https://doi.org/10.35845/kmuj.2026.23865

ORIGINAL ARTICLE

Digital professionalism and social media use among healthcare workers in tertiary care hospitals of Peshawar, Pakistan: a cross-sectional study

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Date Submitted: November 30, 2024

Date Revised: March 03, 2026

Date Accepted: March 10, 2026

ABSTRACT

Objective: To examine digital professionalism and social media use among healthcare workers in tertiary care hospitals of Peshawar, Pakistan.

Methods: This cross-sectional analytical study was conducted from July-September 2024 at three tertiary care hospitals in Peshawar: Khyber Teaching Hospital, Hayatabad Medical Complex, and Lady Reading Hospital. A total of 301 healthcare workers (doctors, nurses, and paramedics) who were active social media users were recruited through convenience sampling. Data were collected using a validated 27-item questionnaire assessing digital professionalism across eight domains. Responses were recorded on a 5-point Likert scale. Data were analyzed using SPSS version-23.

Results: The mean age of participants was 32.62±7.83 years, with a predominance of males (73.4%). Doctors constituted 59.1% of the sample. Most participants reported daily use of technology (80.1%) and engagement in digital professional networks (59.5%), with WhatsApp being the most used platform (44.9%). High levels of adherence were observed in domains of confidentiality (78.1%), respect for colleagues (82.1%), and ethics (77.1%). However, gaps were noted in conflict-of-interest disclosure, with 22.6% never reporting financial or commercial interests. The mean digital professionalism score was highest among doctors (116.96), followed by nurses (112.94) and paramedics (111.74), with a statistically significant difference between groups (F=3.61, p=0.02).

Conclusion: Healthcare workers in Peshawar demonstrated generally high levels of digital professionalism, with comparatively higher scores among doctors, particularly in domains of ethical conduct and confidentiality. However, gaps in conflict-of-interest disclosure and boundary management persist. Targeted training and clear institutional guidelines are recommended to promote responsible social media use in healthcare settings.

Keywords: Health-care Professionals (MeSH); Professionalism (MeSH); Ethics, Professional (MeSH); Internet (MeSH); Health Personnel (MeSH); Health Professional (MeSH); Attitude of Health Personnel (MeSH); Digital tools (Non-MeSH); Communication (MeSH); Social Media (MeSH).

THIS ARTICLE MAY BE CITED AS: Ali I, Adeeb H, Iqbal F, Khan A. Digital professionalism and social media use among healthcare workers in tertiary care hospitals of Peshawar, Pakistan: a cross-sectional study. Khyber Med Univ J 2026;18(1):100-7. https://doi.org/10.35845/kmuj.2026.23865

INTRODUCTION

Social media integration has remarkably increased in all sectors of life and has led to transformation of communication and dynamics of networking in all fields including health sector. Its use has been further intensified in COVID-19 pandemic, promoting discourse and swift distribution of novel information.[1] Social media provides new channels for professional growth and patient interaction, although it poses problems for healthcare practitioners, who must manage digital proficiency with upholding decorum and professionalism in online communities.[2] Digital professionalism, characterized by the ethical, responsible and effective utilization of digital technologies and platforms in professional settings, is crucial for maintaining confidentiality, integrity and public trust in healthcare.[3]

With the progression of digital technologies, healthcare practitioners must modify their methods to align with the requirements of a digital environment. Examining the utilization of social media by professionals, its influence on patient care and public perception, and methods to uphold professionalism are essential topics of research.

Social media platforms such as Facebook, Twitter, LinkedIn, and Instagram have transformed communication by enabling healthcare professionals to share knowledge, collaborate with colleagues, and engage with patients beyond traditional boundaries.[4] However, their use raises important concerns related to privacy, confidentiality, boundary management, and professional reputation.[5]

Concerns regarding digital professionalism have been increasingly highlighted by regulatory bodies and academic institutions. In the United States, commonly reported violations include inappropriate patient interactions, misrepresentation of credentials, and internet-based prescribing practices.[6] Similarly, a systematic review has documented unethical behaviors on social media and the erosion of professional norms.[7] Instances of unprofessional online conduct have led to legal and professional consequences worldwide, including in Australia.[8] Despite the availability of guidelines addressing the ethical use of social media, their

practical implementation and effectiveness in promoting digital professionalism remain uncertain.[9] Moreover, limited evidence exists on how social media can be harnessed to positively support professional conduct, particularly in resource-constrained and underrepresented settings.[10]

Although research on digital professionalism among healthcare practitioners is expanding, most studies are conducted in Western contexts and do not adequately reflect the cultural, social, and regulatory realities of regions such as Pakistan, particularly Khyber Pakhtunkhwa. In addition, existing literature largely focuses on medical students, with insufficient attention to practicing healthcare professionals, including physicians, nurses, and paramedical staff, who are actively engaged in patient care and digital communication.

Furthermore, previous work by Vukušić Rukavina T, et al.,[11] has emphasized the need to explore emerging social media platforms, evaluate the effectiveness of existing guidelines, and develop context-specific educational interventions tailored to different healthcare professions.

Considering these gaps, the present study was planned to examine digital professionalism and the use of social media among healthcare workers in tertiary care hospitals in Peshawar, Pakistan.

METHODS

This cross-sectional analytical study was conducted from July to September 2024 in three tertiary care hospitals in Peshawar, Pakistan: Khyber Teaching Hospital (KTH), Hayatabad Medical Complex (HMC), and Lady Reading Hospital (LRH).

The sample size was estimated using Cochran's formula for cross-sectional surveys, assuming a 95% confidence level, 5% margin of error, and an expected proportion of 50%, which yielded a required sample of approximately 384 participants. However, due to the use of convenience sampling and voluntary participation, a total of 301 healthcare workers completed the survey. This sample size was considered adequate for descriptive and inferential statistical analyses in behavioral research.[12]

The study population included doctors, nurses, and paramedical staff actively involved in patient care and licensed in their respective professions. Regular social media users, defined as individuals actively viewing and posting on social media platforms over the preceding six months, were included in our study. Participants who were not active social media users were excluded. Convenience sampling was employed to recruit all eligible healthcare professionals across the study sites.

The study was approved by the Advanced Studies and Research Board of Khyber Medical University (KMU), Peshawar, Pakistan (Reference #: DIR/KMU/AS&RB/LO/002821; dated: September 24, 2024). Ethical approval was obtained from the Ethics Board of the Institute of Health Professions Education and Research (IHPER), KMU, Peshawar, Pakistan (Reference #: 1-12/IHPER/MHPE/KMU/24-12; dated: October 21, 2024). Institutional permissions were secured from KTH, LRH, and HMC. Written informed consent was obtained from all participants, and confidentiality was ensured through anonymization of data.

Eligible participants were approached via emails and official WhatsApp groups facilitated by institutional administrators. Data were collected using a validated questionnaire, adopted with permission from a previously published study by Imran S, et al.,[13] assessing digital professionalism among healthcare professionals using social media.

The questionnaire consisted of two sections: demographic characteristics and assessment of digital professionalism across eight domains, comprising a total of 27 items. These domains included self-anonymity (3 items), privacy settings (4 items), maintaining boundaries (3 items), confidentiality (3 items), conflict of interest (3 items), accountability (4 items), respect for colleagues (3 items), and ethics (4 items). Responses were recorded on a 5-point Likert scale ranging from 1 (Never) to 5 (Always), yielding a total possible score of 27 to 135.

Data were analyzed using SPSS version 23. Descriptive statistics were computed as mean and standard deviations for continuous variables and frequencies with percentages for categorical variables. Likert-scale responses were summed to generate a composite professionalism score, which was treated as an approximately continuous variable. Mean professionalism scores among doctors, nurses, and paramedical staff were compared using one-way analysis of variance (ANOVA). This approach consists of established practices in social science and health professions education research, where aggregated Likert-scale scores are analyzed using parametric methods.[14]

RESULTS

The mean age of the participants (n=301) was 32.62±7.83 years, with a mean working experience of 2.93±1.22 years. Males constituted most of the sample (n=221, 73.4%). Most participants were doctors (n=178, 59.1%), followed by paramedical staff (n=72, 23.9%).

Regarding work experience, 90 (29.9%) participants had 1-5 years of experience, while 74 (24.6%) had 11-15 years. Only 34 (11.3%) had more than 15 years of experience, indicating that a large proportion of participants were in the early stages of their careers. In terms of educational attainment, 113 (37.5%) held a doctorate or professional degree, followed by 108 (35.9%) with a bachelor's degree (Table 1).

A large majority of participants (n=241, 80.1%) reported daily use of technology in their professional practice (Table II). Most demonstrated an intermediate level of proficiency with digital tools (n=187, 62.1%). WhatsApp was the most frequently used platform (n=135, 44.9%), followed by Facebook (n=52, 17.3%), while YouTube and Instagram were least utilized. Additionally, 179 (59.5%) participants reported daily engagement in digital professional networks. Participants exhibited varying levels of awareness regarding data privacy and

Table I: Demographic characteristics of the study participants

Variables		Frequency	Percentages
Age (years)	21-30	139	46.2
	31-40	129	42.9
	41-50	27	9.0
	51-60	5	1.7
	Above 60	1	0.3
Gender	Male	221	73.4
	Female	80	26.6
Cadre	Doctor	178	59.1
	Paramedic Staff	72	23.9
	Nursing	51	16.9
Working Experience	Less than 1 year	37	12.3
	1-5 years	90	29.9
	6-10 years	66	21.9
	11-15 years	74	24.6
	More than 15 years	34	11.3
Education	Diploma	30	10.0
	Bachelor's Degree	108	35.9
	Master's Degree	50	16.6
	Doctorate / Professional Degree	113	37.5

security regulations.

Domain 1: Anonymity: When asked if they identified themselves by name and profession on publicly accessible social media, 36.5% said they always did, and 35.9% reported that they usually doing so, reflecting the importance placed on transparency. More than half (57.1%) of the participants always exercised caution when posting personal information on professional platforms, with another 30.6% usually doing so. A total of 37.2% of participants always kept in mind that anonymous posts could be traced back to their source, while 35.5% usually did. This shows significant awareness of the risks of anonymity (Table III

Domain 2 Privacy settings: In terms of applying privacy settings, 53.8% of participants always applied strict settings on their social media profiles, and 28.2% usually did so. A smaller group (4.7%) never used such settings. Only 33.2% of participants always reviewed their privacy settings, while 30.2% did so usually. A considerable 25.6% reported sometimes or seldom reviewing these settings. More than half of the participants (36.2% usually and 35.2% always) were aware that privacy settings are imperfect and that any content posted online could be publicly accessible. About 39.9% of participants acknowledged that information posted online is difficult to remove completely, and 37.9% usually considered this before posting (Table III).

Domain 3: Maintaining boundaries: A diverse set of responses was seen when asked about patient queries via personal social media. While 31.6% said they sometimes entertained patient queries, 18.9% always avoided such interactions. About 37.5% of participants reported always avoiding personal contacts with patients on social media, such as accepting friend requests, and 25.2% usually avoided such interactions. A high majority (78.4%) of participants always respected patient privacy by not searching their social media profiles, demonstrating strong adherence to ethical standards (Table III).

Domain 4: Maintaining confidentiality: Most participants (78.1%) always refrained from posting masked or anonymized patient images on social media when consent could not be obtained. A total of 52.2% always refrained from discussing patient complaints or treatment on public social media sites, with 23.9% usually doing the same. More than one-third (37.5%) of participants always kept in mind that unnamed patients could still be identified through minimal information in online forums (Table III).

Domain 5: Conflict of interest: A total of 56.1% always specified that the opinions they expressed online were their own and did not reflect those of their employers, while 29.6% usually did so. Only 28.9% of participants always declared financial or commercial conflicts of interest when posting content online, while 22.6% never made such declarations. A total of 47.5% always refrained from promoting healthcare products based on personal experience, and 29.2% usually did so (Table III).

Domain 6: Accountability: More than half (57.1%) always ensured that the content they posted complied with copyright and defamation laws, while 24.6% usually adhered to these legal standards. About half (49.8 %) of the participants admitted that they acknowledge the original source while posting healthcare-related information and post evidence-based fact on their professional accounts. More than half (54.5%) always kept in view the legal implications of their online posts regarding patient care and management and 5.3 % didn't care about the Legal issues. Approximately one third (62.5 %) of the participants believe that whatever information regarding healthcare is shared by them represents the community as a whole and is trusted by people.

Domain 7: Respect for colleagues: Most (82.1%) treat their colleagues with respect and refrain to bully. Harass or post baseless comments on social

Table II: Assessment of social media app in terms of use, type, proficiency, engagement and awareness of privacy

Variables		Frequency	Percentages
Use in Professional Practice	Daily	241	80.1
	Weekly	26	8.6
	Monthly	11	3.7
	Rarely	21	7.0
	Never	2	0.7
Proficiency Level with Digital Tools	Beginner	21	7.0
	Intermediate	187	62.1
	Advanced	82	27.2
	Not Proficient	11	3.7
Social Media App Use	Facebook	52	17.3
	WhatsApp	135	44.9
	YouTube	29	9.6
	Twitter	6	2.0
	LinkedIn	7	2.3
	Instagram	5	1.7
	More than 1 App	67	22.3
Engaging in Digital Professional Networks	Daily	179	59.5
	Weekly	58	19.3
	Monthly	16	5.3
	Rarely	40	13.3
	Never	8	2.7
Awareness of Data Privacy	Neutral	63	20.9
	Somewhat aware	120	39.9
	Very Aware	93	30.9
	Somewhat Unaware	18	6.0
	Very Unaware	7	2.3

media. More than one third of the participants (69.8%) were of the opinion that negative comments on colleagues account will lead to negative reputation. Approximately 42.2 % responded that they inform their colleagues regarding unprofessional content shared by them and only 7% confessed that they didn't bother to inform their colleagues after seeing unprofessional content on their account.

Domain 8: Ethics: More than three fourth participants (77.1%) narrated that they are strictly professional never exploit them for personal and professional gains and only 4.3% response was "Never" to this question. Approximately two-thirds (63.5%) reported that they are able to identify and address breaches of privacy and confidentiality during online communication with patients, while only 3.3% were unable to recognize and resolve such issues. Just 1.7% of respondents never worry about patients' safety and trust while interacting with them online, compared to more than three-fourths (77.1%). Nearly 77.7% of participants indicated that they acknowledge and respect the racial and ethnic diversity of their colleagues and patients during online communication, whereas only a small minority, 2%, reported not considering this aspect (Table III). The mean score for digital professionalism was highest among doctors (116.96), followed by nursing staff (112.94) and paramedic staff (111.74). An ANOVA test was applied for comparison of d mean scores among the three professional groups, which revealed an F-value of 3.61 and a p-value of 0.02.

DISCUSSION

This study evaluated digital professionalism among healthcare professionals in Pakistan, including doctors, nurses, and paramedics, with a focus on social media use, privacy awareness, and online patient engagement. WhatsApp was the most frequently used platform for communication (n=135, 44.9%), followed by Facebook (n=52, 17.3%) and YouTube. These findings are consistent with previous studies highlighting the widespread use of these platforms in healthcare communication.[13,15-18] In contrast, global studies, such as Pershad Y, et al., have identified Twitter as the most widely used platform, reflecting regional variations in social media preferences. [19] A high level of digital professionalism was observed among participants, with 110 (36.5%) consistently identifying themselves by name and profession on public platforms, and 172 (57.1%) exercising caution when sharing personal information. These findings are in line with those of O'Connor S, et al., who reported increasing awareness of online professionalism among healthcare professionals.[20] Conversely, studies from the United States suggest a relatively more relaxed approach to online conduct, as described by Gagnon and Sabus, potentially reflecting differences in cultural and professional norms.[21] The study further demonstrated that 162 (53.8%)

Table III: Descriptive statistics of eight domains of scale for digital professionalism [n (%)]

Domain		Always	Usually	About half of time	Seldom	Never
Self-Anonymity	I identify myself by name and profession on publicly accessible social media sites and networks.	110 (36.5)	108 (35.9)	21 (7.0)	33 (11.0)	29 (9.6)
	I am cautious when posting my personal information on professional social media platforms.	172 (57.1)	92 (30.6)	16 (5.3)	8 (2.7)	13 (4.3)
	I bear in mind that any post uploaded anonymously can, in many cases be traced back to its source or point of origin.	112 (37.2)	107 (35.5)	20 (6.6)	42 (14.0)	20 (6.6)
Privacy settings	I apply conservative/strict privacy settings and carefully select the intended audience on my personal social media profile.	162 (53.8)	85 (28.2)	12 (4.0)	28 (9.3)	12 (4.0)
	I regularly review the privacy settings of my personal and professional social media profiles.	100 (33.2)	91 (30.2)	20 (6.6)	77 (25.6)	13 (4.3)
	I keep in mind that the privacy settings are imperfect and any content posted online is public and widely accessible.	106 (35.2)	109 (36.2)	27 (9.0)	44 (14.6)	15 (5.0)
	I bear in mind that once the information is posted online, it is difficult to remove it completely as users may distribute it further or comment on it.	120 (39.9)	114 (37.9)	15 (5.0)	37 (12.3)	15 (5.0)
Maintaining boundaries	I do not entertain my patient's queries about healthcare if they access me through my private/personal social media profile.	57 (18.9)	58 (19.3)	35 (11.6)	95 (31.6)	56 (18.6)
	I avoid establishing online personal contacts with my patients like accepting friend requests.	113 (37.5)	76 (25.2)	26 (8.6)	49 (16.3)	37 (12.3)
	I respect the privacy of my patients and do not search their social media profiles.	2 (78.4)	32 (10.6)	6 (2.0)	10 (3.3)	17 (5.6)
Maintaining confidentiality	I avoid posting masked/unidentifiable/anonymized images of my patients on social media sites when informed consent of patients could not be obtained.	235 (78.1)	27 (9.0)	13 (4.3)	9 (3.0)	17 (5.6)
	I refrain from discussing my patient's complaints and treatment with colleagues on publicly accessible social media sites.	157 (52.2)	72 (23.9)	19 (6.3)	27 (9.0)	26 (8.6)
	I keep in mind that an unnamed patient may be identifiable through minimal information even in a private online forum.	113 (37.5)	97 (32.2)	31 (10.3)	42 (14.0)	18 (6.0)
Conflict of interest	I specify that the opinions I express online are my own and do not reflect another employer, colleague, or institute.	169 (56.1)	89 (29.6)	15 (5.0)	16 (5.3)	12 (4.0)
	I declare any financial or commercial conflict of interest when posting content online (health care organizations, pharmaceutical, and biomedical companies	87 (28.9)	90 (29.9)	20 (6.6)	36 (12.0)	68 (22.6)
	I refrain from endorsing and promoting healthcare products and events on social media sites based on my personal experience.	143 (47.5)	88 (29.2)	15 (5.0)	30 (10.0)	25 (8.3)
Accountability	I keep in mind that the content I post online is subject to the same laws of copyright and defamation as written or verbal communication.	172 (57.1)	74 (24.6)	22 (7.3)	17 (5.6)	16 (5.3)
	I acknowledge the original source while posting healthcare-related information and post evidence-based facts on my professional accounts.	150 (49.8)	68 (22.5)	44 (14.6)	23 (7.6)	16 (5.3)
	I keep in view the legal implications (defamation, cyber bullying, privacy lawsuits, copyright breach) of my online posts regarding patient care and management.	164 (54.5)	91 (30.2)	14 (4.7)	24 (8.0)	8 (2.7)
	I keep in mind that any information I share online as a healthcare professional represents the medical profession at large and is trusted by the public.	188 (62.5)	71 (23.6)	12 (4.0)	24 (8.0)	6 (2.0)

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Domain		Always	Usually	About half of time	Seldom	Never
Respect for colleagues	I treat my colleagues with respect and do not bully, harass, or post baseless comments about them on social media forums and blogs.	247 (82.1)	29 (9.6)	12 (4.0)	8 (2.7)	5 (1.7)
	I keep in mind that my comments on my colleague's content can negatively affect their reputation.	210 (69.8)	46 (15.3)	2 (7.0)	12 (4.0)	21 (7.0)
	If I see unprofessional content posted by my colleague, I feel responsible to bring it to the attention of that Person.	127 (42.2)	102 (33.9)	17 (5.6)	34 (11.3)	21 (7.0)
	I keep my relationship with patients strictly professional and do not exploit them for any personal or financial gains.	232 (77.1)	45 (15.0)	5 (1.7)	6 (2.0)	13 (4.3)
Ethics	I recognize and resolve ethical issues (e.g., breach of privacy, confidentiality & trust, relationship abuse) encountered during online communication with patients.	191 (63.5)	69 (22.9)	10 (3.3)	21 (7.0)	10 (3.3)
	I take care of patient safety and trust while giving medical advice during online interactions.	232 (77.1)	48 (15.9)	9 (3.0)	7 (2.3)	5 (1.7)
	I respect the diversity (ethnicity & racial differences) of my patients and colleagues during online interaction.	234 (77.7)	48 (15.9)	6 (2.0)	7 (2.3)	6 (2.0)

Table IV: Comparison of mean scores by occupation on digital professionalism instrument

Occupation	Frequency	Mean Score	F-Value	p-value
Doctor	178	116.96	3.61	0.02*
Nursing	51	112.94		
Paramedic Staff	72	111.74		

*: significant p value

participants applied strict privacy settings on their social media profiles, consistent with findings from other developing countries reported by Imran and Jawaid.[22] In contrast, Long X, et al., observed lower levels of privacy awareness among healthcare professionals in China.[23] The relatively higher awareness in this study may reflect increasing concern about data breaches and privacy violations as digital platforms become more integrated into healthcare practice. In addition, 100 (33.2%) participants reported regularly reviewing their privacy settings, indicating a level of vigilance that may exceed that reported in some Western settings, where such practices are often overlooked.[9] This heightened awareness may be influenced by evolving regulatory frameworks and increased emphasis on digital ethics within the local context. Patient interaction via social media was reported by 95 (31.6%) participants, a proportion higher than that observed in many Western studies, where such interactions are generally discouraged.[7] This pattern may reflect the reliance on social media for communication in resource-limited settings; however, it raises important concerns regarding confidentiality and professional boundaries, as highlighted by Mostaghimi and Crotty.[3] Digital professionalism scores varied across professional groups, with doctors demonstrating the highest mean score (116.96), followed by nursing staff (112.94) and paramedics (111.74). This finding is consistent with previous research by O'Connor S, et al., suggesting that physicians often receive more formal training in ethics and professionalism.[20] The significant intergroup difference ($p=0.02$) suggests variability in exposure to digital professionalism training across professional groups. Higher scores among doctors may reflect greater emphasis on ethics and professionalism during medical education, whereas nurses and paramedical staff may have comparatively fewer opportunities for structured training in this area.[24]

Similar trends have been reported by Mather and Cummings, who highlighted gaps in digital literacy and professionalism training among nurses and allied health professionals.[25] Nonetheless, the relatively small differences in scores suggest a growing awareness of digital professionalism across all healthcare roles.

Legal awareness was also notable, with 172 (57.1%) participants reporting that they frequently consider issues such as defamation and copyright when posting online. This level of awareness appears higher than that reported in other settings, where such considerations are often overlooked.[11] The increased awareness observed in this study may reflect emerging regulatory emphasis and heightened concern regarding the legal implications of online behavior, particularly in relation to patient privacy and professional accountability.[3]

Limitations of the study

The study has several limitations. First,

the sample was drawn from a limited geographic area in Pakistan, which may restrict the generalizability of the findings to other regions or countries. Second, the use of self-reported data may introduce response bias. Third, the cross-sectional design precludes causal inference. Future research should include larger and more diverse samples across multiple regions and healthcare settings to enhance generalizability. Longitudinal or mixed-methods approaches are recommended to better explore causal relationships and provide deeper insights into digital professionalism. Additionally, the use of objective assessment methods, such as peer evaluations or digital audits, may help minimize self-report bias.

CONCLUSION

Overall, a notable degree of digital professionalism has been exhibited by healthcare professionals in Pakistan, in terms of awareness of legal implications and maintenance of privacy settings. Doctors showed greatest score on digital professionalism instrument, probably due to their extensive training. Nonetheless, intermittent communication with patients through personal social media channels and inconsistent disclosure of financial conflicts of interest highlight areas for improvement. These findings emphasize the need for tailored training and institutional strategies to promote responsible and ethically sound digital engagement across all healthcare professions.

ACKNOWLEDGEMENT

The authors acknowledge the administrators of hospitals for facilitating data collection and the participants for their valuable time and contribution to this study.

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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

IA & HA: Conception and study design, acquisition, analysis and interpretation of data, drafting the manuscript, critical review, approval of the final version to be published

FI: Analysis and interpretation of data, drafting the manuscript, approval of the final version to be published

AK: Acquisition, analysis and interpretation of data, drafting the manuscript, approval of the final version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

Authors declared no conflict of interest, whether financial or otherwise, that could influence the integrity, objectivity, or validity of their research work.

GRANT SUPPORT AND FINANCIAL DISCLOSURE

Authors declared no specific grant for this research from any funding agency in the public, commercial or non-profit sectors.

DATA SHARING STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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