a	67 (46.9) _a	33 (68.8) _b	107 (49.5)	12.1 (2)	0.002
	Radio	2 (8.0) _a	10 (7.0) _a	7 (14.6) _a	19 (8.8)	2.6 (2)	0.272
	Face-to-face training	1 (4.0) _a	7 (4.7) _a	4 (8.5) _a	12 (5.6)	0.9 (2)	0.608
Suggestions for improving health information	Social media	14 (56.0) _a	41 (28.9) _b	5 (10.6) _c	60 (28.0)	16.7 (2)	< 0.001
	Book & Paper	2 (8.0) _a	18 (12.7) _a	2 (4.3) _a	22 (10.3)	2.8 (2)	0.238
	TV	8 (32.0) _a	74 (52.1) _a	36 (76.6) _b	118 (55.1)	14.6 (2)	0.001
	Radio	0 (0.0) _a	15 (10.6) _a	3 (6.4) _a	18 (8.4)	3.4 (2)	0.183

* Variables are present as numbers (percentages). Each subscript letter denotes a subset of Education categories whose column proportions do not differ significantly from each other at the .05 level.

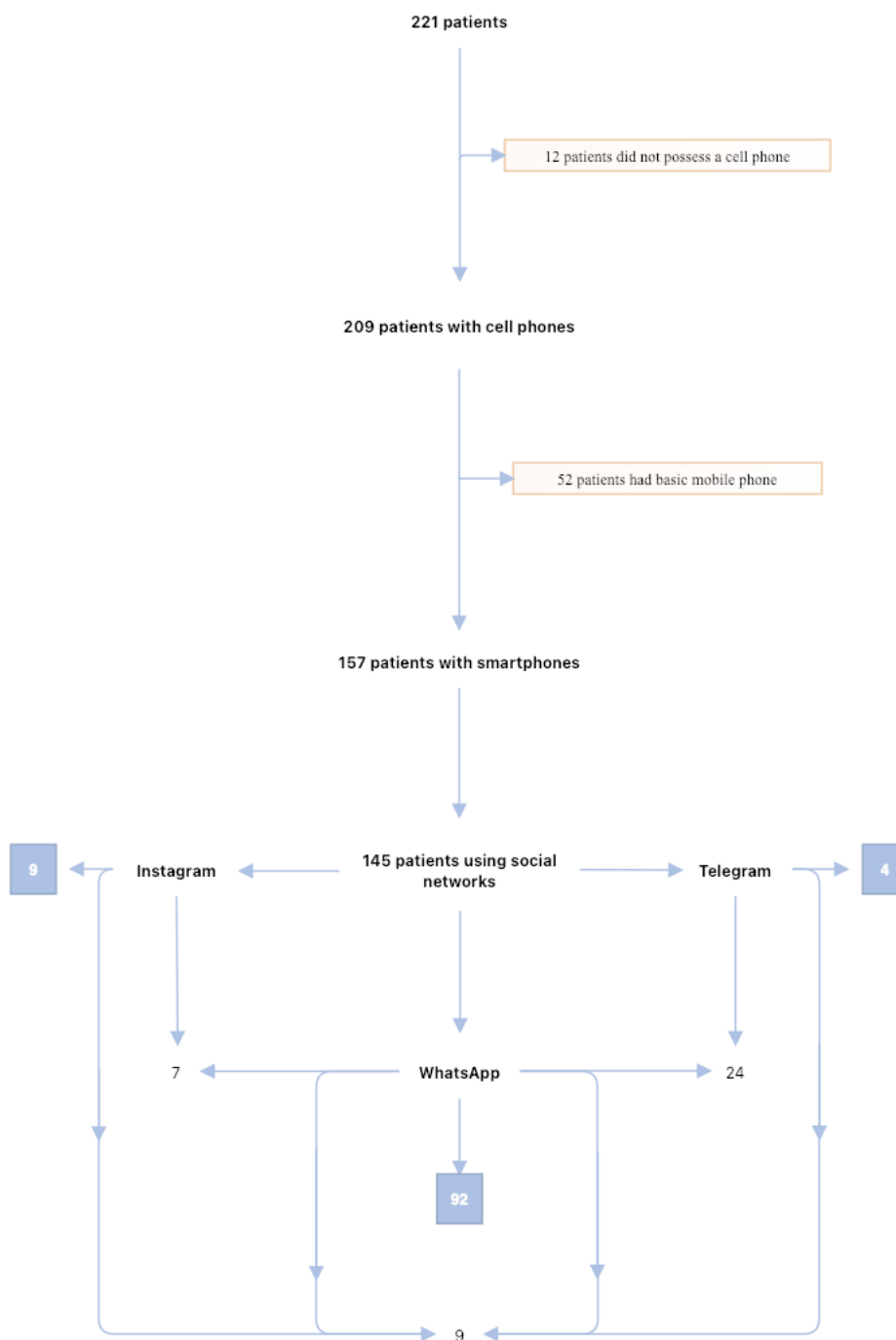


Figure 1. Flow chart of patients.(The number inside the blue square indicates the number of people who use only that social network.)

interventions, medication compliance, and surveillance. Multiple studies have demonstrated that implementing this approach in STEMI patients decreases mortality rates, lowers healthcare expenditures, and improves life quality (16-22). Although using this strategy has essential benefits, some limitations must be

considered. There were 12 limitations of social media for health communication, and the main recurring limitations of social media are quality concerns and the lack of reliability of health information (4).

Unfortunately, data is very limited in this area, especially among STEMI patients. Most studies have been conducted on social media,

focusing primarily on the three most popular platforms worldwide: Facebook, YouTube, and Twitter (5,23-26). For the best use of this potential opportunity and future policymaker decisions, more studies are required.

Limitation

It is important to note that the findings of this study cannot be generalized to other populations across the country due to numerous previously discussed factors that can significantly affect the results.

Conclusion

Most patients diagnosed with STEMI own smartphones and frequently use social networks. WhatsApp is the most commonly used social network platform. However, older individuals or those with lower literacy tend to use social networks less frequently.

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