

Research Article

Sense of Belonging and the Use of Social Digital Communication Platform: Nursing Staff Comparison between Pre and During COVID-19

Weil-Lotan D, Ilsar T and Benbenishty J*

Nursing Administration, Hadassah Hebrew University Medical Center, Jerusalem Israel

***Corresponding author:** Julie Benbenishty, Nursing Administration, Hadassah Hebrew University Medical Center, PO-Box 12000 Ein Kerem, Jerusalem Israel**Received:** July 05, 2021; **Accepted:** August 10, 2021;**Published:** August 17, 2021**Abstract**

In recent years use of digital social networks in the workplace has become the popular mode of team communications. The widespread use of different methods of interpersonal interaction and the availability of the user at any time and in any place have made the boundaries between the personal space and the professional space distorted.

Aim: To investigate nurses' perceptions of the use of digital application communication, level of belonging and stress before and during COVID-19 pandemic.

Design: Quasi-experimental, prospective convenience sample correlational study.

Method: Team cohesiveness, level of Belongingness and demographic questionnaire was distributed to five hospital departments in pre and during COVID-19 pandemic.

Results: A total 178 nurses (83.3% females), average age 34.40 y/o; a significant positive correlation found between nurse seniority and level belongingness ($\beta=.28$, $p<.01$). Significant differences were found between during COVID-19 and pre-pandemic group in using digital platform for solving professional problems ($\chi^2 (1) = 7.74$, $p<.01$). In addition, the more the respondents perceived the content of the digital application group for sharing personal experiences the greater their sense of belonging ($\beta = .19$, $p=.03$).

Conclusion: This study examines nurses' digital communication and sharing, deliberation, team cohesiveness and information exchange. The results demonstrate nurses' interpersonal professional relationships expressed in this digital application as well comparison between two periods. The period of "normal" activity and during pandemic.

Introduction

The phenomenon we are investigating is nurse communication *via* digital social network instant messages using WhatsApp- does it promote a sense of team belongingness?

Literature review

Digital social network communication consist of parcels of information and message devices, providing multiple communication passages for information exchange and knowledge transfer. This type of communication has become popular in recent years among smartphone owners. People who use social media are not just seeking and sharing information, they perceive this media as a platform to meet friends, acquire a sense of belongingness and to develop relationships with other people [1]. Findings from Cao et al [1] empirical study indicated that social media enhanced knowledge transfer by fostering trust among employees, thus leading to better work performance. The widespread use of different digital application social network for interpersonal interaction and the availability of the user at any time and in any place have made the boundaries between

the personal space and the occupational space distorted. Employees and managers can be reached at any time and place. The specific digital application, "WhatsApp", is characterized by the formation of common groups for a wide variety of needs. Used as a workplace communication platform these non-anonymous groups usually have an additional interaction in addition to the interaction through the App [2]. The use of WhatsApp in the workplace for communication has become very popular in recent years and in fact many groups in occupational settings use WhatsApp group for employees to convey various messages and knowledge transfer [3,4]. Communication between employees and managers and among employees is of great importance to improve work processes. Often such message transfer replaces face-to-face communication and facilitates work processes including updates on new procedures, activating employees and managing various tasks [5]. A study conducted in China examining the use of WhatsApp in the workplace found that although use was found to interfere with the course of work, the work outcomes and task accomplishments did not decrease and some even improved. The current study highlights the importance of using WhatsApp messages as organizational improvements and performance quality [6].

Belonging to a group in a nursing staff

A sense of belonging is defined as an experience of personal involvement in the system or environment, so that people feel they are an integral part of that system or environment. The “sense of belonging” is the basic need of every person on the personal and occupational level [7].

A study that examined 1,296 nursing students regarding the relationship between a sense of belonging to a group and stress indicated that sense of belonging has a positive influence on nurses learning, motivation and confidence and a negative relationship with perceived stress/ The stronger a person feels connected to and identifies with organizational goals, the less stress student nurses experience [8].

Tajfel & Turner’s Social Identity Theory, 1979 argues that an individual’s self-esteem is related to his or her belonging group appreciation, thus creating an individual’s tendency to perceive his or her group as distinct from other groups and better [9].

Nurses’ stress levels

Stress at work in the nursing profession has been researched extensively over the years and many articles have been published describing the reasons for stress and ways to deal with it [10-12].

A cross-sectional study of 300 hospital nurses examining the causes of stress among nurses found a number of major causes of stress: workload was rated as the main source followed by staff shortages and lack of time to perform tasks [12]. Another study conducted in Australia examined nurses and doctors in a hospital emergency room found similar causes of stress among staff, staff reported moderate levels of stress and self-fulfillment. Nurses and physicians reported similar perceptions about the work environment, although nurses reported higher median levels of workload. The team rated patient death or child sexual abuse as the most stressful, followed by workplace violence and workload [13].

A Hong Kong study examining the relationship between using the Internet *via* a cell phone indicates an increase in the level of “happiness” depending on the amount of use of the cellular Internet tool (email, Facebook and WhatsApp).

In a Finnish study testing the theory that belonging to a group may reduce stress and improve psychological well-being and life satisfaction through improving social support. People who saw themselves as having a high identity with their workplace group had lower stress indicators and reported higher social support And less work burnout [14].

A Turkish study found 477 undergraduate students at a public university in Turkey. The study findings demonstrated that college students who have high college sense of belonging had less perceived stress and more life satisfaction [15].

The use of the WhatsApp digital communication application enables a sense of belonging to a virtual group. The question arises who is interested in participating in the group and whether the involvement, even if it is a “silent” participation without sending messages but only observation, affects the stress level of the group member [16].

There are several theoretical models that hypothesize about the relationship between social support and psychological well-being indicators.

According to Hasalems’ 2005 model, identification with a group (family, friends, and co-workers) is associated with a higher perception of social support and reduces stress. The model was tested in two studies of population undergoing extreme stress. One examined patients recovering from heart surgery and their level of psychological well-being in accordance with social support and sense of belonging to family and friends. The second study examined employees who experienced stress in the workplace and the relationship to workplace belonging and psychological well-being. Both studies found a strong positive relationship between social identity and social support and personal/professional high wellbeing. In addition, a strong negative relationship was found between social identification and stress. Both studies found that social support is a significant mediator in reducing stress levels [17].

COVID-19 pandemic

The COVID-19 pandemic created an atmosphere in which communication within health care team became challenging. Many health systems developed new COVID-19 departments and intensive care units using staff from various other departments, having no prior training, orientation period or team building time. Nurses, junior and senior physicians were collected in an eclectic fashion to fill the expanding gap between resources and patients’ need. Not only were team members strangers to each other, knowledge levels, educational backgrounds and skill sets wide-ranged. In addition, use of Personal Protective Equipment (PPE) added to communication barriers. All these factors amplified the need to create a team digital communication pathway. There is a lack of published studies exploring nurse teams’ perception of a digital application as a communication platform in an acute care setting.

This study investigates nurses’ perceptions of the use of digital application communication, a sense of belonging and stress before and during COVID-19 pandemic.

Design

Quasi-experimental, prospective convenience sample two phase study

Method

The first phase of the study was conducted in 2013. Five head nurses were contacted from three internal medicine wards (A, B, C) and one maternity ward and emergency department. The head nurses distributed the questionnaire among the nursing staffs using the individual department WhatsApp group. The questionnaire was distributed to a total sample of the five participating departments including 170 nurses. After a week, another request was made and the questionnaire was distributed again focused on those not answering the initial request. The final count total of returned completed questionnaires was 118/178 which accounts for 70% response rate. At this point, the Internet questionnaire closed.

In 2021 data were collected for nursing staff working in departments solely caring for COVID-19 patients during the first wave (March 25-May 1, 2020). The nurses at this time worked

in the corona wards for between a week and three months. The principle investigator approached the head nurses in five COVID-19 departments. The number of nurses in all the wards was 103 nurses, however here due to a situation of instability in periods of time working in COVID-19 department, it is not possible to accurately know the precise number of nurses belonging to each department WhatsApp group. In total, 42 nurses answered the second round of questionnaire distribution. The questionnaires were distributed to the nursing staff in the same manner as pre-COVID-19 participation recruitment.

The questionnaire required approximately 10 minutes to complete. Participants were able to discontinue their participation part way through the questionnaire if they so desired. Submission of the online questionnaire was taken to imply consent. Each questionnaire was numerically coded for data entry purposes. No identifying personal information was recorded on the questionnaires. The investigators used the Somers' Belongingness questionnaire to measure level of belonging. The Somers' Belongingness Scale (BES) [18] is a 140 item questionnaire which was modified by Levett-Jones in 2007. The modified questionnaire totals 34-item self-report instrument designed to measure level of belongingness specific to the clinical placement environment.

The 2008 modified BES was used in the current study [19].

The modified BES—like the original BES, assesses feelings, cognitions and behaviors. The items reflect the two components indicated in Somers' definition of belongingness, connectedness (being part of, feeling accepted, and fitting in), and esteem (being cared about, valued and respected by others). Items also reflect active and passive interactions, that is, what the individual receives or perceives that they receive from others, as well as the actions they take to either enhance belongingness or in response to belongingness. Answer choices were based on frequency responses on a five-point Likert scale, with 1 = never true, 2 = rarely true, 3 = sometimes true, 4 = often true and 5 = always true.

Demographic questions were included as the first section of the BES online survey and age, gender, and years of nursing experience.

Reliability coefficients for the subscales were excellent, ranging from 0.94 to 0.97. Of significance to the current study is the .94 Cronbach's alpha for the subscale of work [19].

Data analysis

The data were analyzed using SPSS software version 25. Descriptive statistics were analyzed using means, standard deviations, and ranges for the continuous variables, and frequencies and percentages for the discrete variables. The differences between the study variables were assessed using independent samples t-tests for the continuous variables, and Chi-square tests for the categorical variables. The differences between the respondents' stress levels before and after the COVID-19 were assessed using paired t-tests. A multivariate model for predicting the belongings was assessed using linear regression. Statistical significance was considered for p-values smaller than 5%.

Findings

Description of sample: A total number of 178 nurses (83.3% females), average age of 34.40 y/o (SD = 9.10). Most of the respondents

Table 1: Means, standard deviations, ranges, frequencies, and percentages for the sample's demographic characteristics.

	M	SD	N	%
Age	34.4	9.1		
Gender				
• Male			27	16.7
• Female			135	83.3
Marital status				
• Married			88	55
• Single			62	38.8
• Divorced			7	4.4
• Widower			1	0.6
• Other			2	1.3
Seniority at the department	5.66	6.02		
Seniority as a nurse	8.81	9.53		

were married (55.0%) a third single (38.8%). The respondents worked average 5.66 years (SD = 6.02) in their pre-COVID-19 department and had on average 8.81 seniority years in their profession (SD = 9.53) (Table 1).

Analysis was preformed between 2 groups of study participants, nurses working in a COVID-19 department (CD) or a Non COVID-19 (NCD).

The differences between the participants' department demographic characteristics were assessed using independent samples t-tests for the continuous variables, and Chi-square tests for the categorical variables.

The age results show that the respondents who worked at the COVID-19 department (CD) (M = 39.44 years, SD = 8.73; CD) were older in comparison with the respondents who worked at the non COVID-19 department (NCD) (M = 32.66 years, SD = 8.59; MD), (t(158) = 4.34, p < .01). Moreover, the respondents who worked at the CD (M = 13.74, SD = 9.77) had more work experience in comparison with the respondents who worked at the NCD (M = 7.08, SD = 8.85), (t(156) = 4.03, p < .01). However, there was no difference between the respondents at the seniority years at the NCD (t(156) = 0.80, p = .42) (Table 2).

Descriptive Statistics of use of digital communications, a sense of belonging and stress: The differences between the participants regarding WhatsApp usage characteristics were assessed using independent samples t-tests for the continuous variables, and Chi-square tests for the categorical variables.

The results show a higher rate of respondents from the CD (97.6%) attributed the use of WhatsApp for the purpose of general updates, in comparison with the NCD (78.8%), ($\chi^2(1) = 7.90, p < .01$). Moreover, a higher rate of respondents from the CD (70.7%) attributed the use of WhatsApp for solving professional problems in comparison with the NCD (46.0%), ($\chi^2(1) = 7.74, p < .01$). In addition, the CD (M = 2.71, SD = 0.46) read higher number of text messages in comparison with the NCD (M = 2.50, SD = 0.60), (t(93) = 2.53, p = .03) (Table 3).

Table 2: Differences between the departments at the demographic characteristics.

	CD		NCD		t/χ ²	p
	MD (SD)	N (%)	M (SD)	N (%)		
Age	39.44 (8.73)		32.66 (8.59)		4.34	<.01
Gender					0.79	0.37
• Male		36 (87.8)		99 (81.8)		
• Female		5 (12.2)		22 (18.2)		
Marital status					1.58	0.21
• Married		26 (63.4)		62 (52.1)		
• Non married		15 (36.6)		57 (47.9)		
Seniority at the department	6.31 (5.59)		5.43 (6.18)		0.8	0.42
Seniority as a nurse	13.74 (9.77)		7.08 (8.85)		4.03	<.01

Note: CD=COVID-19 Department; NCD=non COVID-19 department.

Table 3: Differences between the departments at the WhatsApp usage.

	CD		NCD		t/χ ²	p
	MD (SD)	N (%)	MD (SD)	N (%)		
WhatsApp content						
Shift replacement		14 (34.1)		66 (48.2)	2.51	0.11
General updates		40 (97.6)		108 (78.8)	7.9	<.01
Experiences sharing		25 (61)		74 (54)	0.62	0.43
Professional problems solving		29 (70.7)		63 (46)	7.74	<.01
Personal experiences sharing		15 (36.6)		46 (33.6)	0.13	0.72
The number of text messages in a day	1.2 (0.56)		1.29 (0.61)		0.88	0.38
The number of reading in a day	2.71 (0.46)		2.5 (0.6)		2.53	0.03

Table 4: The factors which influence the belonging feeling during the COVID-19 period.

To which extent do the following factors influence your belonging feeling to the COVID-19 department	M	SD
The head nurse	4.66	0.66
The department's WhatsApp group	4.2	0.87
The feeling of recruiting at crisis time	4.63	0.62
The public and media support	4.68	0.96
The family support	3.66	1.13
The hospital's management support	3.65	1.29
The concern to the physical needs	4	1

Differences between the departments and study variables

For assessing the differences between the participants' stress and belongings levels, independent samples t-tests was used.

The results show the CD (M = 4.92, SD = 1.03) had higher level of belongingness, in comparison with the NCD (M = 4.09, SD = 1.37), (t(94) = 3.97, p<.01). In addition, the CD (M = 58.88, SD = 30.69) had greater stress levels in comparison with the NCD (M = 43.06, SD = 14.56), (t(46) = 3.13, p<.01).

Stress levels before and after the work at the COVID-19 department

For assessing the difference in the respondents' stress levels before and after they started to work at the CD, paired-samples t-tests were used.

Table 5: Standardized coefficients for predicting belongings.

	β	p
COVID-19 department	0.15	0.09
Seniority at the mother department	-0.12	0.18
Gender	-0.01	0.11
Marital status	0.28	0.91
Seniority as a nurse	-0.28	0.01
Shifts replacement	-0.11	<.01
General updates	-0.06	0.17
Experiences sharing	0.15	0.48
Professional problem solving	0.19	0.06
Personal experiences sharing	0.1	0.03
Texting	0.1	0.23
Reading	0.09	0.25
Stress levels at the first three shifts	0.02	0.81

The results show that the respondents had greater stress levels before they started to work at the CD (M = 63.63, SD = 30.00) in comparison with the last three shift at the CD (M = 28.00, SD = 25.11), (t(39) = 7.61, p<.01).

The description of the factors, which influence the sense of belonging to the team during COVID-19 period

The respondents were asked to indicate on a Likert scale ranging from 1-5, "In what extent the following factors influence the feeling

of belonging to the COVID-19 WhatsApp group?" The factors were the head nurse, which department (CD or NCD) WhatsApp group, the feeling of being recruited during a crisis, the public and media support the family support, the hospital's management support, and concern for the physical needs of the patient.

The results show that the factor with greatest importance on level of belongingness is public and media support ($M = 4.68$, $SD = 0.96$). The head nurse ($M = 4.66$, $SD = 0.96$) and recruited during crisis ($M = 4.63$, $SD = 0.62$). Factors having moderate importance were department (CD or NCD) WhatsApp group ($M = 4.20$, $SD = 0.87$) and concern for physical needs of patients ($M = 4.00$, $SD = 1.00$). The factor with least importance were family support ($M = 3.66$, $SD = 1.13$) and hospital management support ($M = 3.65$, $SD = 1.29$) (Table 4).

Multivariate model for belongings prediction

For assessing level of belongingness and socio-demographic variables, linear regression analysis was performed. The dependent variable was belongingness level. The predictors were working COVID-19 department, nurse seniority, time in non COVID-19 department, gender, marital status, WhatsApp group content - shift replacement, general updates, sharing personal experience, and professional problems solving-number of texting and reading messages daily, and stress levels during first three shifts in COVID-19 department.

The model shows positive correlation between nurse seniority and sense of belonging ($\beta = .28$, $p < .01$) Meaning, the greater nurses' seniority, greater sense of belonging. In addition, the more the respondents perceived content of WhatsApp group for sharing personal experiences the greater their sense of belonging ($\beta = .19$, $p = .03$). Moreover, the more the respondents estimated the content of the WhatsApp group for shifts replacements the lower their belonging was ($\beta = -.28$, $p < .01$) (Table 5).

Discussion

In this study investigating nurses' perceptions of the use of digital application communication, level of belongingness and stress before and during COVID-19 pandemic found that the nurses working in COVID-19 departments used the digital communication more for problem solving. The nurses working in COVID-19 departments had a higher level of belongingness and stress levels. The nursing teams in the COVID-19 departments had no prior familiarity with each other and the digital communication was probably used as a more acceptable pattern of forming team spirit, meeting in the break room or simply chatting during free minutes, were inaccessible. The nurses were not able to identify the team member face- they needed to use the photo profile on the WhatsApp in order to recognize the person. In order to form a kinship or a sense of team relationship, the digital communication WhatsApp was used significantly more frequently in COVID-19 nursing teams compared to non COVID-19. In addition, COVID-19 nurses' data demonstrated that the more nurses shared personal experiences the greater the feeling of belongingness. Those only using WhatsApp for shift changes, sharing less personal experiences had lower sense of belonging. As nurse leaders, we aspire to create a sense of belonging in our nursing teams in order to prevent burnout and create a stronger sense of loyalty [20].

Comparing the WhatsApp content between CD and NCD, the CD team used this platform to solve professional problems- For example- post natal mothers needed to have uterine monitoring every 2 hours in the COVID-19 department; nurses working in CD were equipped with their work experience only from internal medicine departments and had no background working with post-natal mothers. They used the WhatsApp to contact maternity nurses and received on line education.

Regarding the stress level - the anxiety of the unknown was higher before compared to after working in the COVID-19 department. The use of WhatsApp could have been a mediator reducing the stress level. The use of WhatsApp as a platform for knowledge transfer may have reduced the stress of uncertainty. A 2020 Italian study investigated the use of WhatsApp between medical teams and patients and their families. The study found that WhatsApp facilitated clinical communications, reduced stress, improved patient security, and psychological positive implications in patient's care during COVID-19 period [21].

More important, we found in this study that media had a strong influence on belonging- perhaps the nurses had a feeling of belonging to something bigger than just their COVID-19 department- but a wider audience. A 2021 discourse analysis exploring the portrayal of nurses as heroes in the media, found that nurse heroism redefines nursing work from the commonplace and ordinary to the exciting and impactful. This "hero" depiction created a public reward for nurses, who, according to the media, are a group whose contributions were unknown by the public before COVID-19 [22]. The current study found the sense of internal personal mission was higher in the CD team compared to NCD - reinforced by the media recognition, ignited the internal feeling of belonging.

Limitations

The time periods between first questionnaire distribution and COVID-19 elapsed 7 years. This time difference may have multiple effects; more people were familiar with the use of the digital communication WhatsApp during the COVID-19 period. Secondly, nurses relied on the digital platform to communicate with people outside of the COVID-19, because wearing protective gear inhibited the use of a regular telephone. Thirdly, before COVID-19 nurses could socialize with each other by meeting in the break room, or talking before and after shifts, during COVID-19 informal socialization in this manner was challenging if not totally impossible. An additional limitation is that during the COVID-19 period the level of stress generally was higher compared to pre-pandemic period. Lastly, during the COVID-19 period the nurse teams were unfamiliar with each other and simply looking at the profile picture in the WhatsApp enabled the nurses to identify their co-workers.

Conclusions

We believe that the use of a digital application like WhatsApp is an important platform to promote team cohesiveness and belonging even during short temporary situations. The App has many uses including immediate knowledge transfer and to connect inter-professional use for training. The knowledge and skills are immediate accessible. This platform is particularly essential when used among team members not previously known to each other. In order to sustain the level of

belongingness we should try to maintain the public's appreciation and value of nurses. We should strive to keep nurses in the limelight through media and governmental leaders in order to maintain spirit and internal motivation.

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