Policy recommendations on nurses’ use of smartphones in the Philippines

John Robert Bautista\textsuperscript{a,b,}\textsuperscript{*}

\textsuperscript{a} School of Information, The University of Texas at Austin, Austin, TX, USA
\textsuperscript{b} Center for Health Communication, Moody College of Communication, The University of Texas at Austin, Austin, TX, USA

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ABSTRACT

Background: One key technology that has significant implication on how nurses communicate and share information is the mobile phone, particularly the smartphone. However, its use for clinical work should be regulated by policies to minimize risks and maximize benefits.

Objective: To present policy recommendations on nurses’ use of smartphones that are applicable in the context of clinical work in the Philippines.

Materials and method: The policy recommendations were developed by synthesizing findings of a mixed-method research on nurses’ use of smartphones in the Philippines conducted from January to July 2017.

Results: The four policy recommendations are: (1) improving existing technologies to reduce smartphone usage, (2) providing adequate unit phones and service credits, (3) implementing realistic policies, and (4) educating nurses on the implications of using smartphones at work.

Discussion and conclusion: Although these recommendations might not be ideal considering that smartphone use also presents drawbacks, a pragmatic decision to allow nurses to use it for communication and information seeking purposes can help enhance the quality of care given to patients and nurses’ work productivity in settings with scarce manpower and technology. Nonetheless, hospitals should find these recommendations as a temporary solution, and they should strive to come up with a long-term solution of providing nurses with appropriate technologies to facilitate clinical work.

What was already known about the topic?

• Nurses use their smartphones for work purposes in the Philippines.
• Policies are needed to guide the use of technology in clinical work.
• Little research focuses on policy recommendations on nurses’ use of smartphones.

What this study added to our knowledge

• This paper proposes four policy recommendations on nurses’ use of smartphones that are applicable in the context of clinical work in the Philippines.
• Nurse administrators should implement sound policies on the use of smartphones by considering the resources that their hospital have.
• The proposed recommendations are applicable in other developing countries where smartphone use in clinical settings are prevalent.

1. Introduction

Communication is a fundamental aspect of nursing practice as nurses interdependently work with other healthcare professionals [1]. Aside from communicating with patients, much of the nurses’ work involves the communication of relevant information with several members of the healthcare team [2,3]. This is for the fact that timely communication among healthcare professionals is a critical component of ensuring safe and quality patient care [4]. Given the importance of timely communication and information sharing in nursing practice, there is always a need for technologies that can support the communication and information needs of nurses [5].

One key technology that has significant implication on how nurses communicate and share information is the mobile phone, particularly the smartphone. Parker argues that communication in nursing practice is undergoing a revolution since nurses’ ownership of smartphones enables them to easily communicate with other healthcare professionals, access clinical information, and perform other tasks for work purposes [6]. Various surveys suggest that nurses use their smartphones to facilitate communication and information seeking [7–10].

Although several scholars have examined the use of mobile phones as a key technology for communication and information exchange among healthcare workers (e.g., midwives, community health workers,
and traditional birth attendants) in the community setting [11,12], nurses’ use of smartphones for work purposes in hospital settings is still under scrutiny due to various issues, such as work distraction and privacy concerns [10,13]. Nonetheless, some scholars suggest that hospitals should revisit their policies to find ways on how to appropriately integrate nurses’ use of smartphones for work purposes while limiting the risks involved in its use [8,14], especially in developing countries where resources are limited [15]. Hence, the purpose of this paper is to provide policy recommendations on nurse’s use of smartphones for work purposes in the Philippines – a Southeast Asian country where the use of health information technology is lagging [16,17] and the nursing workforce is in a decline [18].

2. Method

The policy recommendations were developed based on mixed-method research conducted in the Philippines from January to July 2017. The research was borne out of preliminary qualitative work on nurse’s use of smartphones in the Philippines conducted in July 2015 [17,19]. Building on the findings of that preliminary work, a survey of 517 staff nurses from 19 private and government hospitals was conducted to identify the extent of how nurses use their smartphones for work and non-work purposes, including the predictors and outcomes associated with it. Please refer to [20] and [21] for more details of the survey component of this mixed-method research. Briefly, the survey found that nurses use their smartphones for communication (e.g., text messaging and voice calls with healthcare professionals), information seeking (e.g., using mobile Internet for information seeking), and documentation purposes (e.g., taking a picture of patient records for documentation) [20]. Moreover, the survey also revealed several predictors (i.e., perceived organizational support, injunctive norm, descriptive norm, perceived behavioral control and intention) and outcomes (i.e., perceived work productivity and perceived quality of care) of nurses’ use of smartphones for work purposes [21].

Aside from a survey of staff nurses which focuses on the end-users of smartphones, the study also conducted nine focus groups among 43 nurse administrators (i.e., head nurses, nurse supervisors, and nurse managers) employed in nine hospitals that were part of the survey study. The purpose of the focus group is to understand several issues that come with smartphone use in hospital settings. The focus group was also beneficial because it also served as the primary basis of the policy recommendations presented in this paper. Please refer to [16] for more details of the qualitative component of this mixed-method research. Briefly, the focus groups show that nurse administrators were encouraged to support nurses’ use of smartphones for work purposes when (1) personal smartphones are superior to workplace technologies, (2) personal smartphones resolve unit phone problems, and (3) policy is unrealistic to implement [16]. Conversely, issues that inhibited nurse administrators to support nurses’ use of smartphones for work purposes include (1) smartphone use for non-work purposes and (2) misinterpretation by patients [16].

Overall, the results of the survey and focus groups were synthesized to come up with policy recommendations that considers the nature of clinical work in the Philippines. The Philippines is an interesting case for this research because it is a developing country where health information technology is lacking [16,17] and the nursing workforce is in a decline [18]. Therefore, as nurses there use their own smartphones to overcome these obstacles, there is a greater need for research-based policy recommendations when hospitals craft guidelines in the use of such technology for clinical work.

3. Results and discussion

The rationale for these policy recommendations is for hospital administrators to ensure that nurses’ smartphone use is explicitly regulated in hospitals. As such, these can be considered by hospitals that have different financial status. For instance, hospitals can fully implement recommendation 1 (i.e., improve existing technologies to reduce smartphone use) and recommendation 2 (i.e., provide adequate unit phones and service credits) if they have the budget to provide their nurses with sufficient technologies for them not to use their smartphones at all. However, it is important to note that implementing recommendations 1 and 2 would be difficult for most hospitals due to pre-existing budget constraints [16]. In relation to that, it would be unfair for nurses if the hospital implemented a blanket ban on personal smartphones without implementing recommendations 1 and 2, thus the need to consider recommendation 3 which is to implement a realistic policy (i.e., allowing regulated personal smartphone use due to lack of hospital-owned information and communication technologies) and recommendation 4 which is to educate nurses about the responsible use of personal smartphones at work. In general, hospital administrators must consult various stakeholders to appropriately implement the policy recommendations presented in this paper.

3.1. Recommendation 1: improve existing technologies to reduce smartphone use

In principle, nurses should use existing health information technologies available at their workplaces because hospitals have the responsibility to provide such technologies [22]. Based on the findings of the focus groups [16], a common problem with these technologies (e.g., landline telephones, intercom systems, and desktop-based messaging applications) is that they were insufficient to meet the communication and information seeking needs of nurses. According to Stephens [23], typical communication technologies in the hospital are stationary, and these tend to hinder the mobile nature of nurses’ work when facilitating patient care with other mobile healthcare colleagues. The problems associated with these stationary technologies become reasons why nurse administrators allow nurses to use smartphones for work purposes [16]. Besides, as shown in the survey [21], nurses have the skills and capabilities to use smartphones for work purposes, and considering that they are willing to use it just to immediately complete their task, it is not surprising they would prefer to use smartphones over these technologies. This is more pertinent during emergencies where immediate communication among the healthcare team is crucial to save a patient’s life [16].

Based on those findings, one way for hospitals to reduce (if not eliminate) nurses’ use of smartphones for work purposes is to improve existing technologies. There are several ways to do this. First, hospitals should have landline telephones and intercom systems for each nursing area. Having these technologies readily available to nurses can help reduce the need to use smartphones for voice calls to contact colleagues within hospital premises, particularly during routine and non-emergency situations. Moreover, hospitals can upgrade the functionality of their landline telephones by using cordless telephones and by allowing nurses to make mobile phone calls in it. In most situations, landline telephones are stationary and are limited to voice calls to other telephones within the hospital; however, using cordless telephones (landline phones with wireless handsets) – although bulky and less functional compared to mobile phones [23] – can provide the flexibility to be used on the go. Moreover, as shown in the focus groups [16], some nurse administrators suggested that being able to call a mobile phone using a landline telephone was useful to contact doctors that are outside hospital premises. Although this might not be a reliable means of communication during emergency situations, being able to contact a doctor using a cordless phone that has the function to call mobile phone numbers can be beneficial for routine and non-urgent communication. To a certain extent, by providing these features, it can potentially reduce nurses’ need to use their own smartphones for voice calls. Although these simple technologies should be present in hospitals, some hospitals might likely find it difficult to obtain them for nurses considering that setting up such telecommunication systems is costly in the
Philippines [24]. Nonetheless, hospitals can work with vendors to obtain these technologies within budget.

Second, hospitals can explore using desktop-based messaging applications. Although the focus groups revealed that this is only limited to text messaging and has usability [16], such technology can help nurses communicate with colleagues through text messaging. By combining landline telephones for voice calls and desktop-messaging applications for text messaging, nurses can reduce the need to use their smartphones for work purposes. Considering that installing a messaging application requires an Internet-connected desktop computer, hospitals can also improve the functionality of their desktop computers by providing Internet access so that nurses can use it for information seeking. To ensure appropriate Internet use, access to unwanted websites, such as social media websites (e.g., Facebook, Youtube, Instagram, Twitter, etc.) should be restricted considering that nurses have the tendency to use such technology for non-work purposes. Alternatively, if budget permits, hospital administrators can explore the use of a dedicated smartphone-based healthcare messaging application that needs to have several crucial security features, such as secure login, data encryption, and compliance to data privacy standards (e.g., HIPAA compliance).

Although providing Internet-connected desktop computers can be a solution to limit nurses’ use of smartphones for communication and information seeking purposes, it is essential to recognize that this recommendation might not be feasible for most hospitals in the Philippines considering that even simple technologies, such as landline telephones and intercom systems, are already difficult to provide. Furthermore, aside from having one of the slowest Internet speeds in Asia, Internet access in the Philippines is one of the most expensive globally [25], thus presenting cost constraints. Nonetheless, hospitals should consider providing Internet-connected desktop computers in the future since the government is currently modernizing the country’s health information system by requiring healthcare facilities to have electronic health records can be installed [26].

Fig. 1 provides a summary of the key research findings leading to the first recommendation.

### 3.2. Recommendation 2: provide adequate unit phones and service credits

Aside from providing nurses with landline telephones (that are cordless and can contact mobile phone numbers), intercom systems, and desktop-based messaging applications, another option for hospitals is to provide unit phones so that nurses can use these instead of their smartphones. In this research, unit phones refer to mobile phones that are provided by the hospital. Survey results suggest that the presence of a unit phone is negatively associated with the intention to use smartphones for work purposes [21]. To date, hospitals can provide a unit phone that is either a feature phone or smartphone. During focus groups, some nurse administrators expressed that they would like to have feature phones since it is cheap, durable, and, more importantly, it is less likely to be used for non-work purposes (e.g., mobile games and social media) [16]. Besides, some also noted that feature phones were sufficient to meet nurses’ needs because they usually just use their smartphones for work purposes through voice calls and text messaging. The survey results support this claim considering that nurses frequently used their smartphones to exchange voice calls and text messages with fellow nurses and doctors [20]. On the contrary, others would like to have a smartphone since they would like to use it not only for communication purposes but also for information seeking (e.g., access the Internet for clinical information) and documentation purposes (take pictures of patient-related outcomes or events) [16].

Although nurses’ preferences can be considered when selecting a unit phone, hospitals would likely decide based on their budget. For example, those with a large budget can opt for smartphones but those with a small budget can opt for feature phones. However, providing smartphones can greatly limit the use of nurses’ personal smartphones considering that this device can be used for communication, information seeking, and documentation purposes. In general, providing unit phones might be a solution to existing communication and information barriers faced by mobile healthcare professionals considering that stationary technologies provided by hospitals (e.g., landline telephones and even cordless ones) are insufficient in meeting their needs for microcoordination and for providing quality care to patients [23].

Another aspect that needs to be considered is the appropriate number of unit phone to be shared by nurses. Based on focus groups, nurse administrators observed that their nurses preferred to use their own smartphones instead of waiting for others who are using the unit phone [16]. Although providing a unit phone is straightforward, coming up with an appropriate number of unit phone is challenging. Nonetheless, the focus groups indicate that a unit phone can be shared by three nurses and this can be adopted as a preliminary basis for the number of unit phones to be given [16]. However, considering that each nursing unit is different in terms of function (provision of general or specialized care) and size (number of patients and nurses), it is up to nurse administrators to determine if a certain number of unit phones

### Key research findings

- Perceived behavioral control is positively associated with nurses’ intention to use smartphones for work purposes (survey).
- Intention is positively associated with nurses’ use of smartphones for work purposes (survey).
- Existing hospital technologies are insufficient to meet nurses’ need for communication and information seeking (focus groups).

### Recommendation 1: Improve existing technologies to reduce smartphone usage

- Increase the function of landline telephones by upgrading to a cordless telephone and allowing it to contact mobile phones to reduce the need for smartphones.
- Provide each nursing area with an Internet-enabled desktop computer that can be used for information seeking. This can also be used to access messaging applications for communication purposes.

**Fig. 1.** Key research findings and recommendation 1.
would completely meet nurses’ needs. Ultimately, the decision on how many would be provided rests heavily on the hospital’s budget.

Aside from providing unit phones to nurses, hospitals should also give adequate service credits (i.e., stored value that can be used for text messaging, voice calls, and mobile Internet access) so that the unit phone can be used when needed. Based on focus groups, nurse administrators allowed their nurses to use smartphones because their unit phone did not have any service credits or they are afraid to entirely consume the remaining service credits in situations where a colleague who uses a different service provider needs to be contacted [16]. To reduce, if not eliminate, the need for nurses’ smartphones, hospitals should provide adequate service credits to the extent that there is no need to consider the type of service provider. Considering that a definite amount of service credits is challenging to be deemed as adequate, hospitals should consult nurse administrators to propose a monthly budget for unit phone service credits in their respective areas of assignment.

Nonetheless, the adequacy of unit phone service credits relies on the type of subscription. Although the focus groups showed that service credits were usually given monthly under prepaid subscription, hospitals can also consider a postpaid subscription [16]. While prepaid subscription offers a fixed amount of service credits to be used per month, providing a postpaid subscription might offer more flexibility since most service providers in the Philippines can tailor fit their postpaid services based on the needs of organizations. Besides, postpaid subscription usually comes bundled with a mobile phone (usually a smartphone) that can be used as a unit phone. On the practical side, customers of postpaid subscriptions have access to a report that shows the extent of mobile phone use (e.g., determine mobile numbers where calls were made and text messages were sent). This report will be useful for nurse administrators when auditing if the unit phone was used only for work purposes and not for personal means. Nonetheless, the decision on which type of subscription to select still depends on the available budget that a hospital can allocate. Accordingly, those with a large budget can opt for a prepaid subscription.

Fig. 2 provides a summary of the key research findings leading to the second recommendation.

### Key research findings

- Hospitals do not provide unit phones to nurses. Those that provide unit phone have nurses that are less likely to use their own smartphones (survey and focus groups).

- Hospitals do not provide adequate unit phones and service credits to nurses (focus groups).

### Recommendation 2: Provide adequate unit phones and service credits

- Provide nurses with unit phones. Hospitals can provide a feature phone (less expensive and functional) or smartphone (more expensive and functional) depending on budget.

- The unit phones to be provided per area can depend on the number of nurses. A unit phone can be shared by a maximum of three nurses.

- Hospitals can select prepaid (less expensive and flexible) or postpaid (more expensive and flexible) subscription for their unit phones. The decision depends on budget.

3.3. **Recommendation 3: Implement realistic policies**

Policies govern the use of health information technologies, and they are needed to maximize its benefits and limit their risks to patients [27]. Furthermore, such policies need to be realistic based on the context of where it will be implemented [28]. Just like other health information technologies, it is crucial for hospitals to define how, when, and where nurses can use their smartphones at work [14]. To do this, the first step that hospitals need to be clear is whether they would allow nurses to use their smartphones at work. Based on focus groups, most private hospitals implement a ban on mobile devices despite not providing a unit phone to their nurses [16]. On the contrary, due to lack of technological resources, most government hospitals are relatively lenient with the use of smartphones at work if it is only used for work purposes.

These findings suggest that if hospitals were to implement a complete ban on any mobile devices at work, they would need to ensure that adequate technologies are in place for nurses to use. Such technologies should include (but not limited to) landline telephones (that are cordless and can be used to call mobile phones), Internet-enabled desktop computers (that can be used to send text messages), and intercom systems. More importantly, these should also include unit phones (feature phone or smartphone) with sufficient service credits since relying only on upgrading existing stationary technologies (e.g., landline telephones, desktop computers, and intercom system) may be insufficient for nurses to facilitate crucial microcoordination with other healthcare professionals in and out of the hospital when providing the best possible quality of care to patients [23].

As shown in the focus groups [16], nurse administrators from hospitals that implement a policy that bans the use of mobile devices think that such policy is difficult to implement considering that their hospitals do not have the adequate technologies and resources for nurses to avoid using their smartphones for work purposes. Scholars argue that organizations that do not provide adequate technologies to staff and implement a restrictive policy that prevents workers from using their mobile phones for work purposes can result in reduced work productivity and overwhelming tasks and burden for supervisors [23,29]. Such restrictive policy, in combination to failure to provide relevant workplace technologies, can also become a barrier to provide better
patient service since smartphones (possibly the only technology that is available to them) could enable nurses to improve the quality of care even at their own cost [15,30]. Results of the survey support these claims since nurses’ use of smartphones for work purposes is positively associated with perceived quality of care and perceived work productivity [21]. Therefore, hospitals should consider their capacity to provide adequate technologies before shifting to a policy that completely bans the use of smartphones for work purposes.

A potential solution, especially to hospitals that do not have adequate technologies and resources, is to explicitly indicate in their policy that mobile devices, such as feature phones or smartphones, can be used at work for work purposes. Besides, the findings of the survey [21] and focus groups [16] suggest that the use of smartphones for work purposes is pervasive among healthcare staff (i.e., descriptive norm) and there is an expectation to use it for work purposes (i.e., injunctive norm). However, as noted in the focus groups, such policy needs to emphasize that it should only be used for work purposes and not for non-work purposes (e.g., making personal calls and text messages, accessing social media, and playing mobile games) [16].

Although some hospitals in the focus groups already had policies allowing the use of mobile phones for work purposes, a pertinent finding is that these were not specific enough because examples of work and non-work purposes were not listed [16]. While using a strategically ambiguous policy (i.e., just stating that it should only be used for work purposes and not for non-work purposes) can provide flexibility in terms of interpretation, such policy tends to be confusing and can result in conflicts [29]. For instance, although some of the nurse administrators during focus groups think that using a smartphone’s camera to take pictures or videos to document clinical records, events, or outcomes [16], its use—even it is for work purposes—should not be allowed considering that these actions may risk patient privacy and confidentiality [10,14]. Furthermore, hospitals that would like to create a policy that allows nurses to use their smartphones for work purposes should specify that it can be used only for communication (e.g., making calls, sending text and instant messenger messages) and information seeking (e.g., searching for clinical information on websites, apps, and e-books) purposes. Activities such as accessing social media, watching videos, and mobile gaming should be prohibited considering that these are non-work-related use of smartphones, and can lead to decreased quality of care and work productivity [21]. Although these are suggestions, nurse administrators could further deliberate on what other uses of smartphones can be allowed or prohibited at work.

Another aspect that needs to be clarified in the policy is when and where to use smartphones for work purposes. Based on the focus groups, the policy needs to emphasize that nurses should always attend to their patients first and smartphones should not be used in front of them or their representatives (e.g., relatives, legal guardian, and significant others) unless there is an urgent need to do so [16]. Ideally, nurses should only use their smartphones in the nurses’ station since it is where they usually perform communication and information seeking tasks [31]. Specifying when and where to use smartphones for work purposes also needs to be reflected in the policy to avoid instances of phubbing (intentionally or unintentionally snubbing a person due to mobile phone use) [32] because it can compromise the nurse-patient relationship [33]. To minimize potential complaints, nurses should also assure patients that their use of smartphones is to facilitate prompt nursing care. Moreover, additional safeguards should be implemented in specific clinical areas, such as intensive care units and operating rooms. For instance, smartphones should not be brought into the sterile areas of operating rooms to reduce the spread of harmful microorganisms [34]. Also, for nurses assigned in intensive care units, smartphones should not be used within a meter of certain medical devices (e.g., mechanical ventilators, infusion pumps) to prevent potential malfunction due to electromagnetic interference [35].

The policy also needs to indicate corresponding disciplinary actions when nurses commit violations of the use of smartphones at work. This needs to be explicitly stated so that all nurses are aware of the repercussions associated with the irresponsible use of smartphones at work. Although this may vary from one hospital to another, hospitals routinely enforce these disciplinary actions when nurses commit violations (starting from the least to the highest severity): verbal reprimand, written reprimand, suspension, and termination [36]. Although the focus groups revealed that some nurse administrators enforced fines and confiscation as disciplinary actions [16], such punishments are not ideal since they are not part of routine disciplinary actions for other violations committed by nurses (e.g., medication errors) [36]. On the other hand, imposing fines will only add to the financial burden that nurses are currently experiencing [37]. As such, punishments for such violations need to be consistent with routine disciplinary actions that are implemented in most healthcare institutions, and punishments such as fines and confiscation should be avoided.

This policy also needs to align with the Philippine’s Data Privacy Law of 2012 to mitigate privacy and confidentiality risks associated with the use of smartphones for work purposes [38]. For instance, hospitals can specify when should nurses delete patient data in their smartphones after its purpose has been achieved (e.g., when to delete after patient information has been used for patient referral to the doctor). It can also be used as a basis to remind nurses to be mindful of only sending a patient’s health information to authorized health personnel (i.e., members of the healthcare team) for work purposes.

Overall, a realistic and specific policy should be created and implemented so that hospitals can regulate nurses’ use of smartphones at work and mitigate confusion brought by ambiguous policies. Nonetheless, hospitals need to recognize that a policy that supports nurses’ use of smartphones for work purposes is a temporary solution for meeting the technology needs of nurses. While using smartphones for work purposes is an act of beneficence on the part of nurses for patients, it cannot guarantee full privacy and confidentiality. A long-term plan that involves acquiring technologies that can reduce – if not eliminate – smartphone use should be considered since the use of personal devices in hospital settings presents several costs (e.g., nurses use their own money to use smartphones for work purposes [13]) and security concerns (e.g., privacy and confidentiality risks to patient information shared using personal devices [8–10]). Moreover, hospital policymakers should acknowledge that before implementation, a draft of the policy needs to be presented to different stakeholders (e.g., staff nurses, nurse administrators). Acquiring feedback from stakeholders is necessary so that the policy is appropriate (ethically and legally) to the work setting and acceptable to the majority. This will also help make sure that the policy would be implemented appropriately.

Fig. 3 provides a summary of the key research findings leading to the third recommendation.

### 3.4. Recommendation 4: educate nurses on the implications of using smartphones at work

Although policies can delineate how, when, and where smartphones should be used at work, nurses must be given the opportunity to internalize the details in these policies. Simply implementing a policy without educating nurses on the implications of using smartphones at work might not result in intended outcomes (e.g., use of smartphone for work purposes only, non-usage of smartphone camera for photos or videos). Besides, educating nurses about the contents of the policy is an effective communication strategy that can help with appropriate policy implementation.

One way to educate nurses is to hold information sessions regarding the implications of using smartphones at work. For instance, using the results of the survey [20,21] and focus groups [16], hospital administrators can hold workshops to inform nurses that using smartphones for work purposes can improve the quality of care rendered to patients. More importantly, it should also be emphasized that the opposite of these outcomes is bound to happen when smartphones are used for non-
work purposes. Educational sessions can also be a good venue to emphasize what would qualify as the use of smartphones for work and non-work purposes. Considering that hospitals tend not to provide a list of do’s and don’ts of smartphone use at work [16], a lecture can be conducted to instruct nurses that smartphones can be used for communication and information seeking purposes since it resembles its use for work purposes [21]. On the other hand, the lecture should emphasize that using smartphones for non-work purposes, such as accessing social media and playing mobile games, is prohibited. Finally, such sessions can be a platform where hospital administrators can obtain feedback to revise the policy before implementation.

Aside from face-to-face sessions, infographics can be used to convey details of the policy. The use of infographics can help communicate key policy details in a summarized, concise, and engaging manner. Besides, previous studies showed that healthcare professionals prefer infographics than text summaries when reading key information from research outcomes [39,40]. To increase the reach of the infographics, these can be disseminated not only by posting them in relevant areas of the hospitals but by sending them in email accounts of nurses. Thus, infographics can be used as an additional strategy to educate nurses on the implications of using smartphones at work.

Fig. 4 provides a summary of the key research findings leading to the fourth recommendation.

4. Conclusion

The smartphone is an instrumental device that can be used to facilitate personal and work-related tasks. For healthcare professionals

### Fig. 3. Key research findings and recommendation 3.

<table>
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<tr>
<th>Key research findings</th>
<th>Recommendation 3: Implement realistic policies</th>
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<tbody>
<tr>
<td>Some hospitals implement a blanket ban on mobile devices despite lack of existing workplace technologies to support nurses’ work (focus groups).</td>
<td>Hospitals should assess whether they can provide their nurses with adequate technology before implementing a blanket ban on mobile devices.</td>
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<tr>
<td>Nurse administrators in hospitals that implement a blanket ban on mobile devices allow their nurses to use smartphones for work purposes (focus groups).</td>
<td>Hospitals that do not have adequate technologies should implement realistic policies by allowing nurses to use their smartphones for work purposes. However, a long-term plan on acquiring technologies that can reduce-if not eliminate-smartphone use should be considered.</td>
</tr>
<tr>
<td>Some hospitals allow nurses to use their smartphones if it is used only for work purposes (focus groups).</td>
<td>Hospitals should specify how smartphones can be used for work purposes (e.g., allowed for work-related calls and text messages; use clinical apps). They should also specify examples of restricted smartphone use (e.g., social media, playing games; photo or video recording).</td>
</tr>
<tr>
<td>Nurses’ use of smartphones for work purposes is positively associated with perceived quality of care and perceived work productivity (survey).</td>
<td>As much as possible, nurses should cater to their patients first before using smartphones to avoid unintended phubbing. If there is a need to use it, nurses should explain to patients why they are using it.</td>
</tr>
<tr>
<td>Hospitals do not provide a specific list of do’s and don’ts of smartphone use at work (focus groups).</td>
<td>Instruct nurses to only use their smartphones for work purposes in the nurses’ station. Other specific instructions should be conveyed to nurses in operating theatres (e.g., not permitted in sterile areas) and intensive care units (e.g., not permitted within a meter of a medical device).</td>
</tr>
<tr>
<td>Nurses’ use of smartphone for non-work purposes is negatively associated with perceived quality of care and perceived work productivity (survey and focus groups).</td>
<td>Appropriate disciplinary action should be given, starting from a verbal reprimand, written reprimand, suspension, up to termination.</td>
</tr>
<tr>
<td>Some disciplinary actions against using smartphones for non-work purposes include fines and confiscation (focus groups).</td>
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situated in developing countries, it is an essential device that they are willing to use to overcome their hospital’s lack of health information technologies and human resources. This paper presents policy recommendations based on mixed-methods research on nurses’ use of smartphones for clinical work in the Philippines [16,20,21]. Collectively, these recommendations can be used as a basis to create or revise policies that govern the use of mobile devices in hospital settings in the Philippines and other developing countries. These can also guide healthcare organizations that wanted to support their healthcare staff as they use smartphones, whether it is hospital-owned or personally owned, to facilitate patient care. Based on the results of this research in the context of the Philippines, hospitals that do not provide nurses with adequate technologies can support nurses in their work by creating policies that would explicitly regulate smartphone use for work purposes.

Although these recommendations might not be ideal considering that smartphone use also presents certain drawbacks (i.e., a tendency for non-work-related use and patient misinterpretation), a pragmatic decision to allow nurses to use it for communication and information seeking purposes might help enhance the quality of care rendered to patients and nurses’ work productivity. Nonetheless, hospitals should consider these recommendations as a temporary solution, and they should strive to come up with a long-term solution of providing nurses with appropriate technologies that can reduce nurses’ reliance on their own smartphones. Until this happens, it will be inevitable for nurses to avoid using their smartphones for work purposes considering that they have the necessary skills to use it for facilitating work and improving the quality of care rendered to patients.

### Conflict of interest

None.

### Ethical approval

The mixed-method research described in this paper was approved by the IRB of Nanyang Technological University (IRB-2016-09-003).

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### Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.ijmedinf.2020.104250.

### References


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<tr>
<th>Key research findings</th>
<th>Recommendation 4: Educate nurses on the implications of using smartphones at work</th>
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<tr>
<td>Nurses’ use of smartphones for work purposes is positively associated with perceived quality of care and perceived work productivity (survey).</td>
<td>Hospitals should provide educational sessions to highlight the implications of using smartphones at work and as an opportunity to obtain relevant feedback on-to-be-implemented policies regarding smartphone use at work.</td>
</tr>
<tr>
<td>Nurses’ use of smartphone for non-work purposes is negatively associated with perceived quality of care and perceived work productivity (survey).</td>
<td>Educational sessions should be conducted to discuss do's and don'ts of smartphone use at work.</td>
</tr>
<tr>
<td>Nurses use smartphones for non-work purposes (survey and focus groups).</td>
<td>Aside from holding face-to-face educational sessions, infographics can also be used as a medium to convey relevant information regarding smartphone use at work.</td>
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Fig. 4. Key research findings and recommendation 4.


