

# NO MOBILE PHONE phOBIA among young Italian nurses during the COVID-19 pandemic: a cohort observational study based on gender, age, work experience and shiftwork

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**Summary.** *Aim.* To investigate nomophobia levels in young Italian nurses and any differences based on socio-demographic variables, such as: gender, age, years of work experience and shiftwork. *Methods.* A cohort observational study was conducted from August to September 2021. Nurses were recruited through Facebook and Instagram nursing pages. Data focused on: gender, age, years of work experience, shifts and nomophobia condition and its relating sub-dimensions, according to the "Nomophobia questionnaire". *Results.* A total of 156 Italian nurses were enrolled. Nobody among the participants reported the absence of nomophobia; 49.40% reported mild levels, 41.70% moderate levels and 9.00% severe levels. Additionally, these findings detailed a more specific image of the nomophobic nurse as: female, aged less than 25 and worked less 1 year, regardless of the shift. *Conclusions.* There is an urgent need for the nursing community and educational bodies to introduce a more judicious use of smartphones by professionals.

**Keywords.** Gender, nomophobia, nurse, youth.

## Introduction

Nomophobia stands for 'NO MOBILE PHONE phOBIA'.<sup>1</sup> It was recognized as a psychological condition in subjects who have a fear of being detached from mobile phone connectivity.<sup>1,2</sup> However, the term 'phobia' is also related to an anxiety disorder.<sup>3</sup> The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) identified the term nomophobia as a "phobia for a specific thing".<sup>4</sup> When a subject overuses their mobile phone, several psychological elements are implicated, such as low self-esteem or an extrovert character.

Today, the progress of technology culminated in smartphones being transformed in vital instruments in people's daily lives. A smartphone supplies information to everyone, anytime and anywhere. Information and communication do not depend on distance, and with a single 'click' everyone is reachable. In the Italian scenario, according to the survey carried out by the National Institute of Statistics in 2015, 54% of Italian families had a smartphone in 2014, with an increasing trend compared to 2013.<sup>5</sup> Therefore, by becoming essential, smartphones are increasingly affecting every-

one's life. In fact, the evidence on the management of the technologies used to communicate and collect information, especially smartphones and mobile phones, testify of a radical diffusion all around the globe. In 2015, in the US, two thirds of Americans had a mobile phone, with a growing trend in its use.<sup>6</sup> In addition, in 2016, in South Korea the overall rate of smartphone usage was about 90% in the general population and 99% among people aged 20-30.<sup>7</sup> Both in Portugal and Spain, it was assessed that 89% of the Portugal population has a mobile phone and 77% of them use the internet<sup>8</sup> and that 97.1% of young Spanish had a mobile phone and 90.4% of teenagers use their mobile phone to access the internet. Additionally, all these communication advances captivate adolescents and young people, who spend a lot of their time managing their mobile phones by creating the so-called 'cyber spaces',<sup>9</sup> as a 'virtual dimension' where individuals can communicate all their emotions in the different social contexts, from family and friends to their work environment too.<sup>10</sup> Therefore, mobile devices can induce tolerance, by stimulating the user to feel more satisfied while using them.<sup>11</sup> Additionally, an excessive use of the smartphone may be considered as a form of 'addiction'<sup>8</sup> associated with anxiety and depression conditions, as well as recognized as a 'smartphone dependence'.<sup>12,13</sup> Therefore, in young people the invasiveness and effectiveness of smartphones have originated negative behaviors that could be recognized as compulsive, such as: continuously checking the smartphone for messages or calls or for internet connection availability; keeping the phone on all the day; never losing sight of it; using the phone when interacting with another person, who is then ignored (phubbing);<sup>14</sup> believing to have heard the phone ring, which provokes anxiety (ringxiety)<sup>10,15</sup>. All these factors determine 'nomophobia', a term which describes the fear of feeling or remaining disconnected, with a consequent anxiety and distress due to the loss of the network or the fact that the device lost its charge.<sup>4,15,16</sup> In this regard, Bragazzi and Del Puente<sup>4</sup> defined the nomophobic attitude as "anxiousness to be disconnected or to have low battery". Therefore, nomophobic individuals always check their screens to verify their virtual social relations. Ad-

ditionally, Yildirim and Correia<sup>16</sup> identified four sub-dimensions of the nomophobia disorder: not being able to communicate; losing connectedness; not being able to access information; and giving up convenience. Moreover, the lockdown due to the COVID-19 pandemic negatively impacted this scenario. In fact, social distancing was meant to reduce the risk of infection while, at the same time, technology became essential for academic and professional training and smart working. Therefore, all the general population's behaviors increased the use of smartphones and the consequent dependency from them, thus affecting social relationships.<sup>17</sup> However, social isolation exposed the individual to a stressed psychosocial imbalance, characterized by stress, anxiety, anger and apathy, as well as a perception of isolation from society.<sup>18</sup> Therefore, during the COVID-19 pandemic, individuals increased the use of their electronic devices, particularly mobile phones, in order to balance the negative effects of social isolation, connecting with their friends and, at the same time, preserving the necessary social distancing. In this scenario, literature evidenced studies on the negative consequences of the excessive use of mobile devices during the pandemic.<sup>19,20</sup> Additionally, during the pandemic, one of the most damaged groups reported in literature were nurses, especially those who were at the forefront in the care of COVID-19 patients.<sup>21-25</sup> In fact, the literature explained how nurses lived this difficult period, characterized by heavy and prolonged shifts and the constant fear of contagion. As for the nursing profession, past evidence already suggested how nurses recorded a high incidence of stress and exhaustion in their professional life, which could lead to behavioral problems and psychiatric morbidities, such as: insomnia, anxiety, vague malaise, asthenia, headache, sleep disturbances (insomnia or hypersomnia), diffuse pains, dyspepsia and eating disorders.<sup>21-27</sup> Evidence suggested that nurses reported an inappropriate usage of their smartphones, with consequent behavioral challenges.<sup>28</sup> However, more clinical information appeared to be lost due to nurses being distracted by the use of their smartphones, a situation of which they also seemed to be unaware of.<sup>11</sup>

Undoubtedly, the COVID-19 pandemic further worsened the nurses' working conditions, and their consequent use of mobile devices; indeed, the literature emphasize the fear of contagion for themselves and their parents or friends.<sup>21-27</sup> Gutierrez-Puertas et al.<sup>8</sup> reported that 75% of the enrolled nurses use their phone at work for personal problems, and this overuse could impair their social relationships, resulting in a disregard of their responsibilities and the decline of their relations with colleagues, possible causing unemployment and a high staff turnover.<sup>19</sup> However, few articles in the literature describe the Italian nursing context.

## Objective

The present study aims to investigate the levels of nomophobia – in its four sub-dimensions – in young Italian nurses, as well as any differences due to socio-demographic variables, such as: gender, age, work experience and shiftwork.

## Materials and methods

### Study design

An observational cohort study was conducted from August 2021 to September 2021.

### Data collected

The questionnaire was created online through the Google Moduli function. It was publicized and administered through some nursing groups' Facebook and Instagram pages. Any Italian nurses employed in any different Italian care settings and aged less than 30 were included in this study.

### Search tool

The questionnaire contained two main sections. Specifically, in the first section the following socio-demographic data was collected:

- gender, whether the respondent was female or male (or 'other', indicating any definition not included before);
- age expressed in years, since only nurses aged less than 30 were included in this study; subjects were also classified into two age classes: up to 25 years old and between 26 and 30;
- work experience expressed in years, also classified into two groups, up to 1 year and over 2 years;
- shift, that is, whether the nurse worked only during one shift (morning), two shifts (morning and afternoon) and three shifts (morning, afternoon and night).

In the second section, the nomophobia condition was evaluated according to the 'Nomophobia questionnaire' (NMP-Q), Italian version.<sup>6,24,29</sup> This contained a total of 20 items aimed at assessing all symptoms occurring in the absence of any internet-connected mobile device. With each item, a 7-point Likert scale was associated, which ranged from zero ("strongly disagree") to 7 ("totally agree"). By summing each value associated for each item, a total score was obtained: scores up to 20 indicated no nomophobia condition; scores ranging from 21 to 59 diagnosed a mild level of nomophobia; scores from 60 to 99 identified a moderate level of nomophobia; and, finally, scores from 100 to 140 corresponded

to a severe nomophobia condition<sup>24</sup>. The NMP-Q was translated and validated in several languages all around the world and its consistency among the responses of multiple users was validated from other studies.<sup>6,24,29</sup> Additionally, four sub-dimensions of the nomophobia condition were identified:<sup>16</sup>

- sub-dimension I: "Not being able to communicate", by summing the scores of items no. 10, 11, 12, 13, 14, 15. Higher scores recognized a more complicated skill of the interviewer to communicate with others;
- sub-dimension II: "Losing connectedness", by summing the scores of items no. 16, 17, 18, 19, 20. Higher scores identified a greater fear to lose connectivity at any time;
- sub-dimension III: "Not being able to access information", by summing the scores of items no. 1, 2, 3, 4. Higher scores indicated a greater fear by the interviewer not to be able to get any information at any time;
- sub-dimension IV: "Giving up convenience", by summing item no. 5, 6, 7, 8, 9. Higher scores identified a greater fear to lose the convenience offered by smartphones, too.

#### Statistical analysis

All data were collected in an Excel data sheet, and statistical analyses were performed with the SPSS software, IBM, version 20. All socio-demographic characteristics and nomophobia levels were considered as categorical variables and presented as frequencies and percentages. Since the literature showed a normalized representation of the NMP-Q data, for each sub-dimensions,<sup>16</sup> differences according to gender, age, work experience and shift were assessed through the ANOVA test. Finally, all tests with  $p < 0.05$  were considered significant.

#### Ethical consideration

In the first part of the questionnaire the aim of this research study was clearly explained, and then the consent for participation was required. Therefore, all subjects who did not give their consent were not included in the present study. Additionally, no data collected will be disclosed and the anonymity of the data processed has been ensured.

The present study was approved by the Ethical Committee of Polyclinic in Bari, Italy, with protocol no. 6802/2021, and satisfied all ethical concerns included in the Declaration of Helsinki.

## Results

A total of 156 Italian nurses were enrolled in this study. All data collected is reported in Table 1.

**Table 1.** Sampling characteristics (n = 156)

Characteristics		No. (%)
Gender	Female	114 (73.08)
	Male	42 (26.92)
	Other (not specified)	0 (0)
Age	>25 years	78 (50.00)
	26-30 years	78 (50.00)
Years of work experience	>1 year	68 (43.60)
	<1 year	88 (56.40)
Shiftwork	One shift (morning)	32 (20.50)
	Two shifts (morning and afternoon)	20 (12.80)
	Three shifts (morning, afternoon, night)	104 (66.70)
Nomophobia level	Absent	0 (0)
	Mild	77 (49.40)
	Moderate	65 (41.70)
	Severe	14 (9.00)

By considering gender characteristics, significantly differences were reported in the sub-dimensions I, III and IV, where females recorded higher levels than males (Table 2).

As for the age characteristic, younger nurses (less than 25 years) reported significantly higher levels in all the four sub-dimensions of the nomophobia assessment tool (Table 3).

By considering work experience characteristics, significant differences were reported in sub-dimensions III ( $p = .006$ ) and IV ( $p = .035$ ), as nurses who worked less than 1 year appeared to be more worried to lose information or to give up the convenience provided by their connectivity (Table 4).

Finally, according to work shift, no significant differences were registered in nurses interviewed in the nomophobia sub-dimension assessment (Table 5).

## Discussion

The present study aimed to explore nomophobia levels in young Italian nurses and any differences depending on socio-demographic variables, such as: gender, age, years of work experience and shiftwork. Findings showed an interesting scenario, since no participant reported no nomophobia disorder, while 49.40% of the subjects enrolled registered mild levels, 41.70% moderate levels

**Table 2.** Differences in nomophobia sub-dimensions according to gender

Nomophobia sub-dimension /Gender		$\mu \pm sd$	95% CI min-max	F	p-value
Sub-dimension I "Not being able to communicate"	Female	22.76 $\pm$ 9.58	20.99-24.54	15.643	>.001*
	Male	16.33 $\pm$ 7.21	14.09-18.8		
	Total	21.03 $\pm$ 9.42	19.54-22.52		
Sub-dimension II "Losing connectedness"	Female	12.04 $\pm$ 6.68	10.80-13.28	.014	.906
	Male	11.90 $\pm$ 6.07	10.01-13.79		
	Total	12.01 $\pm$ 6.50	10.98-13.03		
Sub-dimension III "Not being able to access information"	Female	17.20 $\pm$ 6.30	16.03-18.37	16.878	>.001*
	Male	12.66 $\pm$ 5.56	10.93-14.40		
	Total	15.98 $\pm$ 6.42	14.96-16.99		
Sub-dimension IV "Giving up convenience"	Female	17.83 $\pm$ 7.08	16.52-19.15	10.134	.002*
	Male	13.98 $\pm$ 5.57	12.24-15.71		
	Total	16.79 $\pm$ 6.91	15.70-17.89		

\*p <.05: statistical significance. Sd: standard deviation.

**Table 3.** Differences in nomophobia sub-dimensions according to age

Nomophobia sub-dimension /Age		$\mu \pm sd$	95% CI	F	p-value
Sub-dimension I "Not being able to communicate"	Up to 25 years	22.77 $\pm$ 9.71	20.58-24.96	5.455	.029*
	26-30 years	19.29 $\pm$ 8.85	17.30-21.29		
	Total	21.03 $\pm$ 9.42	19.54-22.52		
Sub-dimension II "Losing connectedness"	Up to 25 years	13.14 $\pm$ 6.66	11.64-14.64	4.867	.029*
	26-30 years	10.87 $\pm$ 6.17	9.48-12.26		
	Total	12.01 $\pm$ 6.50	10.98-13.03		
Sub-dimension III "Not being able to access information"	Up to 25 years	16.99 $\pm$ 6.75	15.46-18.51	3.904	.050*
	26-30 years	14.97 $\pm$ 5.95	13.63-16.31		
	Total	15.98 $\pm$ 6.42	14.96-16.99		
Sub-dimension IV "Giving up convenience"	Up to 25 years	18.01 $\pm$ 7.48	16.32-19.70	4.974	.027*
	26-30 years	15.58 $\pm$ 6.08	14.21-16.95		
	Total	16.79 $\pm$ 6.97	15.70-17.89		

\*p <.05: statistical significance. Sd: standard deviation.

**Table 4.** Differences in nomophobia sub-dimensions according to work experience

Nomophobia sub-dimension /Work experience		$\mu \pm sd$	95% CI	F	p-value
Sub-dimension I "Not being able to communicate"	≥1 year	22.68 ± 9.74	20.31-25.03	3.736	.055
	>2 years	19.76 ± 9.02	17.85-21.67		
	Total	21.03 ± 9.42	19.54-22.52		
Sub-dimension II "Losing connectedness"	≥1 year	12.87 ± 7.01	11.17-14.56	2.130	.147
	>2 years	11.34 ± 6.04	10.06-12.62		
	Total	12.01 ± 6.50	10.98-13.03		
Sub-dimension III "Not being able to access information"	≥1 year	17.57 ± 6.95	15.89-19.26	7.739	.006*
	>2 years	14.75 ± 5.72	13.54-15.96		
	Total	15.98 ± 6.42	14.96-16.99		
Sub-dimension IV "Giving up convenience"	≥1 year	18.12 ± 7.98	16.19-20.05	4.521	.035*
	>2 years	15.77 ± 5.79	14.54-17.05		
	Total	16.79 ± 6.91	15.70-17.89		

\*p <.05: statistical significance. Sd: standard deviation.

**Table 5.** Nomophobia sub-dimensions' differences according to shiftwork

Nomophobia sub-dimension /shiftwork		$\mu \pm sd$	95% CI	F	p-value
Sub-dimension I "Not being able to communicate"	1 shift	23.25 ± 9.34	19.88-26.61	1.230	.295
	2 shifts	19.55 ± 8.20	15.71-23.38		
	3 shifts	20.63 ± 9.63	18.76-22.51		
	Total	21.03 ± 9.42	19.54-22.52		
Sub-dimension II "Losing connectedness"	1 shift	13.28 ± 7.73	10.49-16.07	.835	.436
	2 shifts	12.15 ± 5.69	9.50-14.80		
	3 shifts	11.59 ± 6.25	10.37-12.80		
	Total	12.01 ± 6.50	10.98-13.03		
Sub-dimension III "Not being able to access information"	1 shift	17.36 ± 6.28	15.11-19.64	1.064	.348
	2 shifts	16.25 ± 7.17	12.89-19.61		
	3 shifts	15.50 ± 6.31	14.27-16.73		
	Total	15.98 ± 6.42	14.97-16.99		
Sub-dimension IV "Giving up convenience"	1 shift	18.78 ± 7.02	16.25-21.31	1.752	.177
	2 shifts	15.75 ± 5.20	13.31-18.18		
	3 shifts	16.38 ± 7.09	15.01-17.76		
	Total	16.79 ± 6.91	15.70-17.89		

\*p <.05: statistical significance. Sd: standard deviation.

and 9.00% severe levels. Additionally, the present findings detail a more specific image of the nomophobic nurse, as: female, aged less than 25 years and with less than 1 year experience, regardless of the shift. The present data seems to be in agreement with the current literature, since nomophobia appears to also include the academic and professional fields, involving the nursing work and training environments, by drawing a clearer picture of the nomophobia levels in healthcare professionals. Specifically, the nomophobia condition among nurses and nursing students, at various levels, will possibly induce negative consequences, both in the social<sup>4,30</sup> and professional<sup>11,31</sup> contexts. Several studies reported high levels of nomophobia in the healthcare settings, as reported in the studies by Bivin et al. (23%)<sup>32</sup> and Kar et al. (21%).<sup>33</sup> Also Alahmari et al.<sup>34</sup> reported a prevalence of 22% of severe nomophobia among undergraduate students in Saudi Arabia. Furthermore, nomophobia causes an “over-connection syndrome”, due to the disproportionate use of mobile phone use, that reduces the face-to-face relations among people, in all their social and family contexts. Additionally, evidence suggests that nomophobic subjects will also become depressed in later life.<sup>4</sup> Other evidence suggests a high prevalence of nomophobia, as reporting in the study of Sethia et al.<sup>35</sup> at Bhopal in 2016: the prevalence of nomophobia was 99.8%; specifically, 32.15%, 61.5% and 6.15% recorded mild, moderate and severe nomophobia, respectively. Therefore, smartphones seem to lead to several problems associated with their uncontrolled and excessive use but, on the other hand, they are able to perform an extensive range of daily tasks, such as: calling and writing other people, checking and sending emails, programming appointments, surfing the internet, online shopping, social networking, reading, video watching, and gaming.<sup>36,37</sup> Moreover, another study explored nomophobia levels in 270 young business professionals during their work, and suggested that nomophobia induces negative psychological conditions, with particular reference to stress.<sup>38</sup>

Additionally, the present findings suggest that significant differences in nomophobia levels are present between female and male nurses, in all the four sub-dimensions, with the exception of the second, “losing connectedness”. In this regard, the present findings are in disagreement with the current literature, where higher nomophobia levels in males than in females are reported. For example, Farooqui et al.<sup>39</sup> investigated nomophobia levels among undergraduate and postgraduate degree students, and Pooja et al.<sup>40</sup> did the same among medical undergraduates, recording an inverse trend compared to the present findings. This could be explained by the higher level of freedom that males have in their homes and societies, which is greater than that of females, who in several regions of developing coun-

tries, like India, experience more parental control. Therefore, the differences in nomophobia levels recorded could be explained with the different geographic location and culture between the two studies considered.<sup>41</sup> Also, the literature reported that gender differences may be due to the fact that males believe that the technology of mobile devices improves their independence level, while females utilize the mobile phone mainly for communication and social networking, and to stay connected with friends and family.<sup>42</sup>

### Limitations

The present study reports interesting data, but has also several limitations. First of all, the research method had several limitations, since the questionnaire was disseminated online through some ‘spontaneous’ Facebook and Instagram pages, producing bias concerning the sense of belonging to the nursing category, which could also influence the work-stress-related experience linked with nomophobia. Additionally, the questionnaire was administered online, which could affect the enrolment of participants; also, it being a self-reporting tool, participants may have been more predisposed to express the most socially acceptable answer, rather than being truthful. However, the use of the websites of several professional associations may induce higher heterogeneity in the enrolled sample, which cannot be considered as representative. Secondly, it should be noted that the study was conducted during the COVID-19 pandemic, which could have increased the tendency to higher nomophobia levels and their related effects.<sup>21-27</sup> Therefore, it would be very interesting to conduct another research including more homogeneous samples and contextual conditions, in order to comprehend the possible factors, also because in many situations electronic technologies have even become more helpful in preserving communication, if not even, in particular geographical regions, the only possible way to contact other people. However, the fact that nomophobia was identified in Italian young nurses highlights the relevance of the present research.

### Conclusion

Today, communication technologies – in the form of smartphones, personal computers, tablets, video games – affect people’s social behaviors, by inducing an increasingly need to stay or feel connected, thus developing a nomophobic condition.<sup>31</sup> Subjects suffering from nomophobia disorder prefer virtual relations, exclude face-to-face social interactions and also have a disproportionate fear of being disconnected, thereby not receiving public attention. Additionally, the COVID-19 pandem-

ic increased the nomophobic trend and contributed to an increasing prevalence of anxiety disorders, especially in the healthcare sector, first of all among the nurses, who were at the forefront in the care of COVID-19 patients.<sup>21-27</sup> Therefore, there is an urgent need for the nursing community and the educational institutes to coordinate and take the necessary measures to ensure both sufficient information and education about nomophobia and, at the same time, to provide the tools to understand the reasons for such mental health disorders as anxiety, panic attack, stress and so on.

In conclusion, there is an urgent need for the nursing community and educational institutes to introduce a prudent use of smartphones by professionals, especially in this historical moment, when the use of smartphones has become essential in order to close the physical distances imposed by the COVID-19 pandemic.<sup>43</sup>

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## Key messages

- By becoming an essential tool for everyone, smartphones are increasingly affecting people's lives, also among young nurses, none of whom reported the total absence of nomophobia disorder.
- A more detailed image of the nomophobic nurse was identified as: female, aged less than 25 years and worked less 1 year, regardless of the shift.
- Significant differences in nomophobia levels were reported between female and male nurses, in all the four sub-dimensions, with the exception of the second ("losing connectedness").
- There is an urgent need for the nursing community and educational institutes to introduce a prudent use of smartphones by professionals, especially in this historical moment, when the use of smartphones has become essential in order to close the physical distances imposed by the COVID-19 pandemic.

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*Ethics approval:* the present study was approved by the Ethical Committee of Polyclinic in Bari, Italy, with protocol no. 6802/2021, and satisfied all ethical concerns included in the Declaration of Helsinki.

*Informed consent:* all subjects who did not give their consent were not included in the present study. No data collected will be disclosed and the anonymity of the data processed has been ensured.

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