

## Original Articles

# Influence of social media on health-related decision-making among adults attending an outpatient department of a tertiary care centre in India: A cross-sectional analytical study

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### ABSTRACT

**Background.** Social media platforms, especially Facebook and WhatsApp, can spread public health information effectively. We aimed to estimate the influence of health-related messages circulated through these social media platforms on health-related decision-making and its associated factors.

**Methods.** We did a cross-sectional analytical study among adults (aged  $\geq 18$  years) who visited the outpatient department of a tertiary care hospital in suburban West Bengal, during July–September 2021. A structured questionnaire was used regarding receiving health-related messages on social media and the subsequent effect on health-related decision-making in the past year.

**Results.** A total of 673 individuals participated in the study. Their mean (SD) age was 34.4 (10.2) years and 56.8% (382) were men, 50.8% (342) were graduates, 63.6% (428) were from rural areas and 82.9% (558) were active users of more than one social media platform. A total of 474 (70.4%; 95% CI 67.0–73.9) study participants reported health-related decision-making based on social media messages, whereas 44.7% (301) reported checking the authenticity of forwarded messages or posts or updates with healthcare professionals before making a decision. On adjusted analysis, participants who had secondary education (adjusted prevalence ratio [aPR] 1.40; 95% CI 1.01–1.94), used both the media (aPR 1.31; 95% CI 1.09–1.58) and checked the authenticity of the messages with a healthcare

professional (aPR 1.52, 95% CI 1.38–1.68) were significantly more influenced by the messages, posts or updates received on social media platforms.

**Conclusion.** WhatsApp forwards or updates and Facebook posts or updates influence health-related decision-making among the Indian adult population.

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### INTRODUCTION

More than half of the global population uses social media platforms such as Facebook, Twitter, or WhatsApp to connect, communicate and share information.<sup>1</sup> Due to the instant circulation, social media platforms can reach many people in the shortest time compared to ‘traditional’ mass media. This warrants a quality control check of the content entering into these platforms by a gatekeeper or editor to filter out irrelevant or dubious information. Unfortunately, the information, including health-related messages, shared on these platforms remains uncontrolled, unsupervised and unfiltered creating confusion or an infodemic.<sup>2</sup> Infodemic is the overabundance of information that makes it hard for people to find trustworthy sources and reliable guidance when needed.<sup>3</sup> The plethora of data has become more evident during the Covid-19 pandemic, and this infodemic has rightly been described as the ‘second disease’ accompanying Covid-19.<sup>4</sup>

Infodemic usually comprises a mixture of ‘real’ and fake information. A broad range of content comes under the banner of fake information concerning the health sector and is classified as either misinformation or disinformation. Misinformation is inaccurate information that may have been communicated without any intention to cause harm.<sup>5</sup> Disinformation is false information created and shared deliberately to cause damage.<sup>6</sup> The presence of health-related incorrect information was noticed on social media even before the Covid-19 pandemic.<sup>7–9</sup> Unfortunately, during the pandemic, an immense volume of false information regarding diagnosis and treatment and notification of lockdown guidelines (mass movement restrictions) were circulated on social media, which created considerable confusion.<sup>10</sup> Disinformation related to the Covid-19 vaccine that has been widely circulated on social media has considerably affected the success of the vaccination drive in its initial stage in many countries.<sup>11</sup>

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The performance of traditional media is steadily decreasing as a method of disseminating health-related messages. In contrast, social media platforms such as Facebook and WhatsApp provide cost-effective health promotional strategies.<sup>12-14</sup> These can even be used as platforms for various aspects of patient care, including investigations, diagnosis, patient monitoring and research.<sup>15,16</sup> Considering the quantum of use, utility and limitations of social media platforms in spreading health-related information, we must assess the influence of information available on social media platforms on health-related decision-making on the population.

However, there is limited literature regarding the influence of social media platforms on an individual's choice for their own or family member's health, more so in a low- and middle-income country such as India.<sup>17</sup> With the upsurge of social media consumers in the second-most populous country in the world, further research is required to know what percentage of people make decisions about health based on health messages and which factors affect users' acceptance of this technology and approval of the content. We aimed to estimate the proportion of people deciding on their personal or family healthcare based on WhatsApp forwards or status updates or Facebook posts or updates and the factors associated with their chances of being influenced.

## METHODS

We did this hospital-based cross-sectional analytical study at the outpatient department (OPD) of a tertiary care centre in suburban West Bengal, located 50 kilometres from Kolkata. On average, 200 patients attend the OPD daily. The centre had no inpatient department and diagnostic facility when the study was conducted. However, all the specialty clinics were being run and a nominal fee was charged.

All adults (aged  $\geq 18$  years) using either WhatsApp or Facebook as social media platforms and visiting the OPD between July and September 2021 were eligible to participate.

Every tenth patient was approached using a systematic sampling technique. Assuming social media platforms influence 68.3% of the population in their decisions regarding their family's healthcare after receiving health-related messages, with an alpha value of 0.05 and 5% as relative precision, the estimated sample size required was 719.<sup>18</sup>

We used a structured questionnaire for the personal interviews.<sup>18</sup> A panel of experts consisting of researchers, a social media expert and an epidemiologist, who were familiar with the construct that the questionnaire was intended to assess, evaluated the content validity of the questionnaire in a previous study.<sup>19</sup> Sociodemographic, behavioural and details of comorbid conditions were asked in the first section. Participants who consumed medication for any disease for the past 6 months were considered to suffer from a chronic illness. The second part consisted of information regarding health-related messages received on social media. They were asked which social media platforms were used (Facebook or WhatsApp, or both), whether they received health-related forwards or updates on WhatsApp and health-related posts or updates on Facebook and their frequency on each platform in the past month, and whether such messages influenced their healthcare decisions in the previous 12 months. They were also asked if these messages affected their healthcare decisions, started or stopped treatment based on the information, if they felt health-related messages must provide relevant pictures and

if government health organizations should use such platforms in their health campaigns.

Regarding the legitimacy of the messages, we enquired if the participants cross-checked by contacting any healthcare worker (accredited social health activists [ASHAs], auxiliary nurse midwives [ANMs], multipurpose workers [MPWs], staff nurses and physicians) either physically or on social platforms. The translation of the questionnaire in Bengali (local language) was cross-checked by translating back to English. It was pretested in 50 individuals and modified accordingly.

We considered a message to be health-related or linked to health if at least any of the two following conditions were met:

1. Any statement about any health domain including physical, social, mental, environmental, financial or spiritual health. For example, 'daily performing yoga decreases your chance of heart attack' is relevant to physical health.
2. Personal experiences of an individual. For example, 'I used to consume this specific brand of antacids daily for the past year. Now I do not have any joint pain.'

As mentioned above, the operational definition of health messages was precisely mentioned to the participants to clarify what the study intended by health messages.

Data were collected using three trained nursing officers (NOs) under the supervision of faculty members and resident doctors of the Departments of Community Medicine and Family Medicine, and Otorhinolaryngology. NOs were sensitized regarding the study's objectives, the confidentiality of information, and participants' rights and were also trained to administer the questionnaire to the participants. If a patient visited alone, they were approached to check for eligibility. If attendees accompanied the patient, only one participant among the patient and attenders was included in the study using a lottery method. If the tenth individual was ineligible, the next person standing in the queue was approached. Data were collected using standard precautions in a separate kiosk after the individuals attending the OPD building were screened for Covid-19 and were registered for their OPD visit. The participants were contacted only once for the study, and data collection was done five times a week.

Ethical approval was obtained from the Institute Ethics Committee (IEC). Informed consent was taken before the questionnaire was administered to the study participants.

Data were collected using EpiCollect version 5.0 and analysed using Stata version 14 (Stata Corp, College Station, TX, USA). Participants responding 'always' or 'sometimes' to 'Do WhatsApp health-related forwards or updates or Facebook health-related posts or updates influence your decisions regarding your or your family's health care in the last year?' were deemed to be influenced by the health-related messages. This outcome variable was expressed as a proportion with a 95% confidence interval (CI). Chi-square test was done to identify factors associated with this decision-making, and variables with a  $p$  value  $< 0.2$  were considered for regression to assess the independent effects. We used generalized linear model command with family Poisson and log link to calculate the adjusted prevalence ratio (aPR) with 95% CI. A  $p$  value of  $< 0.05$  was considered statistically significant in the final model.

## RESULTS

A total of 719 eligible individuals were contacted, of which 673 were included in the study. Forty-six individuals refused to

participate, citing they were in a hurry to meet their physician, making the response rate 93.6%.

The mean (SD) age was 34.4 (10.2) years, with 56.8% (382) being men. Of the total, 50.8% (342) were graduates, 18% (121) were not working at the time of the study, and 63.6% (428) were from rural areas (Table I). Comorbid conditions were present in 22.1% (149) and included hypertension (77, 11.4%), diabetes (65, 9.7%), hypothyroidism (51, 7.6%) and coronary artery disease (7, 1%). Of the total, 82.9% (558) used both WhatsApp and Facebook, and 44.7% (301) checked the authenticity of the health-related messages with a healthcare professional.

A total of 474 (70.4%; 95% CI 67.0–73.9) participants decided on their personal or family healthcare based on the health-

related WhatsApp forwards or updates or health-related Facebook posts or updates or both in the past year. Of 651 (96.7%) participants using WhatsApp and 580 (86.2%) participants using Facebook, 64.4% (419) and 84.3% (489) received forwards and posts, respectively (Table II). Of all the participants, 62.4% (420) felt that health-related messages must provide relevant pictures, and 7% (47) and 4.2% (4.2) had ever in their lifetime started and stopped, respectively, medications/treatment as advised/advertised on social media without asking a physician (Table II).

Education, chronic disease condition, media platform used and checking the messages' authenticity were the variables associated with the primary outcome of being influenced by

TABLE I. Sociodemographic, morbidity and social media use, and its association with getting influenced by health-related messages among the study participants ( $n=673$ )

Characteristic	$n$ (%) <sup>*</sup>	Messages influenced decision $n$ (%) <sup>*</sup>	Bivariate analysis		Multivariable analysis	
			$\chi^2$	$p$ value <sup>†</sup>	aPR (95% CI)	$p$ value <sup>‡</sup>
<i>Age group (in years)</i>						
18–39	465 (69.1)	324 (68.4)	1.05	0.59	–	–
40–59	201 (29.9)	144 (30.4)				
≥60	7 (1.0)	6 (1.3)				
<i>Gender</i>						
Men	382 (56.8)	272 (57.4)	0.25	0.62	–	–
Women	291 (43.2)	202 (42.6)				
<i>Education (years of schooling)</i>						
Primary (1–7)	32 (4.8)	15 (3.2)	9.46	0.01	1	
Secondary (8–12)	299 (44.4)	210 (44.3)			1.40 (1.01–1.94)	0.04
Graduation (>12)	342 (50.8)	249 (52.5)			1.37 (0.99–1.90)	0.06
<i>Occupation</i>						
Government/private employee	179 (26.6)	136 (28.7)	4.17	0.24	–	–
Self-employed	183 (27.2)	123 (26.0)				
Home-maker	190 (28.2)	129 (27.2)				
Not working at present	121 (18.0)	86 (18.1)				
<i>Resident</i>						
Rural	428 (63.6)	301 (63.5)	<0.01	0.94	–	–
Urban	245 (36.4)	173 (36.5)				
<i>Tobacco consumption</i>						
Never/quit in past year	497 (73.8)	351 (74.1)	0.03	0.85	–	–
Occasional/daily	176 (26.2)	123 (26.0)				
<i>Alcohol consumption</i>						
Never/quit in last year	530 (78.7)	371 (78.3)	0.22	0.64	–	–
Social/daily	143 (21.3)	103 (21.8)				
<i>Per capita monthly income<sup>§</sup></i>						
Upper class	183 (28.2)	134 (29.3)	4.20	0.38	–	–
Upper middle class	233 (35.9)	168 (36.8)				
Middle class	117 (18.0)	82 (17.9)				
Lower middle class	93 (14.3)	59 (12.9)				
Lower class	23 (3.5)	14 (3.1)				
<i>Presence of chronic disease</i>						
Yes	149 (22.1)	96 (20.3)	3.31	0.07	1	
No	524 (77.9)	378 (79.8)			1.07 (0.95–1.21)	0.24
<i>Social media platforms used</i>						
WhatsApp only	93 (13.8)	49 (10.3)	20.16	<0.01	1	
Facebook only	22 (3.3)	12 (2.5)			1.04 (0.69–1.61)	0.84
Both	558 (82.9)	413 (87.1)			1.31 (1.09–1.58)	<0.01
<i>Checked authenticity of messages</i>						
Yes	301 (44.7)	265 (55.9)	81.08	<0.01	1.52 (1.38–1.68)	<0.01
No	372 (55.3)	209 (44.1)			1	

aPR adjusted prevalence ratio CI confidence interval \* column percentage † based on chi-square test ‡ based on generalized linear model command, included variables that had a  $p$  value of <0.2 in chi-square test § based on updated BG Prasad scale (2021), available at [www.jiaphd.org/text.asp?2021/19/2/154/322865](http://www.jiaphd.org/text.asp?2021/19/2/154/322865), 24 (3.6%) did not respond to this question

TABLE II. Social media usage characteristics regarding health-related messages received by the study participants (*n*=673)

Characteristic	<i>n</i> (%)
<i>Received health-related WhatsApp forwards or updates*</i>	
Yes	419 (64.4)
Daily	156 (37.2)
More than once a week	196 (46.8)
Once a week	67 (16.0)
No	232 (35.6)
<i>Received health-related Facebook posts or updates†</i>	
Yes	489 (84.3)
Daily	163 (33.3)
More than once a week	252 (51.5)
Once a week	74 (15.1)
No	91 (15.7)
<i>Health-related messages influenced decisions regarding the individual or their family's healthcare</i>	
Always	115 (17.1)
Sometimes	359 (53.3)
Never	199 (29.6)
<i>Ever started any medications/treatment as advised/advertised on social media without asking a physician</i>	
Yes	47 (7.0)
No	626 (93.0)
<i>Ever stopped any medications/treatment as advised/advertised on social media without asking a physician</i>	
Yes	28 (4.2)
No	645 (95.8)
<i>Felt health-related messages must provide relevant pictures</i>	
Yes	420 (62.4)
No	253 (37.6)
<i>Agree that government health organizations should use WhatsApp or Facebook in their health campaigns</i>	
Yes	556 (82.6)
No	117 (17.4)

\*Among 651 (96.7%) WhatsApp users    †Among 580 (86.2%) Facebook users

messages (Table I). In adjusted analysis, participants who had secondary education compared to primary were significantly 40% (aPR 1.40; 95% CI 1.01–1.94) more influenced, and usage of both the media compared to WhatsApp only was significantly 31% (aPR 1.31; 95% CI 1.09–1.58) more common among the influenced people. Similarly, independent of all other factors, those who checked the authenticity of the messages with a healthcare professional were significantly 52% (aPR 1.52; 95% CI 1.38–1.68) more influenced than those who did not check.

## DISCUSSION

Our study assessed adult individuals' influence of health-related messages on social media on health-related decision-making. Unlike the past century, the availability of smartphones and internet connection has revolutionized access to information for ordinary people in the 21st century. This has created an immense opportunity for healthcare providers to address critical issues relating to health in a novel setting.<sup>20</sup> We found that almost two-thirds of WhatsApp users and four-fifths of Facebook users had received health-related forwards or updates and posts or updates, respectively, at least once a week.

Social media platforms are effective in creating public health awareness and behaviour change.<sup>21</sup> We found that about 70% of study participants were influenced by health-related messages on social media platforms. This might appear enormously encouraging for public health policy-makers. However, at the same time, there is a considerable risk of developing false beliefs due to the preponderance of unverified health-related messages available over social media platforms. A study by Suarez-Lledo

and Alvarez-Galvez suggested that the health-related messages on social media platforms often carry wrong information.<sup>22</sup> The population segment with low health literacy often fails to verify the authenticity of the information from a physician because they do not have access or do not find it relevant to verify the information and get easily influenced by the information.<sup>23</sup> We too found that only 45% of study participants verified the authenticity of the information they received. An earlier study in Saudi Arabia among social media users reported a similar proportion verified the authenticity of the information.<sup>18</sup>

Contrary to popular belief, individuals with a secondary level of education were more influenced by the information received on social media than individuals with primary education. It can be assumed that people with higher education levels will verify the authenticity of health messages and will be influenced accordingly. People with higher education have a better understanding of the information and are subject to the rapid adoption of behaviour change.<sup>24</sup> However, as English is the most common language used on these platforms, there was a possibility that people with less education could not read or understand the information and were less influenced. However, we could not check the authenticity of the content they received. Individuals who used Facebook and WhatsApp were more influenced by the health-related posts or updates and health-related forwards or updates, respectively. An explosive gathering of information on the same topic from different sources causes cognitive overload, and people fail to focus on the logic and evidence of the information, thereby getting influenced easily.<sup>25</sup>

We found that 7% of participants started new medication independently, and 4.2% stopped medication prescribed by a physician after seeing health-related messages over social media. Though the proportion is less than earlier studies conducted outside India, it still poses a considerable threat for policy-makers as the prevalence of self-medication is already high in India.<sup>18,26</sup>

Our findings suggest the vast untapped potential of social media platforms. With the increase in users, policy-makers can consider integrating 'traditional' health communication channels with these platforms to create public health awareness of compelling public health challenges. The vertical programmes can collaborate with social media platforms to reach audiences who prefer to receive health information through the 'online' mode. Nevertheless, the communication process does not need to be part of long-term strategic health promotion plans but also can be relevant time-sensitive information. Citizens can then disseminate the health-related messages, and government agencies and influencers need to play the role of a catalyst. The messages can be portrayed as visuals or infographics to educate diverse sections of a community regardless of language or education level, skipping the use of scientific jargon. However, it is also necessary to inform the common person to check the credibility of the information or its source before sending or updating their platforms. We believe that government agencies must take action to continuously check social media data to identify fake information and stop its propagation. People often start sharing forwards, posts or updates with their friends, relatives and colleagues without checking the authenticity or factual correctness and fail to identify credible information.<sup>27</sup> There are many techniques to improve the digital health literacy of the general population to halt the snowballing of false information.<sup>28</sup>

This is one of the first studies where the effect of social media platforms on health-related decision-making was assessed in an Indian setting. Our study has a few limitations. It was a hospital-based study, so the findings could not be generalized to the community level. We did not include social media platforms such as Twitter and Instagram in our survey as the use of these platforms were minimal among the target population.

### Conclusion

WhatsApp forwards or updates and Facebook posts or updates influence health-related decision-making among Indian adults. Higher education, using multiple platforms and cross-checking the authenticity of the messages plays a critical role in decision-making.

*Conflicts of interest.* None declared

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