IMPACT OF LEADERSHIP STYLE AND CRISIS SKILLS OF NURSING MANAGERS ON THE SAFE WORKING CLIMATE OF NURSES DURING THE COVID-19 PANDEMIC IN SELECTED HEALTH CARE FACILITIES IN THE SLOVAK REPUBLIC
VPLYV ŠTÝLU VEDENIA A KRÍZOVÝCH ZRUČNOSTÍ MANAŽÉROK OŠETROVATEĽSTVA NA BEZPEČNÚ PRACOVNÚ KLÍMU SESTIER POČAS PANDÉMIE COVID-19 VO VYBRANÝCH ZDRAVOTNÍCKYCH ZARIADENIACH V SR

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ABSTRACT

Background: Research of managerial skills is limited during the COVID-19 pandemic. The managers of nurses should be able to create in nurses a feeling of safety, satisfaction, pride for work or perception of work as a mission. Defining the skills important for this aim and mechanism of its effective operation is a very important topic of interest.
Aim: Examine the interrelationship of the crisis skills of nursing management and nursing staff´s safety climate and at the same time whether this connection is supported by the transformational or transactional style of management leadership.
Sample and methods: During September 2020, we conducted research using questionnaires designed using standardized measurement instruments. The sample consisted of 606 nurses in Slovakia from 3 faculty and university hospitals and 8 general hospitals (private providers).
Results: The hypothesis of dependence between crisis skills of nursing management and safety climate in a hospital, mediated by a transformational/transactional style of management, was confirmed by research. Complete mediation was identified, where up to 86% of the total effect is realised by mediating variables with a significant influence of the transformational leadership style.
Conclusions: The need for quality nursing management, which has the professional knowledge and the managerial skills needed to manage medical teams in a challenging and emotional situations.

Key words: Nurses. Covid-19 pandemic. Crisis skills. Safety Climate. Leadership.

ABSTRAKT

Východiská: Výskum v oblasti manažérskych zručností je v čase pandémie Covid-19 minimálny. Manažérky v ošetrovateľstve by mali byť schopné vytvoriť u sestier pocit bezpečnosti, spokojnosti, hrdosti na prácu či vnímania práce ako poslania. Vymedzenie zručností, významných pre tento účel a mechanizmu ich efektívneho pôsobenia je veľmi dôležitou témou záujmu.
Ciele: Preveriť vzájomný vzťah krízových zručností ošetrovateľského manažmentu a bezpečnej pracovnej klímy u sestier a zároveň, či je táto súvislosť podporená transformačným alebo transakčným štýlom vedenia manažérov.

Súbor a metodika: Počas septembra 2020 sme realizovali výskum pomocou dotazníkov, vytvorených použitím štandardizovaných nástrojov merania. Vzorku tvorilo 606 sestier na Slovensku z 3 fakultných a univerzitných nemocníc a 8 všeobecných nemocníc (súkromní poskytovatelia).
Výsledky: Hypotéza o závislosti medzi krízovými zručnosťami ošetrovateľského manažmentu a vnímanou klímou z pohľadu bezpečného prostredia v nemocnici, ktorá je sprostredkovaná transformačným/transakčným štýlom vedenia bola výskumom potvrdená. Identifikovaná bola úplná mediácia, kedy až 86% celkového efektu je realizovaného sprostredkujúcimi premennými s významným vplyvom transformačného štýlu vedenia.
Záver: Potreba kvalitného manažmentu v ošetrovateľstve, ktorý disponuje nielen odbornými znalosťami, ale aj manažérskymi zručnosťami, potrebnými pre riadenie zdravotníckych tímov v náročnej a emóciami vypätej situácii.

Kľúčové slová: Sestry. Pandémia Covid-19. Krízové zručnosti. Bezpečná klíma. Vodcovstvo.

INTRODUCTION

The profession of a nurse in connection with COVID-19 global pandemic gets significantly into the attention of the whole society. Nurses play an important role in the infection prevention, infection control, isolation, containment, and public health however they work under strong stress, decide under the influence of emotions, mostly fear, anger, frustration, worries. Even though certain individual resistance and attitudes of nurses are important, in larger measures nurses need their employers, their teams, their leaders to support them by actions and resources. For this reason, the topic of crises skills of nurses' managers is both very important and unexplored. Their ability to create the sense of safety, satisfaction, pride for work or perception of work as a mission is a very valuable skill of nurses' manager in the COVID-19 period. What is safety climate

from the nurse point of view? Does a direct effect exist between these two variables or is their relation much more complicated? What is the mechanism of their interaction? These research questions are the bases of the construction of our research model.

Current studies and literature on nursing management in crises, specifically during the COVID-19 pandemic, address the possibilities of supporting nurse's psychological and mental health (Greenberg et al., 2020; Lai et al., 2020; Maben, Bridges, 2020; Nie et al., 2020). On the other hand, there are opinions that nurses do not need psychological interventions at this time, they even resist them (Chen et al., 2020), but in terms of Maslow's hierarchy of needs, they require the satisfaction of basic human needs and feeling of safety at work (Ehrlich et al., 2020).

This study's central concept is based on the theory of crisis management, according to which employee orientation and the creation of suitable working conditions for quality performance in times of crisis are paramount (Kash et al., 2018). Therefore, we consider "Safety Climate" (SC) to be an independent variable of our model, defined by the use of the Safety Attitudes Questionnaire (SAQ), which is a refinement of the Intensive Care Unit Management Attitudes Questionnaire (Sexton et al., 2006). In the context of effective crisis management, essential factors are the management of effective and efficient communication (mostly internal), the use of appropriate leadership style, the ability to make adequate decisions (Bhaduri, 2019; Pearce et al., 2020; Shore, 2020; Vainieri et al., 2019).

Based on the literature search, we extracted the most common elements in communication skills and decision-making, from which we compiled a baseline variable called Crisis Nursing Management Skills (CSNM). We assume that "CSNMs are positively associated with nursing staff´s SC" – hypothesis H1. Another hypotheses (H2, H3 and H4) concern mediation effect of transformational (TFL), respectively the transactional leadership style (TSL). We explicated these hypotheses based on existing studies about its important impact on the variable of nurses' climate in hospitals examined by us. (Xie et al., 2020; Brown et al., 2013; Wang et al., 2018; Boamah et al., 2018; Asif et al., 2019; Catton, 2020).

AIM

The aim of the study was to examine the relationship between CSNM and nursing staff´s SC in health facilities and whether TFL or TSL supports this relationship. Furthermore, our effort is to examine the relationships mentioned earlier and the mechanism through which the above variables interact. The main research hypothesis is: There is a positive relationship between CSNM and nursing staff´s SC, mediated by TFL / TSL. The model in Figure 1 shows the investigated relationships.
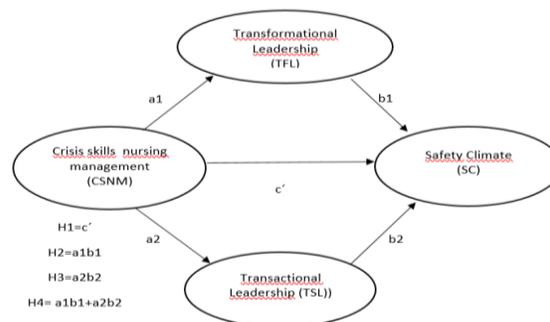

Figure 1 Research model

SAMPLE

The sample consists of nurses working in hospitals in the Slovak Republic. The study included three faculty and university hospitals, managed by The Ministry of Health and eight general hospitals in the form of major private healthcare providers in Slovakia. In total, there are eleven facilities from all eight regions of Slovakia. The representativeness of the sample was created by establishing the same criteria for selecting nurses in each hospital. First criterion – the nurses did not hold a managerial position. Second criterion – the nurses were not recent graduates, and their minimum length of practice was at least one year due to their ability to answer relevant questions in a relevant way. Third criterion - the nurses were classified as general or specialised nurses. The fourth criterion was the willingness to cooperate based on anonymity. A total of 2695 questionnaires were distributed, with a return rate of 22.5 %. It follows from the above that the sample consisted of 606 nurses, of which 591 were women and 15 men, 348 (57.4 %) nurses were specialised, and 258 (42.6 %) were general nurses. The respondents' mean age was 43 years with a standard deviation of 11.5 (min. = 22, max. = 65 years). The average length of practice was 18.8 years with a standard deviation of 10.6 (min. = 2, max. = 41 years).

METHODS

Data collection took place by contacting the

middle nursing management in individual hospitals according to departments (in person or by telephone). The purpose of the study, the content of the questionnaires with emphasis on the participating nurses' anonymity and the possibility to obtain the results of the study after its processing were explained to the leading nurses. Some head nurses refused to cooperate due to lack of time and critical situation. In case of willingness to cooperate in the survey, a questionnaire was handed over to head nurses in paper form, which was then distributed to subordinate staff in the department. Voluntary consent to participate in the study was fulfilled as a fundamental ethical principle, and at the same time, an essential part of obtaining consent to participate in the study was to keep participants fully informed about the study's objectives, course, and risks. After completing the questionnaires, they were either sent by post to the researchers' address or were picked up in person by the researchers from head nurse. This process took place in January 2021. In addition to the respondent's identification data (age, gender, general or specialised nurse) and the facility (Faculty/University or general hospital), the questionnaire contained items of selected variables, scaled by the Likert scale.

CSNMs is operationalised as a score obtained by crisis management based on the evaluation of 2 items – crisis communication (8 items) and decision-making in crisis (8 items) by nurses. In total, the independent variable CSNM contains 16 items, which are scaled using 5-point Likert-type scales (1= strongly disagree and 5 = strongly agree). After reliability analysis, the Cronbach's Alpha of the CSNM was 0.935 (16 items).

Nursing staff´s SC is operationalised as nurses' score to items representing job satisfaction, a sense of security and quality, and safe working conditions. We used SAQ, which has been validated by many researchers for the healthcare delivery environment. In total, the variable contains 24 items, which are scaled using 5-point Likert-type scales (1= strongly disagree and 5 = strongly agree). After reliability analysis, the Cronbach's Alpha of the SC was 0.949 (24 items).

TFL and TSL were identified as mediation variables. They are operationalised as expressions of nurses in relation to the four dimensions of transformational leadership – intellectual stimulation, inspirational motivation, idealised impact, individual approach, which were measured using a 20-item scale

and two dimensions of transactional leadership - conditional reward and exception management, measured using a 7-item scale. Multifactor Leadership Questionnaire is considered the best-validated measure of TFL a TSL (Kirkbride, 2006). Responses to individual items within the TFL and TSL characteristics were scaled on a 5-point scale (1 = very seldom to 5 = very frequently). After reliability analysis, the Cronbach's Alpha of the TFL was 0.925 (20 items) and TSL 0.915 (7 items).

All data were analysed using the SPSS 22.0 software package. Cronbach's Alpha coefficient was used to assess the internal consistency of the scale's reliability. Based on Hofmann's suggestion, we conducted a hierarchical regression analysis to test the mediating effect (Hofmann, 2002). The Sobel test was used to test the mediator effect. A series of regression analyses were used to identify the proposed hypotheses. The ANOVA variance analysis was used to analyse multiple dependencies. We have worked with a 5% significance level.

RESULTS

Relationships between individual variables were determined using a correlation matrix, including control variables. It is clear from the correlation matrix that there are significantly significant po-sitive correlations between all the variables examined, indicating the use of a mediation model. We added nurse's age, gender, tenure and specialisation (control variables) to model the overall effect. As an intermediate step, the analysis of variance ANOVA was used to analyse multiple dependence, where we discovered that only the age variable is significant from the mentioned control variables. The dependence is negative; therefore, older age is related to lower SC values.

Subsequently, we proceeded in three steps, in which we verified partial hypotheses by calculating three regressions – Table 1. Using the Sobel test (A*B = 0.861, z = 24.6, SE = 0.035, p-value. = 0.000), we found that the overall indirect effect is significant in the positive direction. We present the effects in a standardised form. Standard errors are calculated from the bootstrap method with 5000 repetitions.

The obtained results show that the nursing staff's SC in Slovak hospitals is influenced by the independent variable CSNM in the form of a direct effect, acting positively. However, its effect is significantly amplified by mediating variables TFL and TSL, as the overall indirect effect is significant in the positive

Table 1 Multiple regression

Variable	Model 0			Model 1			Model 2			Model 3			Model 4		
Dependent	SC			SC			TFL			TSL			SC		
	C	SE	S	C	SE	S	C	SE	S	C	SE	S	C	SE	S
Constant	-0,008	0,700	-	-0,072	0,029	-	0,067	0,027	-	1,977	0,081	-	-0,254	0,024	-
Main effects															
CSTM	1,181 **	0,140	1,019 **	1,186 **	0,120	1,024 **	1,156 **	0,110	1,025 **	0,642 **	0,034	0,793 **	0,189 **	0,030	0,163 **
TFL	-	-	-	-	-	-	-	-	-	-	-	-	0,827 **	0,026	0,806 **
TSL	-	-	-	-	-	-	-	-	-	-	-	-	0,064 **	0,009	0,045 **
Controls															
age	-0,006 **	0,002	-0,087 **	-0,004 **	0,001	-0,061 **	-0,004 **	0,001	-0,059 **	-0,009 **	0,002	-0,190 **	0,000	0,001	-0,005
gender	-0,100	0,040	-0,002	-	-	-	-	-	-	-	-	-	-	-	-
specialization.	0,140	0,190	0,009	-	-	-	-	-	-	-	-	-	-	-	-
tenure	0,002	0,002	0,025	-	-	-	-	-	-	-	-	-	-	-	-
R2	0,966	-	-	0,966	-	-	0,970	-	-	0,457	-	-	0,989	-	-

Legend: CSNM = crisis skills nursing management, SC= nursing staffˇs safety climate, TFL = transformational leadership, TSL = transactional leadership, gender (male=0, female=1), specialization nurses (no = 0, yes = 1), R2.adj – adjusted coefficient of determination, C = coefficient, SE – standard error of the estimate, S = Standardized, **p > 0.05.

direction. Since the two leadership styles we examined are perceived as contradictory in management theory, we expressed an indirect effect through the contrast of these two mediators TFL and TSL, which is in the form of their difference and was tested for significance and direction. The results are as follows: contrast = 0.790, standard error of the estimate = 0.044 and z_i = 17.955 at p-value < 0.001.

When expressing the size of individual effects as a percentage, based on the obtained coefficients, we state that the direct effect's size is 16% (coeff. = 0.163) and the size of the indirect effect is 84% (coeff. = 0.861). The relationship between CSNM and nursing staff's SC in hospitals is mediated mainly through the mediating variables TFL and TSL, emphasising the TFL variable. This finding supports the thesis of the importance of a transformational leadership style in the context of the COVID-19 pandemic for ensuring a safety climate perceived by nurses in hospitals.

DISCUSSION

The hypothesis of dependence between the crisis skills of nursing management and nursing staff's safety climate in a hospital, mediated by a transformational/transactional style of management, has been confirmed by research. Complete mediation was identified, where up to 86% of the total effect is realised by mediating variables with a significant influence of the transformation style of leadership.

This is an important finding, namely that in times of crisis, nursing staff's safety climate in the hospital, expressed through the satisfaction of nurses at work, their sense of safety and quality and safe working conditions, is influenced by crisis skills of nursing management and the positive effect of skills. They are primarily transmitted through the transformational style of health management leadership towards nurses in their work performance. Nursing management has researched crisis skills as self-acting factors are not crucial in examining the relationship when ensuring climate safety. Therefore, we consider our findings to be original and deepening state of knowledge in the area of the impact of managerial skills on employees' performance in times of crisis. In previous studies, only simple cross-correlations have been found between sub-items of crisis skills and different views on the performance of nurses, e.g. nursing management communication skills versus nurses' mental comfort (Morganstein et al., 2020), nursing communication skills versus nurses' job satisfaction (Bhaduri, 2019), leadership transformation style versus downsizing anxiety in first-line nurses (Labrague et. al., 2020), or versus willingness to stay in crisis (Adams et al., 2020).

It should be noted that the approach to nurses in times of acute crisis is changing. Therefore a comprehensive and in-depth look at the possibilities of creating such an organisational culture in a health care facility that will help address this unprece-

dented situation is needed (Chen et al., 2020). Our findings show that transformational leadership amplifies the positive effects of using the nursing managers' crisis skills to create a comprehensive safety climate in healthcare facilities. Skills alone do not have this effect to such an extent. This means that effective communication or quick and responsible decision-making is not enough. Leadership style is the tool that creates a background for positive associations with the satisfaction of nurses at work, the feeling of quality and safe working conditions. Among the attributes of the transformational leadership style, items of idealised influence and inspiring motivation were highlighted. Therefore, our study brings new findings, namely those in times of crisis, those aspects of the transformational style of management that lead to the stability and anchoring of employees in tense situations are the priority. Our findings partially agree with some authors' claim that the crisis requires situational leadership (Forster et al., 2020) and that the approach to nurses during an acute crisis is changing (Chen et al., 2020). Therefore, we point out that it is impossible to separate transaction and transformation managers too strictly because a successful leader uses transactional and transformational management resources. The relationship between nursing staff's safety climate in the hospital and transactional leadership style was significant in the positive direction. However, when monitoring the contrast under the indirect effect, a much lower indirect effect of transactional style was discovered compared to the transformational leadership style. Transactional leadership is essentially conditional consolidation, a principle that describes theories of modification of organisational behaviour, which during pandemic conditions due to nurses' high efforts, orientation to the mission of their work rather than a reward, is not so important leadership style. However, it is not entirely negligible, and the conditional remuneration of its items has proved to be significant.

Limitations

The presented study has several limitations. The first of them is the geographical limitation of the study to the territory of the Slovak Republic. The second limitation is a relatively small sample of respondents (606) given the total number of nurses in Slovakia. On the other hand, we covered all Slovakia regions, which could support the generalisation of results for the Slovak healthcare system. We are also aware of the possible limitation resulting from the fact that we deal only with the relationships between variables in the modelled relationships. To claim causality, we lacked two conditions: time distinction and exclusion of another option (we had this condition partially fulfilled by controlled effects, but not entirely, as our data were not experimental, but questionnaires and formed a so-called "convenience sample"). Therefore, we did not address these issues. In the future, our research can be transferred to the level of causality research using dynamic panel regression, which will allow us to take into account the existence of endogeneity and more appropriately describe the ongoing process of adaptation over time as in the case of a static panel. The fourth limitation is nurses' subjective view as hospital employees on their management, which could differ if the management itself is interviewed.

Consequently, future research can focus on management's view of their crisis skills. Finally, in addition to the factors concerned in this study, other factors may affect the examined relationships. In the future, other theories can be combined, and comprehensive analysis can be performed from various perspectives.

CONCLUSION

COVID-19 global pandemic revealed many individuals as well as systemic problems in crisis nursing management. The main conclusions and implications for practice based on our study results are the need for quality nursing management, which has the professional knowledge and the managerial skills needed to manage medical teams in a challenging and emotional situations. Lessons from previous crises did not seem to be sufficient. Therefore, we appeal to quality nursing research in the period of COVID-19 global pandemic and its apparent implications, which, together with previous findings, may show a correct approach in similar situations in the future. A key aspect is a management. Our findings confirm that nursing management's crisis skills are positively related to the quality performance of nurses, for which nurses need safe working conditions, receptive management, mental well-being, stress relief, teamwork climate, and job satisfaction. This effect is significantly amplified using the transformational leadership style, especially the idealised influence and inspiring motivation as part of it. The interdisciplinary approach is irreplaceable in current research, as evidenced by our findings. The penetra-

tion of management as science into nursing is essential. At the same time, researchers' international co-operation in this field is necessary to further develop the knowledge based on the international scientific community.

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