

ORIGINAL RESEARCH

Nurses' professional identity and information needs in the time of Covid-19: A latent cluster analysis

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ABSTRACT

The aims of this study are to find out, how nurses differ regarding their professional identity in times of Covid-19 and if nurses of different clusters of professional identity also differ regarding their satisfaction with their information needs. To get more insights in nurses work situation in Covid-19, we asked nurses about information sources they use to get information about Covid-19, by whom they feel supported, and if they feel fear working in times of Covid-19. We conducted a cross-sectional study. We used online questionnaires. 266 Nurses in Germany (N = 266) participated in our study. The study was conducted during Covid-19 pandemic. Our results show that most nurses use information about Covid-19 provided by their organisation. Most of them find social support through their colleagues. There are two clusters of nurses with significantly different professional identities; these two clusters show significant differences regarding their satisfaction with information needs. The results of the study are important for nursing organisations that should provide information for their nurses and by this can have influence on their coping strategies.

Key Words: Professional identity of nurses, Nurses' fear, Nurses' information gathering, Social support in nursing

1. INTRODUCTION

The Covid-19 pandemic seems to be completely changing our society and understanding of work.^[1] Especially in nursing it is acknowledged to be “making nursing history”.^[2] Although it is part of nurses' work to handle complex requirements and fast-changing demands,^[3] the Covid-19 pandemic seemed to made visible the ambivalent situation in nursing. Studies show that the impact of the Covid-19 pandemic can also result in a higher number of nurses who have the intention to leave their job.^[4] Furthermore, studies showed that nurses' felt anxiety^[5] and stress while working in their jobs during the pandemic.^[6]

On the one hand, society and the political sphere seemed to acknowledge nurses' “central role to play in the battle against

COVID-19”^[7] and on the other hand nurses had to cope for instance with a lack of protective equipment or workforce.^[8] These changes in nurses' workplaces have been documented in different studies.^[9,10] For instance, studies have shown that nurses have had to fulfil new and different roles and accomplish new tasks.^[11] This indicates the need for an analysis of nurses' roles and thus their professional identity.

Nurses' professional identity could be described as their actions, their knowledge and skills, as well as their values and beliefs.^[12] Schön's model^[13] of the “reflective practitioner” shows how reflection of actions can influence professional practice. Reflection is essential for the development of professional identity and by this determining how professionals solve complex problems and cope with challenges.^[14] Cop-

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ing can be defined as specific actions that are applied to manage problems and challenges^[15] and by this a part of professional identity. Coping theory of Lazarus^[16] gives insights in how coping strategies can help to handle stressful events. Satisfaction with information needs and social support, as problem-focused coping strategies, are important for evidence-based nursing.^[17]

Therefore, this study wants to find out, how nurses differ regarding their professional identity in Covid-19 within their profession and if nurses of different cluster are more or less satisfied with regard to their information needs. To get more insights in nurses work situation in times of Covid-19, we also asked nurses what information sources they use to get information about Covid-19, about their social support, and about their feelings of fear working in the pandemic situation.

Therefore, the research questions of this study are

- (1) How do nurses differ regarding their professional identity in times of Covid-19 within their profession?
- (2) Do nurses of different clusters of professional identity also differ regarding their satisfaction with information needs?
- (3) What work situation with regard to information sources, social support, and feeling of fear do nurses face in times of Covid-19?

The study is based on theoretical assumptions on professional identity, theories on Coping, and theories on reflection.

2. BACKGROUND

The theoretical background of this study is on theories on professional identity and coping theories.

2.1 Professional identity

Professional identity is a complex construct including different components such as professionals' understanding of "who they are, their logics of action, how they act, their vocabularies of motive, and what language is salient".^[18] When defining professional identity, a variety of theoretical approaches and research paradigms can be used. For instance, Holland et al.^[19] describes professional identity as a part of nurses' personal identity and therefore related to their perception of their self in interaction with others as part of a society, which can have effects on choices about their current or future career.^[20] An further example can be found in research based on more psychological theories such as theories of self-concept^[21] focus on professional identity as a synonym for the self, in the sense of "our personal understanding of our perceived attributes".^[20] Another research line focuses specifically on the domain of nursing and defines the "who I am", the "what I do", and the "where I do it" as three major components of professional identity in

nursing.^[22]

In this study we follow a research paradigm focusing on theories of professionalisation and thus on "the process by which an occupation meets the characteristics of a profession."^[23] This reflects the dynamic process of academisation in nursing. Professional identity is a complex construct including different components such as professionals' understanding of "who they are, their logics of action, how they act, their vocabularies of motive, and what language is salient".^[18] In her conceptual analysis Fitzgerald^[12] shows that nurses' professional identity could be described by their actions and behaviours, knowledge and skills, and values, beliefs, and ethics. Furthermore, she argues that professional identity must be defined in relation to the context. Thompson et al.^[24] defined nurses' professional identity "in terms of meaning attached to the tasks and activities at work."^[12] That means that action and behaviours as work practices can form the professional identity of nurses and underline their role in an organisation.^[25] Another crucial component of professional identity can be found in knowledge and skills of the members of a profession. Formal vocational education and training and certificates can be seen as indicators of this.^[26] Professions can also be characterised by having shared values, beliefs, and ethics. These can be described as their common understanding of their profession and commitment to it. Nursing studies have found nurses' shared values in the form of social values such as altruism and ethical standards. All these aspects have to be considered in relation to the context and to socialisation processes happening in a context. Therefore, professional identity includes the belonging to a community and the way that professionals within a specific group share their knowledge and skills, values, beliefs, and ethics, leading to specific actions and behaviour. Measurements of professional identity should be able to capture all these aspects^[27] in a specific context.

Based on this, in this study, we define professional identity as the self-estimation of nurses' regarding their actions and behaviour (e.g. nursing style), their knowledge and skills (e.g. knowledge about infection diseases) and their values and beliefs (e.g. being proud to be a nurse) in the specific context of Covid-19.

2.2 Coping and satisfaction with information needs

Coping can be defined as "a set of cognitive and affective actions which arise in response to a particular concern".^[15] Theories on coping^[16] can give insights into how emotional stress, and reaction to this such as fear, are related to activities to handle the situation. Coping strategies can help people to manage stressful events such as challenges caused by Covid-19 and reduce negative impacts and resulting emo-

tions.^[16,28] Different frameworks of coping strategies, such as Aldwin and Revenson^[29] as well as Billings and Moos,^[30] describe the important role of information and social support. Information is an important part of evidence-based nursing. A systematic review by Fernandez et al.^[17] pointed out that it is very important in a pandemic that nurses are informed about the best nursing practices and infection control as well as the proper equipment to ensure personal safety. Therefore, in this study we focus on nurses' satisfaction of their need for information "that is required to accomplish a specific task".^[31]

2.3 Professional identity and coping

Schön^[13] shows how professionals in practice use their knowledge in order to solve problems and argues that most of them "know more that they can put in words".^[14] Reflection-in-action (during a situation) and reflection-on-action (about a situation in the professional practice) plays a key role in order "to make sense of experiences and uncertainty".^[14] The knowledge professionals gained based on their experiences is also part of their professional identity. It allows practitioner to solve problems, to manage challenges and to "cope with the problematic and differing situations in practice".^[14] Therefore, it gives professionals the opportunity to select instruments and strategies that are appropriate and suitable to handle a situation.

2.4 Nurses' work situation: Information sources, fear and social support

Bohlken et al.^[32] showed in their systematic review different forms of psychological stress for nurses in Covid-19 pandemic, such as feeling of fear. Based on these results, we wanted to get more insights in nurses' work situation and asked them about their feelings of fear, their use of information sources to get informed about Covid-19, and their estimation of social support. With regard to information sources being used to get informed about Covid-19, we focused on online and electronic information sources (such social media) and analogue information sources for example provided as information letters by organisations.^[33] We focus on nurses' fear as a reaction to the emotional stress caused by Covid-19. Fear can be described as the "confrontation with uncertainty and existential threat" (p.15167).^[34] Based on research on nurses' fear^[35] we focus on the feeling of fear over being isolated or in quarantine, being a risk for the health of one's own family members, and of experiencing a severe illness. With regard to social support, we followed Bohlken et al.,^[32] who underlined that it is necessary to consider both professional and private aspects. We focus on nurses' social support from their supervisors, colleagues, and family members.

Little is known about nurses' professional identity in times of Covid-19. In their qualitative study Sheng et al.^[36] described their professional identity as "not static and easily affected by many factors." Their results show that among other things, nurses' fear and feeling of tiredness is affecting their professional identity. With regard to emotional stress and fear, studies focused on nurses different coping strategies such as physical exercises or virtual support.^[37] Little is known about nurses' problem-focused, work-related coping such as their satisfaction of information needs in times of Covid-19. With regard to coping strategies, a review by Bohlken et al.,^[32] about health-care workers' situation during the Covid-19 pandemic indicates further research about coping strategies as necessary.

Therefore, the goal of this study is to find out, if nurses differ regarding their professional identity and if nurses of different cluster of professional identity do have different satisfaction with information needs. Furthermore, we wanted to know what information sources nurses use and if they feel fear, and if they are getting social support.

3. THE STUDY

3.1 Aims

The aims of this study are to find out, how nurses differ regarding their professional identity in times of Covid-19 (Research Question 1), and if nurses of different clusters of professional identity also differ regarding their satisfaction with information needs (Research Question 2). To get more insights in nurses work situation in Covid-19, we asked them about the information sources they use to get information about Covid-19, if they get social support, and if they feel fear working in times of Covid-19 (Research Question 3).

3.2 Design

We conducted a cross-sectional study and used an online questionnaire.

3.3 Participants

A total of 266 nurses (N = 266) participated in our study. We contacted 391 hospitals and nursing homes in Germany and asked hospital manager to forward our Email to nurses.

3.4 Data collection

Data collection started in March 2021 and ended in July 2021 in Germany.

3.5 Measures

The following scales were included in our questionnaire: Based on the conceptual analysis of Fitzgerald^[12] we developed a scale measuring professional identity by action

and behaviours, knowledge and skills, values, beliefs, and ethics for the context of Covid-19. For example, to measure knowledge and skills (four items) participants were asked to respond to “I do have enough knowledge to handle the actual situation”. With regard to action and behaviour (3 items) participants responded to items such as “On my ward we do have enough resources to cope with the actual situation”. To measure values and beliefs, eleven items were developed and we asked participants for instance to respond to the statement “I am proud to be a nurse”.

We asked nurses about problem-focused coping strategy, specifically whether they are satisfied with their information gathering. With regard to satisfaction of information needs we developed items based on Clarke et al.^[31] and asked participants to estimate if they have all the information they think they need to fulfil their actual tasks. We asked participants to respond to three items such as “With regard to the Covid-19 pandemic, I think I do have all information needed for my job.”

In order to get more information how nurses were informed about Covid-19, we gave them a list of relevant sources (e.g. RKI [Robert Koch Institute, Germany’s central institute for health reporting and information], through the organization, colleagues, TV, internet, social media) and asked them to estimate which one they use to get informed in order to fulfil their work tasks.

Furthermore, we asked participants about their feelings of fear. We asked them to estimate if they are afraid of the main risks of the Covid-19 pandemic,^[32,35,38] having a severe illness, being isolated, and risking the health of family members. With regard to how they obtain social support, we gave them response possibilities such as talk to my leader, talk with colleagues, contact my professional network, and spend time with family. Furthermore, we asked them to indicate from whom they want support. For this question participants could choose between different options such as the organisation, the political sphere, or colleagues.

In our questionnaire we also included a question about nurses’ contact with Covid-19 patients as a control variable. With regard to background variables we asked nurses about their qualification, their age and sex, their occupational experience, and their organisation they work for.

3.6 Ethical considerations

In the questionnaire participants were informed about voluntary and anonymous data collection. Ethical approval was obtained from the ethics committee of the University of Schwäbisch Gmünd.

3.7 Data analysis

The analysis of our data included different steps:

(1) To answer our first research question (How do nurses differ regarding their professional identity in times of Covid-19?) we conducted a hierarchical cluster analysis using the ward approach (cf.^[41]). We validated our cluster solution through a latent class analysis (LCA) technique with MPlus using Schwarz’s Bayesian information criterion (BIC).

(2) Second, to answer Research Question 2 (Do nurses of different clusters of professional identity also differ regarding their satisfaction with information needs?), we used ANOVA to compare the clusters regarding professional identity and satisfaction with information needs. Furthermore, we describe characteristics of the clusters using descriptive statistics. We controlled for work experience, contact with Covid-19 patients, and the type of nursing organization (acute care, long-time care, nursing service).

(3) To get more insight in nurses’ work situation, we answered research question 3 (What work situation with regard to information sources, social support, and feeling of fear do nurses face in times of Covid-19?) using descriptive statistics and analysing percentage distribution.

3.8 Validity, reliability and rigour

To make sure that our scales meet the standards, we used explorative factor analysis, confirmatory factor analysis, and analysed Cronbach’s alpha. With regard to our scale measuring nurse’s professional identity, exploratory factor analysis shows a two-factor solution. This factor solution was confirmed with a confirmatory factor analysis in which both factors show an acceptable fit (CFI 1.0; SRMR .003, RMSEA .00; CFI 1.0; SRMR .002, RMSEA .00). One factor included seven items on knowledge and skills (4 items) and action and behaviour (3 items) with a Cronbach’s alpha $\alpha = .86$. The second factor included items on values, beliefs and ethics (11 items) with Cronbach’s alpha $\alpha = .80$. With regard to our scale on satisfaction with information needs, factor analyses showed the proposed one-factor solution with three items. The scale shows an acceptable fit in the confirmatory factor analysis (CFI 1.0; SRMR .00, RMSEA .00) and Cronbach’s alpha $\alpha = .70$.

4. RESULTS

4.1 Participants

266 German nurses (N = 266) participated in our study. 148 participants (55.6 percent) were registered nurses, 29 (10.9 percent) registered geriatric nurses, and 27 (5.8 percent) trainees in nursing. 53.4 percent of the participants had worked for more than eight years in their job. 53.8 percent of the participants have a full-time job and 35 percent a part-time job as nurse. Participants of our study are equally

distributed over age groups with 12.8 percent in the age of 18-25 years, 12.7 percent in the age of 25-30 years, 14.3 percent in the age of 30-35 years, 12 percent in the age of 35-40 years, 8.3 percent in the age of 40-45 years, and 27.2 percent older than 45 years (residual are missing values). 46.6 percent of the participants work in acute care in hospitals, 28.9 percent in organisations for long-time care such as residences, and 10.5 percent in nursing services.

4.2 Results of LCA and ANOVA

4.2.1 Hierarchical cluster analysis and latent cluster analysis

To answer Research Question 1 on the difference in nurses' professional identity, we used a hierarchical cluster analysis with SPSS. Hierarchical cluster analysis is a statistical technique that "combines cases into homogeneous clusters by merging them together one at a time in a series of sequential steps"^[39] The results show two different clusters nurses could

be assigned to regarding their professional identity. We validated the result with a latent class analysis in MPlus based on Schwarz's Bayesian information criterion (BIC). These results also suggested the two-cluster solution (AIC 444.995 BIC 446.265 aBIC 446.265). Responses of 181 nurses (N = 181) could be assigned to cluster 1. Cluster 2 includes answers of 63 nurses (N = 63). To find out if differences regarding professional identity are significant we conducted an ANOVA test.

4.2.2 ANOVA

The results of ANOVA show significant differences regarding professional identity. There are also significant differences regarding satisfaction with information needs. Table 1 shows the results of the ANOVA with the F-test for comparing the means of the cluster,^[40] *p*-value, the mean values and standard deviation for each cluster and the eta square as the effect size of the ANOVA.

Table 1. Results of ANOVA

	F (2/111)	<i>p</i>	<i>h</i> ²	Cluster 1 (M/SD)	Cluster2 (M/SD)
Professional Identity (5-point Likert scale 1 = absolutely agree – 5 = no agreement)	3040.19	.00	.96	M = 1.83 SD = .23	M = 2.57 SD = .19
Satisfaction Information Need (5-point Likert scale 1 = absolutely agree – 5 = no agreement)	16.59	.00	.07	M = 2.73 SD = .63	M = 3.17 SD = .61

Regarding their professional identity, nurses in cluster 1 (M = 1.83 SD = .23) estimate their knowledge and skills as sufficient to handle the complex situation of Covid-19 and consider themselves able to choose the right actions. They like their jobs and are convinced of performing an important service. Nurses in cluster 2 (M = 2.57 SD = .19) show a more problematic estimation of their professional identity. Nurses in this cluster rate their knowledge and skills as well as their behaviour as mean sufficient to cope with the situation. Additionally, regarding their values, beliefs and ethics, they choose a middle response option and in total show less agreement. Nurses of cluster 1 feel sufficient informed about Covid-19 (M = 2.73 SD = .63) and nurses of cluster 2 feel significantly less informed (M = 3.17 SD = .61).

4.3 Description of the clusters and their work situation (information sources, fear, and social support)

4.3.1 Cluster 1: Yes, we can!

About 18.5 percent of nurses in cluster 1 had no contact with Covid-19 patients in their daily work. 77.4 percent do have contact regularly. 19.9 percent of these nurses indicated that

they sometimes face a lack of protective equipment. 55 percent of the participants of this cluster are registered nurses. 54.4 percent have worked in their job as a nurse for more than eight years. 12.3 percent are in the age of 35-40 years. The largest percentage of them, 50 percent work in hospitals, 28.1 percent in organizations for long-time care and 9.6 percent in nursing services.

With regard to information sources, 79.8 percent of the participants got their information about Covid-19 from their organization, 39.3 percent from their colleagues, 38.9 percent from TV, 22.6 percent from social media, and 60.7 percent from the RKI. With regard to fear, 10.7 percent of participating nurses indicate that they do feel fear of being isolated, 22.6 percent fear being a risk to the health of their family members, and 16.7 percent fear having a severe illness. With regard to these questions, participants could give several answers. With regard to social support in this situation, 28.6 percent of the nurses talked to their supervisor, 76.2 percent with colleagues, 32.1 percent with contacts in their professional network, and 66.4 percent with their family members.

4.3.2 Cluster 2: Yes, we can a little bit!

About 89 percent of nurses of cluster 2 do have contact with Covid-19 patients; 6.9 percent do not. 34.4 percent face a lack of protective equipment. 75 percent of the nurses are registered nurses with 42.2 percent of them worked in their job as a nurse for more than eight years. 10.9 percent are in the age of 35-40 years. 65.9 percent work in hospitals, 20.3 percent in organizations for long-term care, and 9.4 percent in nursing service.

With regard to information sources, 81.8 percent of the participants got their information about Covid-19 from their organization, 55.1 percent from their colleagues, 36.2 percent from TV, 20.0 percent from social media, and 49.2 percent from the RKI. With regard to fear, 19.5 percent of participating nurses indicate that they do feel fear of being isolated, 44.3 percent fear being a risk to the health of their family members, and 24.9 percent fear having a severe illness. With regard to these questions, participants could give several answers. With regard to social support in this situation, 23.2 percent of the nurses talked to their supervisor, 76.2 percent with colleagues, 31.9 percent with contacts in their professional network, and 72.4 percent with their family members. Table 2 shows the results of cluster 1 and cluster 2.

Table 2. Information source, fear, and social support of cluster 1 and cluster 2 in percent

		Cluster 1	Cluster 2
Information source	Organization	79.8	81.8
	Colleagues	39.3	55.1
	TV	38.5	36.2
	Social media	22.6	20.0
	RKI	60.7	49.2
Fear	Isolation	10.7	19.5
	Risk for family members	22.6	44.3
	Severe illness	16.7	24.9
Social support	supervisor	28.6	23.2
	Colleagues	76.2	76.2
	Professional network	32.1	31.9
	Family	66.4	72.4

5. DISCUSSION

With regard to nurses’ work situation, our results show that most of the participants get information through their organization. Nurses do have fear; most of them having fear risking family members’ health. Most of them find social support through their colleagues.

With regard to our research question on differences on nurses’ professional identity in times of Covid-19, our results indicate that nurses’ responses can be assigned to two clusters.

Nurses’ professional identity differs significantly. One cluster shows nurses estimating their knowledge and skills and their actions as appropriate for the situation and indicates that they like their job as nurses. The second cluster includes nurses that rate their professional identity less positively with regard to knowledge and skills, behaviour and actions, and values, beliefs and ethics. Nurses of both clusters feel confident regarding their professional identity. Nurses of different clusters show significant differences regarding their satisfaction with information. Nurses of cluster 1 are more satisfied with information needs than nurses in cluster 2.

The results of our study contribute to the existing literature in several ways: first, professional identity is a dynamic construct that is formed and changed by “professional and personal aspects of life”.^[41] Therefore, our results give an important insight into nurses’ professional identity in an unprecedented situation. Second, these results show that nurses with different characteristics regarding their professional identity also have different estimations of how informed they are. These results are important for our understanding of the impact of coping strategies^[37] such as becoming informed. Nursing is a dynamic field of work and therefore nurses always will have to face challenges. The results of our study underline the impact of professional identity on coping with an unimaginable challenge such as Covid-19.

5.1 Limitations

One limitation of our study is the small sample size. To get comparable data it was necessary to stop data collection when circumstances regarding Covid-19 changed. With this study, no information about the change of professional identity could be given. It was necessary to develop a scale for measuring professional identity in Covid-19 times, and therefore our results can only give insights about professional identity under these specific circumstances.

5.2 Future research

Future research should focus on nurses professional identity as a dynamic construct and use longitudinal study design to get insights how nurses’ professional identity changes over time and with regard to different situations. Furthermore, research should get insights the role of social media as information source and its relation to the professional identity of nurses.

6. CONCLUSION

While other studies focused on factors affecting professional identity such as stress,^[36,42] the goal of this study is to find out if nurses differ regarding their professional identity in times of Covid-19. The results of our study highlight the

impact of nurses' professional identity. Having knowledge and skills, being able to choose the right actions, and having positive beliefs in one's own impact is essential for providing high-standard care. Our results show that getting the information needed for caring in such a complex situation as

Covid-19 is an important aspect.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare that they have no known competing financial interests or personal relationships that could appear to have influenced the work reported in this paper.

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