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Original article

Factors influencing nursing students' participatory behaviour during COVID-19

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ABSTRACT

Background: Because nursing students are important human resources for future public health, their participatory behaviours related to preventive health during a pandemic were explored.
Aim: This study examines the impact of nursing students' risk communication, anxiety, and their perception of risk on their participatory behaviour during COVID-19.
Methods: Data were collected from 180 South Korean nursing students in six provinces via an online survey and were analysed using independent t-test, ANOVA, Pearson's correlation coefficient, and multiple regression. The SPSS WIN 25.0 program was employed.
Findings: Perceiving information to influence oneself was a significant predictor of each participatory behaviour. Risk communication was not identified as a factor influencing health-related participatory behaviour. However, the influence of information is a concept derived from risk communication.
Discussion: Risk communication for behaviour change needs to be designed so that communication targets recognise the impact of risk. Promoting pro-social behaviour in the nursing curriculum is important because it will make the students more sensitive to information that can have a dangerous impact on others.
Conclusion: It is important to create health-related risk communications by considering the perspective of perception of influence.

Summary of relevance

Problem or issue
There are few studies on COVID-19-related behavioural patterns of nursing students.
What is already known
In some cases, fear-inducing messages are used to ensure public preventive health behaviour.
What this paper adds
Perceiving information to influence oneself affected each kind of participatory behaviour among nursing students. Risk communication, anxiety, and perception of influence of information on others were not identified as factors influencing health-related participatory behaviour.

1. Introduction

The South Korean government has shared real-time risk communication so that the public can actively participate in preventive health activities in response to the highly contagious viral disease COVID-19. Systems in many areas of Korea have changed, and nursing education also faces new challenges. Lectures are mostly non-face-to-face, and clinical practice is also limited in part or in its entirety depending on hospital situations (Lee, 2021). Nursing students, as well as nurses, have close contact with patients, raising the risk of infectious diseases (Kim, Oh, & Lee, 2016). Nursing students may be more vulnerable to infection because they are less skilled than nurses (Jeong, 2015). Nevertheless, few studies have identified factors influencing nursing college students' participation in preventive health behaviours in ongoing pandemic condition.

Future nursing education is important to foster nurses who can cope with prolonged or new pandemics. Above all, this can be achieved through curriculum design that reflects students' characteristics (Kim, 2019). Therefore, this study has attempted to understand the effects of risk communication, anxiety, and information impact recognition on participatory behaviours such as pre-

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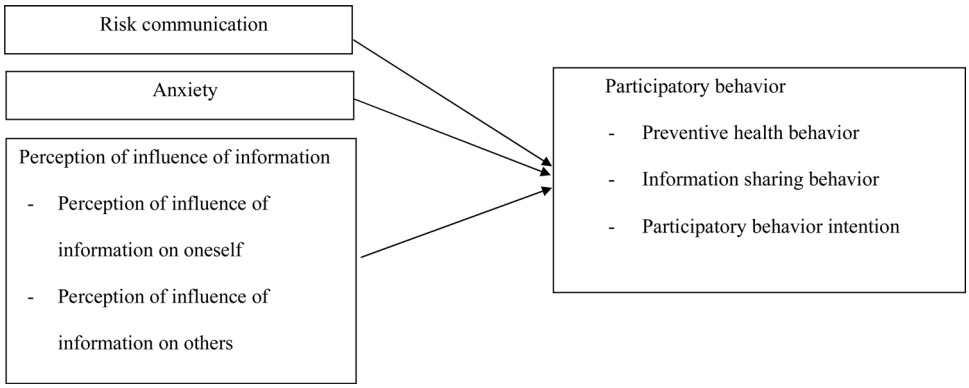

Fig. 1. Conceptual map of the study.

ventive health behaviours in nursing students in pandemic situations (Fig. 1).

2. Background/literature

In a highly contagious pandemic, it is very important for the public to participate in public health principles. The principles emphasised by the South Korean government include wearing masks, washing hands and avoiding public places and so on (Chang & Shim, 2013; Lee & You, 2020). In addition, sharing health information can be considered to be a participatory behaviour in public health because it is intended to protect oneself and others (Park, Kim, & Yang, 2016). Accordingly, in this study, individuals' preventive health behaviours, information sharing, and intentions to participate in public health guidelines were defined as participatory behaviours, one of pro-social behaviours.

Meanwhile, the South Korean government has used risk communication mainly through mass media or social network systems to resolve the pandemic by inducing public participation (Chang & Shim, 2013; Lee & You, 2020). Risk communication is the process of providing information to the public during natural disasters or other uncertainties (Sheppard, Janoske, & Liu, 2012; Sopory et al., 2019; Spiegelhalter & Gage, 2015). This risk communication has expanded to epidemic issues, highlighting its role in public health (Infanti, Sixsmith, & Barry, 2013). A risk communication approach that appeals to public fear is often used to inspire the public to undertake protective activities (Witte & Allen, 2000). However, the dissemination of risk-related information must be combined with a well established strategy to protect the public from risks (Janssen, Ruiter, & Waters, 2018; Peters, Ruiter, & Kok, 2013).

Sometimes campaign messages have different consequences from their original intentions because message acceptance relies on the psychological and cognitive processing of the recipient beyond the message producer's control (Cho & Salmon, 2007; Kim & Yoon, 2010). People behave differently depending on the perception bias of information acquired (Davison, 1983), which can be called "perception of the influence of information" (Park et al., 2016). That is, people tend to have different participatory behaviours depending on their beliefs or attitudes, or whether the risk communication-related issues affect themselves or third parties (Chang & Shim, 2013; Lang & Yegiyan, 2008; Shen & Dillard, 2007). Especially, the public tends to accept that socially undesirable messages will have a greater influence on third parties (Andsager & White, 2007), and that desirable messages will have a greater impact on themselves (Hoorens & Ruiter, 1996; Perloff, 1999). However, since the latter findings were somewhat inconsistent (Golan & Day, 2008), and as a clue to understanding the public (Dillard & Peck, 2000; Kim, 2019), it is necessary to clarify the emotions and perceptions associated with their risk responses.

Previous COVID-19-related studies dealt with psychological issues, such as depression, anxiety, and stress among health care workers; scarcity of health care workers or mainly focused on health care workers during pandemics (Bohlken, Schömig, Lemke, Pumberger, & Riedel-Heller, 2020). Prior studies on risk communication focused primarily on infectious disease-related emergencies, as shown in a systematic literature review study, Miller et al. (2017), which suggested that risk communication strategies for health-related professionals should focus on designing messages for specific audience needs via synthesised findings. However, few studies examined the relationship between a pandemic and risk communication or participatory behavior. Specifically, in case of a prolonged pandemic, nursing students must take additional interest in their growth as they will eventually become an integral part of the healthcare manpower (Kim et al., 2016).

3. Methodology

3. 1. Study design, setting, and sample

This was a cross-sectional online survey. A total of 180 Bachelor of Nursing students were invited from the Seoul, Gyeonggi-do, Gangwon-do, Chungcheong-do, Gyeongsang-do, and Jeonra-do provinces. The selection criteria for the subjects were nursing students who had online access, and those who were taking a leave of absence or had already graduated were excluded. We determined that a sample size of 210 was required to detect a statistically significant medium effect in a multiple regression model with 14 predictors at a 0.05 significance level. Power analysis was conducted using G* power version 3.1.3 (Institute for Experimental Psychology, Heinrich-Heine University, Dusseldorf, Germany).

3.2. Ethics

The Institutional Review Board of the author's University approved this study. The study's purpose was explained to participants, and they were assured that their personal identification information will remain confidential. They were free to withdraw from the study any time, without penalty.

3.3. Study instruments

3.3.1. Demographic characteristics

Participants were asked to disclose their demographic and communication-related characteristics, including age, gender, school year, satisfaction with major, duration of clinical prac-

tice experience, respiratory system disease prevention education experience, and area of residence.

3.3.2. Risk communication

We used the seven-item scale developed by Sung (2014) to evaluate the risk communication awareness about Avian Influenza (AI) infection and radiation waste issues. The contents of AI infection and radioactive waste were modified to adapt to COVID-19 ("I think the COVID-19 risk communication so far has had a good overall outcome"). Questionnaires were adopted through the content validity of five experts and consisted of three sub-domains: organisational, public, and communication levels. Each item used a five-point Likert scale (5 = "not at all"; 1 = "strongly agree"–meaning that the perception of risk communication is higher). Cronbach's alpha was 0.91 in the study by Sung (2014) and 0.89 in this study.

3.3.3. Anxiety

The Korean version of the anxiety tool developed by Spielberger, Gorsuch, and Lushene (1970) and translated by Kim and Shin (1978) was used. This comprised 20 questions and used a four-point Likert scale (from 1 = "not at all" to 4 = "always"). The higher the score, the higher the anxiety. Cronbach's alpha was 0.72 in the study by Kim et al. (2016) and 0.89 in this study.

3.3.4. Perception of influence of information

Perception of influence of information refers to the extent to which perception of oneself and others is affected by risk information (Park et al., 2016). We used the six-item scale developed by Park et al. (2016) to evaluate the perception of influence of information related to MERS. The content was modified to adapt to COVID-19 using the content validity of five experts. There were six items consisting of two subdomains: the influence of information on oneself and the influence of information on others ("Information about COVID-19 has influenced my (others') thoughts on the threat of COVID-19″). A seven-point Likert scale was employed. Higher scores reflected higher perception of influence. The domain with a high perception score of influence was more dominant. Thus, if the perception of influence on oneself reflects a higher score than the influence on others, the risk information would affect the individual more significantly than it would affect others. Cronbach's alpha was 0.90 and 0.84 in the study by Park et al. (2016) and 0.84 and 0.85 in this study.

3.3.5. Participatory behaviour

Participatory behaviour in this study is a collective term for three concepts attempted to investigate the level of participation in public health activities related to COVID 19: Preventive health behaviour, information sharing behaviour, and participatory behaviour intentions. Tools to measure three concepts are as follows.

Preventive health behaviour employed tools developed by Park et al. (2016). A total of seven questions regarding behaviour, such as washing one's hands more often than usual and the use of hand sanitiser/disinfectant. Response options were configured to allow answers to the proposed behaviour in the "yes" or "no" form. The number of affirmative answers was summed. The higher the number, the higher the preventive behaviour. Kuder–Richardson Formula 20 was 0.70 in this study.

Information sharing behaviour was measured using a single question used by Park et al. (2016): "how often have you been sharing or communicating news and information about COVID-19 with others?" (This communication included conversations, phone calls, texts, e-mails, link sharing, scrapping, tweeting/retweeting, and more.) A five-point Likert scale was employed with options ranging from 1 ("not at all") to 5 ("very frequently"). The higher the score, the higher the information sharing behaviour.

Participatory behaviour intention was measured using five questions developed by Sung (2014). The contents therein were modified to adapt to COVID-19 using the content validity of five experts. This comprised five questions and used a five-point Likert scale with options ranging from 1 ("not at all") to 5 ("strongly agree"). The higher the score, the higher the participatory behaviour intention. Cronbach's alpha was 0.78 in the study by Sung (2014) and 0.76 in this study.

3.4. Data collection

From April 16 to 30, 2020, Data were collected using online surveys (www.surveymonkey.com), a safety measure to limit the risk of COVID-19 transmission. Three trained research assistants recruited survey participants to the nursing student's online community. A link to the questionnaire was sent via mobile phone or e-mail to those who provided prior consent to participate. The collected data was processed to make it impossible to identify personal information. The coded data was stored on the author's computer and could only be accessed using a password.

3.5. Statistical analysis

Data were analysed using the SPSS version 25.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to examine participants' sociodemographic characteristics. Independent t-tests and one-way ANOVA were used to examine the differences in the means of preventive health behaviour, information sharing behaviour, and participatory behaviour intention according to participants' general characteristics. The Scheffe test was performed as a post-comparison tool, and correlation between the main variables was determined using the Pearson's correlation coefficient. Multiple linear regression analysis (Enter method) was adopted to identify predictors of preventive health behaviour, information sharing behaviour, and participatory behaviour intention. Using the P-P Chart and histogram analysis, the assumption of normal distribution for multiple linear regression analysis was verified and met. To evaluate multicollinearity, the variance inflation factor was assessed and the acceptable level was met. Dummy variables were created for categorical variables. Statistical significance was established at $p < .05$, and all tests were two-tailed.

4. Results

Out of 210 completed questionnaires, 30 were excluded due to incomplete information; data from 180 were analysed.

Table 1 shows the demographic characteristics of the participants and differences in participatory behaviours according to sociodemographic characteristics. Most participants (94.4%) were female, and the mean age was 21.1 years. The preventive health behaviour score was higher for the female group ($p < .001$).

Table 2 shows the frequency of preventive health behaviour and the mean scores of every variable. The highest score was for "I wear a face mask when I go out" at 98.3%. The lowest scoring item was "I avoid the use of public transportation" at 63.9%. The mean scores of risk communication, anxiety, perception of influence of information (self and others), and participatory behaviour (preventive health behaviour, information sharing behaviour, and participatory behaviour intention) were 3.78 (out of 5), 2.25 (out of 4), 5.78, 5.81 (out of 7), 6.22 (out of 7), 3.31 (out of 5), and 3.84 (out of 5) points, respectively. Finally, regarding the perception of influence, the difference between the score of perceived influence on oneself and the influence of perceived score on others was -0.03,

Table 1
Differences in participatory behaviour by demographic characteristics (n = 180).

Variables	Categories	n (%) or mean± SD	Preventive health behaviour		Information sharing behaviour		Participatory behaviour intention	
			mean (SD)	t/F *p*	mean (SD)	t/F *p*	mean (SD)	t/F *p*
Age (In years)		21.1 ± 2.1						
Gender	Male	10 (5.6)	5.20 ± 1.03	-3.59 <.00[a]	2.90 ± 1.20	-1.50 .137	3.62 ± 0.60	-1.26 .210
	Female	170 (94.4)	6.28 ± 0.92		3.34 ± 0.87		3.85 ± 0.56	
Year (school)	1	19 (10.6)	6.37 ± 0.90	.86 .464	3.05 ± 1.03	1.17 .324	3.60 ± 0.57	2.53 .059
	2	39 (21.7)	6.31 ± 0.92		3.31 ± 0.86		3.76 ± 0.56	
	3	49 (27.2)	6.04 ± 1.08		3.22 ± 0.87		3.81 ± 0.55	
	4	73 (40.6)	6.25 ± 0.89		3.44 ± 0.90		3.95 ± 0.55	
Satisfaction with major	None	19 (10.6)	6.37 ± 0.90	.97 .409	3.05 ± 1.03	2.39 .071	3.60±0.57	2.68 .049[b]
	Low	5 (2.8)	5.60 ± 0.55		3.20 ± 0.84		3.64 ± 0.82	
	Moderate	80 (44.4)	6.18 ± 0.96		3.51 ± 0.87		3.95 ± 0.57	
	High	76 (42.2)	6.26 ± 0.97		3.51 ± 0.87		3.95 ± 0.57	
Duration of clinical practice (yrs.)	None	99 (55.0)	6.20 ± 0.97	.05 .952	3.23 ± 0.92	1.02 .364	3.75 ± 0.56	2.95 .055
	< 1	25 (13.9)	6.20 ± 1.15		3.32 ± 0,85		3.86 ± 0.47	
	1≤-< 2	56 (31.1)	6.25 ± 0.84		3.45 ± 0.89		3.98 ± 0.57	
Engage in learning for infection prevention	None	64 (35.6)	6.27 ± 0.93	.51 .610	3.16 ± 0.98	-1.73 .086	3.73 ± 0.58	-1.93 .055
	Yes	116 (64.4)	6.19 ± 0.97		3.40 ± 0.84		3.89 ± 0.54	
Major residential areas in the last 3 months	Seoul- Kyeonggi	43 (23.9)	6.20 ± 0.99	.78 .566	3.35 ± 0.92	.59 .712	3.90 ± 0.63	.31 .906
	Chungcheong	59 (32.8)	6.25 ± 0.99		3.19 ± 0.90		3.78 ± 0.55	
	Gwanwon	21 (11.7)	5.95 ± 1.02		3.24 ± 0.89		3.82 ± 0.49	
	Gyeongsang	27 (15.0)	6.41 ± 0.57		3.37 ± 0.88		3.88 ± 0.49	
	Jeonra	16 (8.9)	6.00 ± 1.15		3.44 ± 0.96		3.88 ± 0.66	
	Others	14 (7.7)	6.36 ± 0.93		3.57 ± 0.85		3.77 ± 0.54	

[a] $p < .001$,
[b] $p < .05$.

Table 2
Frequency of preventive health behaviour and levels of major variables (n = 180).

Items	% of yes	Mean	SD
I go out less frequently	91.3		
I wear a mask when I go out	98.3		
I wash hands more often than usual	97.2		
I use hand sanitiser/disinfectant in public places	92.8		
I avoid people with cough	85.0		
I avoid visiting public places, such as restaurants and theatres	92.8		
I avoid using public transportation, such as buses and subway	63.9		
Total	88.8		
Variables			
Risk communication		3.78	0.65
Anxiety		2.25	0.47
Perception of influence of information on oneself (1)		5.78	0.82
Perception of influence of information on others (2)		5.81	0.90
The predominance of perception of influence of information (1-2)		-0.03	0.95
Participatory behaviour (preventive health behaviour)		6.22	0.95
Participatory behaviour (information sharing behaviour)		3.31	0.90
Participatory behaviour (participative behaviour intention)		3.84	0.56

indicating that the pandemic would affect others a little more than the self.

Table 3 shows the relationships between risk communication, anxiety, perception of influence of information, and participatory behaviour (preventive health behaviour, information sharing behaviour, and participatory behaviour intention). The anxiety level was negatively correlated to perceiving information to influence oneself ($p = .002$) and preventive health behaviour ($p = .025$). Perceiving information to influence oneself was positively correlated to perceiving information to influence others ($p < .001$), preventive health behaviour ($p = .003$), information sharing behaviour ($p < .001$), and participatory behaviour intention ($p < .001$). Perceiving information to influence others was positively correlated to information sharing behaviour ($p = .008$) and participatory behaviour intention ($p = .031$). Preventive health behaviour was positively correlated to information sharing behaviour ($p < .001$) and participatory behaviour intention ($p < .001$). Information sharing behaviour was positively correlated to participatory behaviour intention ($p < .001$).

To determine the impact of participants' risk of communication, anxiety, and perception of influence of information on participatory behaviour in relation to COVID-19, we performed a stepwise multiple regression Table 4. shows the results.

Perceiving information to influence oneself ($\beta = .22$, $p = .003$) was a significant factor for preventive behaviour under participatory behaviour. The influence of information on oneself explained 6.0% of preventive health behaviour under participatory behaviour. This was identified as the only influencing factor on information sharing behaviour and participatory behaviour intention at 9% and 15%, respectively.

5. Discussion

The purpose of this study was to investigate the factors influencing nursing students' participatory behaviour in COVID-19. Specially, we examined the association between risk communication, anxiety, perception of influence of information, and participatory behaviour.

Table 3
Correlation between risk communication, anxiety, perception of influence of information, and participatory behaviour (n = 180).

Variables	1 r / *p*	2	3	4	5	6
Anxiety 2	.06 .437					
Perception of influence of information on oneself 3	.13 .097	-.23 .002[b]				
Perception of influence of information on others 4	.04 .603	-.12 .109	.58 <.001[a]			
Participatory behaviour (preventive health behaviour) 5	.05 .471	-.17 .025[b]	.22 .003[b]	.07 .384		
Participatory behaviour (information sharing behaviour) 6	.01 .958	-.11 .134	.30 <.001[a]	.20 .008[b]	.25 .001[b]	
Participatory behaviour (participatory behaviour intention) 7	.13 .093	-.09 .215	.39 <.001[a]	.16 .031[b]	.30 <.001[a]	.49 <.001[a]

[a] $p < .001$,
[b] $p < .05$.

Table 4
Results of multiple regression (n = 180).

	Variables	B	SE	β	t	*p*	
Preventive health behaviour	Constant	1.33	0.71		18.66	<.001	$R^2 = .06$ Adj. $R^2 = .06$ F = 9.34 p =.003
	Perception of influence of information on oneself	0.04	0.01	.22	3.06	.003	
Information sharing behaviour	Constant	1.40	0.46		3.05	.003	$R^2 = .09$ Adj. $R^2 = .09$ F = 17.65 p <.001
	Perception of influence of information on oneself	0.33	0.08	.30	4.20	<.001	
Participatory behaviour intention	Constant	2.29	0.28		7.03	<.001	$R^2 = .15$Adj. $R^2 = .15$ F = 31.93 p <.001
	Perception of influence of information on oneself	0.27	0.05	.39	5.65	<.001	

Preventive health behaviour and information sharing behaviour levels of this study were higher compared to the aforementioned study related to MERS in Korea (Park et al., 2016). The score of participatory behaviour intention was also higher than participatory behaviour intention related to AI and radioactive waste in Sung's study (2014). The average frequency of seven items in this study was higher than another Korean study (Park et al., 2016) on MERS but lower than a previous study (Taghrir, Borazjani, & Shiraly, 2020) related to COVID-19 involving Iranian medical students. "Behaviors pertaining to avoiding public transportation and efforts to avoid people with a cough" were more frequent than Park et al. (2016), but lower compared to Taghrir et al. (2020). "Wearing a face mask" was the most common preventive health behaviour in this study, scoring much higher than the MERS outbreak (Park et al., 2016). The difference in preventive health behaviour of subjects may result from difference of culture, and characteristics of risk communication provided. Though risk communication is essential for public health campaigns (Vos et al., 2018), the ways it is applied may vary from country to country and situation to situation. The frequency of participation in preventive health behaviour of the subjects in this study was also relatively higher in the items emphasised by risk communication. In other words, even if risk communication does not predict preventive health behaviour statistically significantly in this study, it is necessary to explore the effects of risk communication in various environments.

There was no statistically significant difference in the level of participatory activities among the subjects of this study, but contrary to expectations, the score of preventive health behaviour was higher in freshmen. Participants in previous studies answered that the sources of information related to COVID-19 were mainly official advice from the mass media rather than school education (Taghrir et al., 2020; Yuan, Liu, Li, & Liu, 2020). It is inferred that there was little effect by school education. In the study in which knowledge, practice, attitude, and e-health literacy were identified as predictors of preventive behaviour of Chinese nursing students, the level of freshmen was higher than that of seniors in other factors except knowledge (Yuan et al., 2020). The public is known to be more compliant with official advice when anxiety grows due to ignorance of novel threats (Rubin, Amlôt, Page, & Wessely, 2009). In other words, it is possible that freshmen perceived their lack of disease-related knowledge and responded more sensitively to risk communication emphasising preventive actions.

However, COVID-19 is a public health emergency that threatens routine capabilities in the international community (Lee & You, 2020). The emergence of public health emergencies such as COVID-19 will be repeated for mankind. Therefore, the nursing curriculum should consider fostering human resources who can prevent and manage public health emergencies.

Another interesting outcome was that risk communication did not correlate to any participatory behaviour. Anxiety had a significant negative correlation only in preventive behaviour. Iranian medical students' risk perception was similar to the result of negative correlation with preventive behaviour, and it differed from previous studies (Rubin et al., 2009; Song & Kim, 2017; Lim et al., 2020). Found that public behaviour and anxiety level toward COVID-19 can be changed as they receive sufficient information to control the spread of the infection. These may aid the impact of risk communication campaigns by demonstrating that, while COVID-19 is highly contagious, it can be controlled through preventive behaviour. In other words, continuing to provide risk communication to the public would be desirable from a long-term perspective because it helps their psychological stability.

Most importantly, the study indicated that perceiving information to influence oneself was the only predictor of preventive health behaviour, information sharing behaviour, and participatory behaviour intention. These results differ from studies that suggest that the level of risk communication or anxiety predicts MERS-related participatory behaviour (Kim et al., 2016; Park et al., 2016). Rather, it is a similar context to studies that risk perception affects COVID-19-related participatory behaviour (Lee & You, 2020) and changes in participatory behaviour related to swine flu (Rubin et al., 2009). However, the concept of perception in these studies does not distinguish in detail, so additional investigation is required for comparison.

The finding of the study predicted that the more subjects perceive that COVID-19 has a greater impact on themselves, the more participatory behaviour will increase. COVID-19-related risk communication produced in Korea is classified as a public interest message to overcome the pandemic by promoting preventive health behaviour of the public (Holmes, 2008; Perloff, 1999) stated that the public has a bias that, when evaluating the impact of a message, if it is a message of public interest, it will have a greater effect on them than others. Strategies for establishing effective risk communication will need to begin with identifying context or mechanisms between them.

A key takeway from this study is that Korea's adequate management of COVID-19 risk communication mitigated nursing students' anxiety and facilitated the adoption of preventive behaviour. Finally, when risk communication demonstrates the seriousness of the disease and its potential effect on the self, it can be the most impactful regarding behavioural changes. In a pandemic situation, preventive health behaviour for oneself is also a pro-social behaviour that indirectly helps others. In addition, factors that threaten the health of others eventually affect one's own safety. Therefore, nursing students should not only actively participate in preventive health behaviours that protect themselves, but also pay attention to issues that affect the health of others. The nursing education should also be prepared to cope with the pandemic situation with a macroscopic perspective.

5.1. Limitations

This study has several limitations. First, convenience sampling was used to recruit nursing students from six Korean provinces. Though the varied locations made the study more representative of the country, the generalisability to other countries or populations might be limited, particularly those with a different value system such as the United States where the culture is one of individualism.

Second, data were collected through cross-sectional design during a 2-week period in April 2020. Consequently, we could not explore the relationship between time and risk communication, anxiety, perceived influence, and preventive behaviour. Moreover, the passage of time has implications for COVID-19 phases, and this may suggest that the confounding variables of this study have not been fully considered. Finally, although acceptable instruments were employed to measure study variables, the generalisation of the findings needs to be prudent due to the biased self-reporting and use of multiple instruments primarily adopted in Korea. Therefore, repeated research using more sophisticated and detailed tools for populations in various environments is necessary.

6. Conclusion

Our findings indicated that the perception that information that applies to oneself could be crucial in encouraging the public to engage in prosocial behaviours that helps control pandemics. We recommend that the perspective of the perception of influence must be reflected in the creation of risk communication that encourages people's participatory behaviour.

Authorship contribution statement

Woo CH: Conceptualisation and Methodology, Data curation, Formal analysis, Funding acquisition, Investigation, Project administration, Supervision, Roles/Writing - original draft, Writing - review & editing. Park JY: Data curation, Formal analysis, Investigation, Validation, Visualisation, Roles/Writing - original draft, Writing - review & editing. Joe SY: Resources, Software, Roles/Writing - original draft, Writing - review & editing.

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Ethical statement

This study was approved by the ethics committee of Konyang University's Institutional Review Board (Approval No: KYU-2020-042-02; Date of approval: 22 April, 2020). Informed consent was obtained from each participant.

Conflict of interest

The authors state they have no conflict of interest to declare.

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