



LITERATURE REVIEW: THE RELATIONSHIP BETWEEN SMARTPHONE USE AND INCIDENTS OF ANXIETY (NOMOPHOBIA) AMONG ADOLESCENTS IN INDONESIA

Tinjauan Literatur: Hubungan Antara Penggunaan Smartphone dan Kejadian Kecemasan (Nomophobia) pada Remaja di Indonesia

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ABSTRACT

Background: Smartphones were an information and communication technology that could not be separated from human life. High-intensity use of smartphones led to addiction. Dependence on smartphones could lead to anxiety disorders or so-called nomophobia. **Purpose:** To determine the relationship between smartphone, use and the incidence of anxiety (nomophobia) in adolescents in Indonesia. **Methods:** The literature review used national articles published in 2019-2024. Articles were searched using the Preferred Reporting Items for Systematic Reviews & Meta-Analyses (PRISMA) method. Inclusion criteria include articles with quantitative research, as well as mixed methods with research subjects on adolescents in Indonesia. A total of eleven articles were included. This research used national standard articles with an article search database, namely Google Scholar and Garuda. **Results:** Based on the eleven articles analysed, there is a relationship between anxiety disorders (nomophobia) in adolescents in Indonesia and the intensity of their use. **Conclusion:** The high use of smartphones is associated with a higher tendency of nomophobia. High intensity of smartphone use is influenced by several factors, including various interesting features of smartphones, one of which is social media, the COVID-19 pandemic, and the feeling of not wanting to be left behind by trends among teenagers.

Keywords: anxiety, nomophobia, smartphone addiction, teenager

ABSTRAK

Latar belakang: Smartphone merupakan salah satu teknologi informasi dan komunikasi yang tidak bisa terlepas dari kehidupan manusia. Penggunaan smartphone dengan intensitas tinggi menyebabkan ketergantungan. Ketergantungan pada smartphone dapat menyebabkan timbulnya gangguan kecemasan atau yang disebut Nomophobia. **Tujuan:** Untuk mengetahui hubungan penggunaan smartphone terhadap kejadian kecemasan (Nomophobia) pada remaja di Indonesia. **Metode:** Penelitian studi literatur menggunakan artikel nasional tahun terbit 2019-2024. Pencarian artikel dilakukan menggunakan metode Preferred Reporting Items for Systematic Review & Meta-Analyses (PRISMA). Kriteria inklusi meliputi artikel dengan penelitian kuantitatif, serta mix methods dengan subjek penelitian pada remaja di Indonesia. Sebanyak sebelas artikel yang masuk kedalam kriteria. Penelitian ini menggunakan artikel berstandar nasional dengan database pencarian artikel yaitu Google Scholar dan Garuda. **Hasil:** Berdasarkan sebelas artikel yang dianalisis, terdapat hubungan antara gangguan kecemasan (Nomophobia) pada remaja di Indonesia dengan intensitas penggunaannya. **Kesimpulan:** Tingginya penggunaan smartphone dipengaruhi oleh beberapa faktor, antara lain macam-macam fitur yang menarik pada smartphone salah satunya yaitu media sosial, adanya pandemi COVID-19, dan perasaan tidak ingin ketinggalan tren di kalangan remaja.

Kata kunci: kecemasan, kecanduan smartphone, nomophobia, remaja

INTRODUCTION

The impact of globalisation today cannot be separated from human life. One of them is the development of information and communication technology in the use of devices known as smartphones. The ease of communication provided by smartphones continues to grow among users, including teenagers.

The Central Statistics Agency (2020) states that the use of smartphones in Indonesia is 34.63%, dominated by the group of teenagers aged 13-19 years (Hamdi & Gautama, 2024). The E-marketer market research institute estimated that in 2018 there will be more than 100 million teenagers aged 15-19 years, who have the highest penetration of using the internet via smartphone, namely 91% (Sutisna & Tohri, 2023). According to data from the 2018 Indonesian Internet Service Providers Association (APJII) survey based on education level, 80% of internet users are middle school (SMP) and high school (SMA) students aged 13-19 years, which is classified as teenagers. Apart from this, the average Indonesian population uses the internet for 8 hours and 36 minutes every day (Hamdi & Gautama, 2024).

The two data points above illustrate that smartphone users with internet services are currently dominated by the teenage age group, who happen to be working as students. The use of smartphones by students has both positive and negative effects. According to research (Taopan *et al.*, 2019), the positive impact of the use of smartphones for students is that it helps in the learning process, makes it easier to communicate with friends or family, and helps in getting all the information. The increasing number of smartphone users among teenagers does not always have a positive impact on them (Nurningtyas & Ayriza, 2021).

Some negative effects are mostly caused by a very high intensity of use and a lack of understanding of how to use smartphones. This could potentially lead to disruptions in social interactions, which could have an impact on the individual themselves. Using smartphones in everyday life has become a habit, but excessive use of smartphones is something that is very bad and has a negative impact on life (Hamdi & Gautama, 2024).

One of the negative effects of smartphone use that is not followed by understanding and control is the emergence of a psychological disorder known as nomophobia (no mobile phone phobia). Specifically, this phobia (fear) is excessive anxiety when away from a smartphone or gadget (Yildirim & Correia 2014) in (Hamdi & Gautama, 2024). Based on a study by (Sitanggang *et al.*, 2023), smartphone users among teenagers in Martapura 1 Vocational High School may suffer from nomophobia disorder.

Nomophobia promotes the development of mental disorders, personality disorders, as well as problems with self-esteem, loneliness and happiness in young people (Ahmed *et al.*, 2019). In addition, nomophobia can be associated with physical symptoms such as excessive sweating, seizures, digestive problems and panic attacks. Therefore, nomophobia has been included in the DSM-V by considering the level of stress, anxiety and tension involved (Sezer & Atilgan, 2019).

The prevalence of people with nomophobia in Indonesia has increased significantly, in 2013 it was around 75% with an age range of 16-19 years (Mahendra *et al.*, 2013) in (Mudrikah, 2019). In 2014, around 84% of nomophobic individuals were in the 19-24 age group. From a gender and age perspective, the findings show that nomophobia in females is around 56%

compared to 47% in males and in the age range of 18-24 years (Mayangsari, 2014) in (Prasetyo & Ariana, 2016).

Nomophobic behaviour can reinforce tendencies of social anxiety and dependence on smartphone use, causing stress (Fadhilah *et al.*, 2021). Apart from this, nomophobia is also a result of fear of loneliness, which causes someone to use smartphones excessively to communicate and obtain information (Rahyuningrum & Sary, 2019). In a previous study conducted by (Haerani, 2023) in Jawilan 1 Junior High School Serang, 62 respondents (72.1%) experienced mental disorders due to excessive use of smartphones.

Another study in Indonesia showed that as many as 61.6% of a 13-year-old teenager at Budi Cendikia Islamic School Depok experienced this high level of anxiety associated with using smartphone, thus resulting in teenagers having social problems in the society (Supartini *et al.*, 2021). This will make a person withdraw from their social environment. In addition, anxiety can affect quality of life and prevent adolescents from interacting socially or participating in daily activities. This shows the importance of caring for mental health to support the productivity and quality of physical health of adolescents (Perbowosari *et al.*, 2020).

Based on the above description of the problem, the research is interested in further analysing the anxiety caused by prolonged use of smartphones. The novelty or the latest of the research titled "The Relationship between Smartphone Use and Anxiety (Nomophobia) Among Adolescents in Indonesia" lies in the focus of the research which wants to explore the anxiety caused by long-term use of smartphones. Thus, this research can provide an overview of anxiety as measured by the NMP-Q (Nomophobia Questionnaire) (Yildirim & Correia, 2015).

Given the urgency, efforts must be made to prevent nomophobia because of smartphone addiction. Previous research found an association between smartphone use and anxiety disorders (nomophobia), but not much has specifically studied at-risk adolescents aged 13-19 years with anxiety (nomophobia). Therefore, it is hoped that this research can make an important contribution to understanding the incidence of nomophobia in relation to long-term smartphone use and provide appropriate recommendations for overcoming nomophobia.

This study aimed to understand and share the prevalence, risk factors and mental health impact of these conditions, such as anxiety caused by smartphone addiction. The aim of this article also included the development of more accurate measurement tools to assess levels of nomophobia, such as the Nomophobia Questionnaire (NMP-Q), which measures aspects such as the fear of losing connectivity and the inability to communicate when away from the smartphone.

METHOD

Literature Search Strategy

This research was designed using the literature review method through the PECO(S) framework. The articles were retrieved using Google Scholar and Garuda databases. To facilitate the authors to find articles that meet the research objectives, the selection of articles in this literature review study was determined by inclusion criteria, which include articles published in national journals, articles that can provide an overview of nomophobia among adolescents aged 13-19 in Indonesia, including types of quantitative research, mixed methods, as well as articles published from 2019-2024, open access, and in Indonesian. Exclusion criteria consist of articles that do not meet the

population, exposure, comparison, outcome, and study design criteria or what is known as PECO(S), international standard articles, and articles that are not full text or not accessible.

Data Collection and Analysis

Collection of articles were using inclusion and exclusion criteria with searches using Boolean operators, namely "smartphone use" AND "adolescents", AND "smartphone addiction", "social anxiety" AND "nomophobia", "anxiety disorders" OR "nomophobia", "smartphone addiction" OR "smartphone addiction", "smartphone use" OR "gadget" OR "device".

Eligibility criteria based on PECO(S) are: (1) population: adolescents in Indonesia, (2) exposure: duration of smartphone use, (3) outcome: incidence of anxiety (nomophobia) in adolescents in Indonesia, (4) comparison: Low smartphone use compared with high smartphone use, (5) Outcome: The incidence of nomophobia, which can be measured by the Nomophobia Questionnaire (NMP-Q), (4) Study design: quantitative and qualitative. After the articles were collected, the research was filtered using the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) method. Finally, the performance used is processed by content analysis.

Search for articles based on keywords. A total of 238 national articles were found with 150 searches based on article titles that matched the research objectives. In addition, 88 articles were found based on the

last 5 years 2019-2024. The author selected articles for eligibility based on inclusion and exclusion criteria and found 21 articles, as well as 11 articles that were eligible and read in full on Google Scholar and Garuda. The following is a flowchart of the data search according to the PRISMA method.

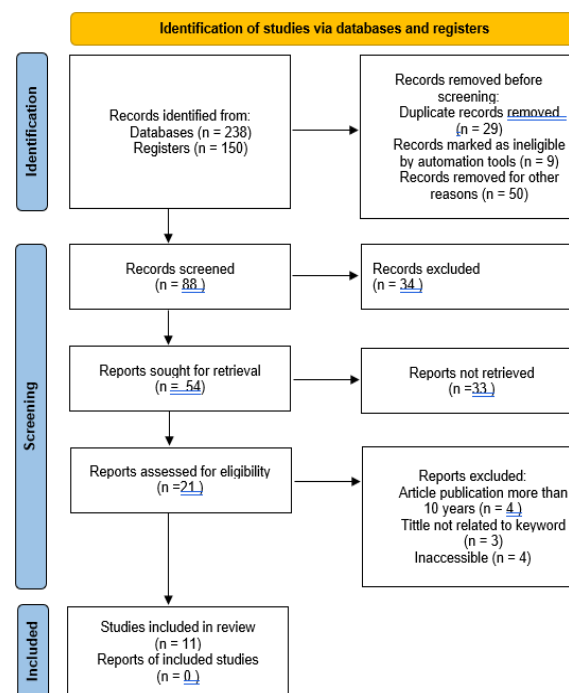


Figure 1. Diagram Flow Preferred Reporting Items for Systematic Reviews & Meta-Analyses method (PRISMA)

RESULT

Based on the results of searching for articles using the PRISMA method, 11 articles were obtained using Google Scholar and Garuda with a range of publication years in the last five years, namely 2019-2024.

Table 1. Article search result

Title	Authors	Year	Research Method	Result
Study on the level of anxiety (nomophobia) of teenagers regarding mobile phones in Padang City Public High School	Dwi Christina Rahayuningrum, Annisa Novita Sary	2019	Type of research: Quantitative analytical Sample: 75 people Analysis technique: Chi-Square	This study revealed that there is a relationship between the level of anxiety about no-mobilephone (nomophobia) in Padang City State High School and (p-value=0.000). As many as 53% of adolescents experience moderate levels of anxiety and 46% of adolescents experience moderate levels of nomophobia

Continuation of Table 1. Article search result

Title	Authors	Year	Research Method	Result
Identification of Nomophobic Tendencies in Students of Pangalengan Bandung 1 Senior High School	Deni Sutisna, Dyah Indraswati	2020	Type of research: Quantitative descriptive Sample: 117 students Analysis technique: Chi-Square	As many as 48% of students were identified as severely nomophobic, describing themselves as unhappy when they were far away from their mobile phone or when they missed it. There is no difference in levels of nomophobia between males and females aged 16-17. So there is a link between excessive smartphone use and the tendency to be nomophobic.
Study on teenagers' fear of mobile phone phobia (nomophobia) at Kuantan Mudik Lubuk Jambi 1 Senior High School	Alini, Langen Nidhana Meisyalla, Bri Novrika	2022	Type of research: Analytical descriptive Sample: 162 students Analysis technique: Univariate	This study revealed that most of the respondents (80.9%) were female and most of the respondents (52.5%) were 16 years old. Apart from that, the online media that students frequently visit is social media with a usage duration of >4 hours. Univariate test results showed that some respondents (42%) experienced moderate nomophobia, so there was a positive and significant correlation between the intensity of smartphone use and nomophobia.
The Relationship between the Duration of Gadget Use and Adolescents Anxiety in RW 03 Siteaeur, Bojongloa Kidul District, Bandung	Linda Hotmaida, Tri Ardayani, Hengki Toberman Zandroto	2022	Type of research: Quantitative with a cross sectional Sample: 76 people Analysis technique: Bivariate analysis with Chi-Square	It examined that there was a relationship between the duration of gadget use and anxiety among adolescents in RW 03 situsaeur, Bojongloa Kidul District. A total of 61 people (80.3%) used gadgets for a long time and the majority of respondents experienced severe anxiety, namely 43 people (56.6%).
The Relationship between Smartphone Dependence and Nomophobia in Adolescents at Bogor City 1 (Islamic) Senior High School in 2022	Gianika Salsa Raharja, Agus Sumarno	2022	Type of research: Descriptive correlation Sample: 151 respondents Analysis technique: Univariate and bivariate analysis using Chi-Square	Based on the results of the analysis, p-value of $0.000 < 0.005$ was obtained, which means that there was a relationship between smartphone dependence and nomophobia among adolescents in Bogor City 1 (Islamic) Senior High School of 74%. As many as 84 students (55.6%) experienced heavy smartphone dependence and as many as 66 students (43.7%) experienced severe nomophobia.
The Relationship between Smartphone Addiction among Adolescents at Padang City 3 Senior High School	Irma, Yovita	2022	Type of research: Descriptive analytic with a cross-sectional approach Sample: 255 respondents Analysis technique: Chi-Square	Based on the results of the analysis, p-value was < 0.005 , so there was a relationship between smartphone addiction and nomophobia. As many as (78.8%) students experienced addiction with a moderate level of nomophobia (58.4%).
The Relationship of (Smartphone Addiction) to Nomophobia at Nawangan Pacitan 1 Senior High School	Comsiana, Wahyu Nur, Wahyuni, Nurul Sri, Sulisty	2023	Type of research: Research Type: Quantitative Sample: 54 students Analysis technique: Chi-Square	Based on the analysis results, p-value of $0.002 < 0.005$ was obtained, which means there was a relationship between smartphone addiction and nomophobia at Nawangan Pacitan 1 Senior High School. As many as 47 people (87%) experienced smartphone addiction in the low category and as many as 48 people (88.9%) experienced nomophobia in the low category.

Continuation of Table 1. Article search result

Title	Authors	Year of Publication	Research Method	Result
The Relationship Between Device Use and Nomophobia in Class 11 Social-Science Students at Singaraja 4 Senior High School	Komang Mia, Meliani, Yogi Triana, Ni Made Ari Sukamandari	2023	Type of research: Descriptive analytics with a cross-sectional approach Sample: 82 respondents Analysis technique: Univariate and bivariate analysis with Spearman rank test	The results of the study concluded that there was a relationship between the use of gadgets and nomophobia in class 11 social-science students at Singaraja 4 Senior High School with a p-value = 0.002 (p<0.05). Based on gender, female have a higher dependency score than male, as many as 69 people (84.1%) were aged 16-17 years and as many as 35 people (42.7%) experienced nomophobia in the high category.
Anxiety Levels of Adolescents who Uses Smartphones at Martapura 1 Vocational High School, Banjar Regency	Yohana A Sitanggang, Nor Halimah	2023	Type of research: Quantitative descriptive Sample: 92 people Analysis technique: Chi-Square	Based on the research results, there was a relationship between anxiety and smartphone use among teenagers at Martapura 1 Vocational High School. Most of the respondents which were adolescents aged 15-16 years were 63 people (68%). Female respondents were 59 people (64.1%) and the duration of using smartphones daily was >8 hours, namely 35 people (38%). As a results of the long duration of smartphone use, 70 adolescents (76.1%) experienced anxiety in the moderate category.
Nomophobia Among Students Using Smartphones at Gumanti Valley 1 Senior High School	Musbirul Hamdi, Mohammad Isa Gautama	2024	Type of research: Qualitative Sample: 6 people Analysis technique: Data reduction, data presentation, and drawing/cheking conclusion	The main finding in this research was that 90% of Lembah Gumanti 1 Senior High School. A total of 6 people aged 17 years were categorized as suffering from nomophobia and were also categorized as excessive smartphone users. Apart from that, the online media that was often visited by students was mobile legends (30%) with a usage time of 9-13 hours per day. It can be concluded that students who were categorized as nomophobia sufferers have a high sense of anxiety if the student does not have direct contact with a smartphone
The Relationship between Smartphone Addiction Tendencies and Nomophobia in Adolescents at Bekasi City (X) Senior High School	Effie Dwi Aryanti, Netty Merdia	2024	Type of research: Quantitative Sample: 122 people Analysis technique: Person correlation	There was a positive and significant correlation (p-value 0.000<0.005) between smartphone addiction and nomophobia in young students at Harapan 1 Senior High School. As many as 75 students (61.47%) had a tendency towards addiction in the moderate category and as many as 79 students (64.75%) experienced nomophobia in the moderate category. It can be concluded that the higher the level of smartphone addiction, the higher the nomophobia and vice versa.

DISCUSSION

Based on eleven studies that have been reviewed, a relationship was found between smartphone use and the incidence of

the high duration of smartphone use. It caused the features and application in smartphone, especially social media. This condition resulted in the tendency of

nomophobia which can disrupt adolescents' lives and disrupt social relations when interacting with other people, they were preoccupied with their smartphones rather than having to interact with the person they were talking to (Wati, 2019). The use of smartphones has spreading out. Hence, some people have irrational anxiety about not using a smartphone and were starting to try to eliminate the possibility of not being able to use the smartphone (Yildirim, 2014) in (Wati, 2019).

Based on research results, it was stated that adolescents aged 15-18 years spent an average of 1-7 hours per day using smartphones such as accessing social media, browsing the internet and online shops (Sugianto, 2018). Based on (Lape *et al.*, 2021), smartphone use lasts 5-6 hours per day. Research on teenagers in Muara Bahan village, Singingi Hilir District, Kuansing showed that the average teenager spent around 5-9 hours, even almost 24 hours, using smartphones more than 3 times a day, which can lead to addiction to using smartphones, resulting in anxiety (nomophobia) (Muliasari, 2019.)

Smartphone addiction was experienced by many adolescent girls. They have a higher dependency score on smartphones than boys. This was in line with research conducted by (Meliani *et al.*, 2023.) which stated that as many as 69 people (84.1%) had a high level of dependence on smartphones. Adolescent girls were more likely to use smartphones to relieve negative emotions after experiencing stressful life events (Rahmadani & Mandagi, 2021).

The high level of nomophobia in women can be influenced by hormonal factors that differentiate women from men, where hormonal factors play a role in determining mood and behavior (Auliyah *et al.*, 2022) This is in line with research conducted by Woran *et al.*, (2020) that

adolescent girls were more interested in interacting via social media. It was due to the desire to share stories via social media such as making statuses on WhatsApp, Twitter or Instagram compared to socializing with their friends.

However, there were several studies which argued that there were no gender differences in the incidence of anxiety (nomophobia) (Sutisna & Indraswati, 2020). Research of (Syahputra & Erwinda, 2020) also stated that there was insignificant difference between the nomophobia tendencies of adolescent boys and girls with a p-value >0.005 because both female and male individuals have a lot of internet and social media access. This both increases the individual's tendency to have nomophobia (Purbowosari *et al.*, 2020).

Based on Muliasari (2019), adolescents aged 13-19 years considered smartphones as objects that were attractive in design and have similar functions to computers. In addition, smartphones provide ease in communicating, making smartphones a lifestyle supporter and entertainment medium. Thus, smartphones are very important to become a daily necessity. Individuals who did not have a smartphone would join with his/her friend, so he/she did not get left behind. This is the reason why adolescents get anxious if they do not use smartphones.

Other research revealed that there was a significant relationship between excessive smartphone use and the incidence of anxiety (nomophobia) in Padang City State High School students. Students experienced nomophobia in the moderate to severe category. Anxiety that students feel when they are unable to use their smartphones for communication is one of the contributing elements. When missing information on social media and when they are engaged in activities without their smartphones, students

suffering from moderate to severe nomophobia will experience anxiety (Rahayuningrum & Sary, 2019).

The increase in smartphone uses also occurred during COVID-19 pandemic. Based on Larasati and Lestari (2021), 27 adolescents (38%) spent time using smartphones in Puluhan Tengah Village. This was in line with research conducted by (Aryanti & Merdiaty, 2024) which stated that students who have a high intensity of smartphone use have a higher level of anxiety experienced when they did not have access to a smartphone. During COVID-19 pandemic, all activities were conducted without face-to-face contact and took over at home, school, workplace, etc.

Similar research also examined that during the COVID-19 pandemic, there was an increase in smartphone use in Indonesia by 76.4%. The biggest use of smartphones outside of learning was playing games, using social media, and opening e-commerce. This condition caused many adolescents to experience high levels of anxiety (Al Faridzi *et al.*, 2022).

The increasing use of smartphones and the emergence of nomophobia in adolescents require control efforts to be taken. There is a need to limit the use of smartphones rather than ban it. It was due to people cannot be separated from technological advances. One thing that can be applied is to limit the use of smartphones by doing reality therapy.

Reality therapy is a person who is advised to focus on behavior such as gardening, painting, etc. People do activities other than using a smartphone (Bhattacharya *et al.*, 2019). This aims to avoid addiction to using smartphones, stress, and nomophobia.

Eleven articles revealed differences in measuring nomophobia and smartphone use among adolescents. The NMP-Q

(Nomophobia Questionnaire) used to measure nomophobia. However, gender, education level, age and environmental conditions also influence the strength and weakness of the relationship between smartphone use and anxiety disorders (nomophobia). This research also has limitations because it only uses Google Scholar and Garuda databases as sources for the articles reviewed. The research design used was cross sectional.

Based on the literature review that has been carried out, it showed that uncontrolled use of smartphones can cause anxiety (nomophobia) in teenagers. The implications that can be used from this research can be used as a reference for readers regarding the relationship between smartphone use and the incidence of anxiety (nomophobia) in adolescents in Indonesia. Research results and research weaknesses can be used as a reference to produce better research.

CONCLUSION AND SUGGESTION

Based on the results of the literature study presented above, it can be concluded that current technological advances, especially smartphones, apart from bringing benefits to life, have a negative impact on adolescents, such as nomophobia. Adolescents aged 13-19 years were able to learn new technology quickly. However, adolescents tend to lack good control over their behavior. It makes them more vulnerable to experiencing nomophobia. The higher the use of smartphones, the higher the potential for nomophobic tendencies experienced. The high use of smartphones is influenced by several factors, including various interesting features on smartphones. One of them is social media. Moreover, the COVID-19 pandemic made people more addicted to smartphones. It made people afraid of missing out on trends among teenagers. This has an unfavorable impact on

adolescents, such as a lack of direct communication, being more apathetic to the conditions around them, and being individualistic or feeling like they do not really need other people.

Research related to nomophobia is very important to raise awareness that the effectiveness of sophisticated smartphone use also has a negative impact. However, there is a lack of research on nomophobia. Hopefully, there is another research in different eras to determine the level of nomophobia from time to time.

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AUTHOR CONTRIBUTION

Ayun Zul Silmi contributed to data collection, data analysis, manuscript writing, literature review, and reference. Syifa'ul Lailiyah contributed to study design, data collection and supervision, data analysis, and manuscript revision.

CONFLICT OF INTEREST

The authors have no conflict of interest.

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