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ORIGINAL PAPER

Teamwork among nursing staff: a cross-sectional study

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Abstract

Aim: To determine the level of teamwork among nursing staff in a selected teaching hospital and identify factors that influence the level of teamwork. *Design:* A descriptive cross-sectional study. *Methods:* The sample included 292 nursing staff working in a teaching hospital in the Žilina region of Slovakia. Data collection was carried out between April and June 2022 using the Nursing Teamwork Survey (NTS). Data were analyzed using descriptive and inferential statistics. *Results:* The mean score for the NTS was 2.87 (SD = 0.56) demonstrating a positive perception of teamwork less than 75% of the time. The highest evaluated subscale was the shared mental model (3.23 ± 0.62). Differences were found in the evaluation of teamwork according to education, job position, working hours, total and current professional experience, intention to leave, and staffing adequacy. The correlation analysis revealed associations between teamwork and variables related to satisfaction and quality and safety evaluation. Several variables predicted the general evaluation of teamwork ($p < 0.05$). *Conclusion:* The evaluation of teamwork may point to its different perception among members of nursing teams. It may also help to identify strengths and weaknesses of nursing teams and, consequently, to implement effective techniques focused on improving teamwork and, thus, the quality of nursing care in hospitals.

Keywords: hospital, nursing team, Nursing Teamwork Survey, teamwork.

Introduction

When providing health care with an emphasis on its quality and patient safety, effective teamwork is a necessity (Babiker et al., 2014). It minimizes the occurrence of adverse events and helps to prevent errors caused by miscommunication between team members or the misunderstanding of assigned or delegated tasks, which can result in harm to the patient or healthcare professional (Alkhaqani, 2022; Babiker et al., 2014; Salas et al., 2007). For effective team cooperation, it is necessary to adopt a team culture in which common values are shared and there is also transparent communication between team members, both with each other and with the patient.

The principles of teamwork were investigated by Salas et al. (2005), whose model describes team orientation, team leadership, monitoring of mutual results, support, and adaptability as five basic elements of teamwork. For the effective functioning of the team, members must have clear roles and responsibilities assigned to them within the team. In a later work (Salas et al., 2007), the authors also included the concept of shared mental models of the team in team orientation. This represents an overlap of different experiences and skills of individuals that function as the basis for decision-making and understanding between them. A shared understanding of tasks contributes to the maintenance of commitment and work performance, especially when the team is faced with critical situations.

Another prerequisite for an effectively functioning team is the team leader, who must not only be technically skilled, but must also be competent in leadership skills. The team leader must work effectively across disciplines that go beyond his / her own field (van Diggele et al., 2020). Leadership is associated with the decision-making process, creating an adequate and comfortable environment for work, adequate distribution of workload and tasks among staff, conflict solving, and the advancement of the team, its members, their cooperation, and professional skills (Kourkouta et al., 2021).

To monitor mutual results, the team should have a clear shared vision. A common goal contributes to a common understanding of what the team wants

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to achieve. Clear goals are not only the first step in achieving them, but also provide an opportunity to evaluate the team's performance. Feedback presents a chance for team improvement in terms of self-evaluation, adaptation, and learning from their experiences. Salas et al. (2005, 2007) draws attention to the extension of the monitoring of mutual results by using the methods of briefing and debriefing. The cycle mentioned facilitates team learning and development, self-reflection on efficiency, processes, results, morale, and team safety. The Agency for Healthcare Research and Quality (AHRQ, 2012) also calls for this cycle to be a feature of interventions to improve team collaboration in care units. Support, trust, and sense of security are essential in the formation of responsible and efficient teams (Kalisch et al., 2010). Such teams have a high team orientation and shared responsibility. Adaptability is a critical component in ensuring patient safety. Nursing teams should provide care based on scientific evidence, and their practices should reflect the latest recommended practices. Evidence-based nursing combines patient preferences, expertise, clinical experience of nurses, and proven best possible practice (Jarošová & Zeleníková, 2014).

To improve the quality of care, it is necessary to regularly assess and evaluate the level of teamwork. Within nursing, teamwork and its effectiveness were examined by Marlow et al. (2018). Teamwork is one of the fundamental components of providing quality nursing care that ensures patient comfort and safety (Freytag et al., 2017). As with other aspects of nursing care, it is important that teamwork be continually strengthened and improved (Buljac-Samardzic et al., 2020), which also bolsters the professionalism of individual team members. Regular evaluation of teamwork can form the basis of a better understanding of the functioning of teams, principles, and relationships that leads to the exposure of areas that could be improved within the team to achieve optimal performance (Babiker et al., 2014).

Teamwork can be assessed using self-assessment instruments. More than 40 evaluation instruments are available in the literature to measure teamwork in healthcare. However, the number of instruments for evaluating teamwork in nursing is extremely limited (Rosen et al., 2018). Teamwork occurs frequently in assessment tools (as a subscale) as part of the investigation of other concepts such as patient safety culture (Costello et al., 2021). Items aimed at teamwork can be found, for example, in the tools: the Hospital Survey on Patient Safety Culture 2.0 (AHRQ, 2013), the Stanford / PSCI Culture Survey (Singer et al., 2003), or the Safety Attitude Questionnaire (Sexton et al., 2006).

In nursing, there is only one instrument that focuses directly on the assessment of teamwork in nursing: the Nursing Teamwork Survey – NTS (Kalisch & Lee, 2010). It was designed for the evaluation of teamwork in acute care hospitals by nursing teams consisting of registered nurses, a nurse specialist, nurses in a managerial position (senior staff nurses, nurse managers), nurse aids, and nursing assistants (Kalisch et al., 2010). The goal of the NTS is the investigation of teamwork and behavior in a clinical setting. The tool consists of 33 items grouped into five subscales that are derived from the theory of Salas et al. (2005). The NTS has been used in several international studies (e.g., Bragadóttir et al., 2016; Costello et al., 2021; Kalisch et al., 2010). Research on the issue of teamwork in the Slovak Republic is very limited and is more oriented toward teamwork as part of the culture of patient safety (see, e.g., Gurková et al., 2020). Research focusing on teamwork as a central component in the context of the Slovak Republic is completely lacking.

Aim

To determine the level of teamwork among nursing staff in a selected teaching hospital and identify factors that influence the level of teamwork.

Methods

Design

In this study a descriptive cross-sectional design was adopted. The study was carried out according to the STROBE checklist.

Sample

The research was carried out in a selected teaching hospital in the Žilina region of Slovakia. Respondents (nursing aids, nursing assistants, registered nurses, and nurse managers) were selected using the convenience sampling method. In Slovakia, nurse aids are responsible for ensuring basic nursing care activities (such as patient turning, feeding, and ambulation) and are supervised by nursing assistants and registered nurses. Nursing assistants cooperate closely with registered nurses and are responsible for a diverse spectrum of nursing care activities, including the administration of injections, venipunctures, and other specific activities. Registered nurses are responsible for ensuring basic and specific nursing care activities, including the keeping of records. Nurse managers are

responsible for planning, organizing, and meeting strategic and operational goals in the nursing department. The targeted sample of respondents was selected according to the composition of the nursing team as stated in the Nursing Teamwork Survey (NTS; Kalisch et al., 2010). The nursing team plays a crucial role in healthcare settings, providing essential care and support to patients while working closely with other healthcare professionals. Their responsibilities are diverse and multifaceted, encompassing a wide range of tasks and duties aimed at ensuring the well-being and recovery of patients.

Twenty care units and / or clinics were approached, 19 of which agreed to cooperate with the study. In total, 425 questionnaires were distributed and 313 were returned, a response rate of 73.65%. We excluded 21 questionnaires due to their incompletion. Thus, 292 questionnaires were included in the final analysis.

Data collection

Data were collected between April and June 2022 using the specific NTS instrument to measure the level of teamwork among nursing staff. The instrument was linguistically validated in Slovak in accordance with the validation process of Wild et al. (2005). Apart from the process itself (translation into the target language and back-translation by two independent translators; comparison of translated versions and their unification; creation of the final version of the tool based on the consensus of the research team), face validity assessment was performed by a group of six nurse educators and researchers in nursing from a nursing faculty in the Slovak Republic. According to the assessment, the NTS instrument was considered a comprehensive instrument, and the items were evaluated as relevant for measuring the level of teamwork among nursing staff.

The instrument was designed for an acute care setting and consists of 33 items grouped into five subscales: trust (seven items), team orientation (nine items), backup (six items), shared mental model (seven items) and team leadership (four items). The responses are recorded using a frequency scale (1 – rarely; 2 – 25% of the time; 3 – 50% of the time; 4 – 75% of the time; 5 – always). Negatively worded items were recoded. A higher score means a more positive evaluation of teamwork. The instrument also consists of several sociodemographic data items including respondent and hospital characteristics such as, age, education, professional experience in total, professional experience in the current position, job position, satisfaction with the current job, unit type etc.

Data analysis

Data were analyzed in the SPSS 25.0 statistical program. Descriptive statistics (mean, frequency, SD) were used for the sample characteristics and the NTS instrument. The missing values ranged between 0.2% and 0.4%, indicating a high acceptability of the instrument. Differences in teamwork evaluation based on selected sociodemographic variables were analyzed using nonparametric tests (Mann-Whitney U test, Kruskal-Wallis test) based on the results of the normality test. The Spearman correlation coefficient was used to analyze relationships between teamwork and selected ordinal variables (quality evaluation, overall patient safety degree, number of patients). We also used multiple linear regression analysis to assess predictors of teamwork evaluation. All results were tested at a level of $p < 0.05$. The reliability of the NTS was evaluated by the value of the Cronbach alpha coefficient (α), which at 0.919 indicated that the NTS could be considered a reliable instrument.

Results

The study included 292 respondents, representing members of the nursing team of a teaching hospital in the Slovak Republic. Sample characteristics are reported in Table 1.

Evaluation of teamwork among nursing staff

The mean composite score of the NTS instrument was 2.88 ± 0.57 (out of 4), indicating a prevalence of ideal teamwork less than 75% of the time (Table 2). The most highly rated subscale was Shared Mental Model (3.23 ± 0.76), followed by Backup (3.09 ± 0.67). In contrast, the Team Orientation subscale achieved the lowest score in the evaluation (2.38 ± 0.75). The best-evaluated item was ‘My team believes that to do a quality job, all members need to work together’ (3.45 ± 0.53; 83.4%). Contrarily, the lowest score was awarded to the item ‘Staff member with strong personality dominates team decisions’ (1.35 ± 1.27; 16.1%).

Factors influencing the evaluation of teamwork among nursing staff

Using the Kruskal-Wallis test, several factors influencing the evaluation of teamwork among staff were identified in the study (Table 3). Nursing staff who had a master’s degree in nursing (or a doctorate) awarded the highest score to the Team Orientation subscale ($\chi2 = 9.23$, $p = 0.026$, $df = 3$). With regard to job position, nursing assistants awarded the highest score to the Team Leadership subscale ($\chi2 = 11.06$, $p = 0.026$, $df = 4$). Nursing staff with professional experience (overall, current) of less than six months

Table 1 Sample characteristics (n = 292)

Variable		N = 292	%
Gender	male	26	8.9
	female	266	91.1
Age	less than 25 years	25	8.6
	25 to 34 years	45	15.4
	35 to 44 years	72	24.7
	45 to 54 years	106	36.3
	more than 55 years	44	15.0
Education	secondary vocational education	112	38.4
	higher education	57	19.5
	bachelor degree	64	21.9
	master degree or higher	58	20.2
Professional experience in the current unit (years)	less than 6 months	25	8.6
	more than 6 months, less than 2 years	37	12.7
	more than 2 years, less than 5 years	53	18.2
	more than 5 years, less than 10 years	50	17.1
	more than 10 years	127	43.5
Total professional experience (years)	less than 6 months	18	6.2
	more than 6 months, less than 2 years	28	9.6
	more than 2 years, less than 5 years	47	16.1
	more than 5 years, less than 10 years	48	16.4
	more than 10 years	151	51.7
Unit type	medical disciplines	82	28.1
	surgical disciplines	88	30.1
	intensive care disciplines	101	34.6
	other, non-specified	21	7.2
Job position	nurse aid	61	20.9
	nursing assistant	38	13.0
	nurse	69	23.6
	nurse specialist	101	34.6
	nurse manager / senior staff nurse	23	7.9
Overtime hours in past 3 months	none	38	13.0
	less than 12 hours	50	17.1
	more than 12 hours	204	69.8
Perceived staff adequacy	0 % of the time (not adequate at all)	28	9.6
	25 % of the time	47	16.1
	50 % of the time	111	38.0
	75 % of the time	73	25.0
	100 % of the time (fully adequate)	33	11.3
Intention to leave current position	yes, in the next 6 months	19	6.5
	yes, in the next year	18	6.2
	no intention to leave	255	87.3

Table 2 Evaluation of teamwork among nursing staff

Dimensions of teamwork	Min	Max	Median	M	SD
Trust	1	4	3	2.90	0.79
Team orientation	1	4	2	2.37	0.75
Backup	1	4	3	3.09	0.67
Shared mental model	1	4	3	3.23	0.75
Team leadership	1	4	3	2.99	0.76

M – mean; SD – standard deviation; Min – minimum; Max – maximum

awarded the highest score to the Trust ($\chi2 = 12.54$, $p = 0.014$, $df = 4$; respectively $\chi2 = 12.12$, $p = 0.016$, $df = 4$) and Team Orientation subscales ($\chi2 = 13.01$, $p = 0.011$, $df = 4$; respectively $\chi2 = 13.94$, $p = 0.007$, $df = 4$), and to Overall Evaluation of Teamwork ($\chi2 = 12.20$, $p = 0.016$, $df = 4$; respectively $\chi2 = 13.18$, $p = 0.010$, $df = 4$). In addition, nursing staff without any intention to leave the position awarded the highest scores to Overall Evaluation of Teamwork ($\chi2 = 9.06$, $p = 0.011$, $df = 2$) Trust ($\chi2 = 7.12$, $p = 0.028$, $df = 2$) and Team Orientation ($\chi2 = 10.87$, $p = 0.004$, $df = 2$). Nursing staff who

Table 3 Differences in teamwork evaluation based on selected variables (Kruskal-Wallis test) (Part 1)

Variables	M_{rank}	NTS1	NTS2	M_{rank}	NTS3	M_{rank}	NTS4	M_{rank}	NTS5	M_{rank}	NTS score	M_{rank}
Education												
secondary vocational education	150.67		128.64		140.32		139.76		153.95		136.74	
higher education	157.92	p = 0.209	151.18	p = 0.026*	163.24	p = 0.168	144.12	p = 0.574	149.42	p = 0.275	156.53	p = 0.379
bachelor degree	128.04		149.48		132.23		144.91		142.88		142.27	
master degree or higher	142.53		168.49		152.85		158.81		127.92		155.32	
Job position												
nurse aid	157.43		137.08		147.44		154.34		168.70		147.90	
nursing assistant	147.86	p = 0.497	131.78	p = 0.369	153.74	p = 0.578	133.01	p = 0.773	169.74	p = 0.026*	144.92	p = 0.832
nurse	131.43		145.17		143.19		143.48		131.55		137.71	
nurse specialist	149.59		153.48		140.00		147.12		137.46		149.18	
nurse manager / senior staff nurse	146.89		169.15		170.54		154.30		133.78		160.00	
Professional experience (overall)												
less than 6 months	206.92		203.08		186.42		175.17		188.25		207.31	
more than 6 months, less than 2	134.32		142.73		145.48		137.63		156.14		144.13	
years	128.91	p = 0.014*	119.61	p = 0.011*	136.81	p = 0.282	121.53	p = 0.123	155.26	p = 0.145	125.87	p = 0.016*
more than 2 years, less than 5 years	138.33		149.13		151.39		154.98		141.11		144.06	
more than 5 years, less than 10 years	149.63		147.99		143.39		149.80		138.72		146.89	
more than 10 years												
Professional experience (current)												
less than 6 months	197.54		188.20		188.50		173.70		187.22		199.34	
more than 6 months, less than 2	138.18		137.14		144.91		135.92		157.14		143.45	
years	129.51	p = 0.016*	119.92	p = 0.007*	137.81	p = 0.128	133.92	p = 0.215	151.42	p = 0.063	126.15	p = 0.010*
more than 2 years, less than 5 years	139.43		163.80		147.02		160.11		138.31		150.79	
more than 5 years, less than 10 years	148.75		145.30		142.12		144.12		136.56		143.79	
more than 10 years												
Intention to leave												
yes, in the next 6 months	124.55	p = 0.028*	96.55	p = 0.004*	122.18	p = 0.221	108.13	p = 0.093	121.74	p = 0.274	104.87	p = 0.011*
yes, in the next year	99.19		108.61		121.69		128.47		125.78		106.53	
no intention to leave	148.70		150.15		147.26		147.84		147.00		149.67	

**p ≤ 0.005; M_{rank} – mean rank (the average of the ranks for all observations within each sample); NTS – Nursing Teamwork Survey; NTS1 – Trust; NTS2 – Team orientation; NTS3 – Backup; NTS4 – Shared mental model; NTS5 – Team leadership*

Table 3 Differences in teamwork evaluation based on selected variables (Kruskal-Wallis test) (Part 2)

Variables	M_{rank}	NTS1	NTS2	M_{rank}	NTS3	M_{rank}	NTS4	M_{rank}	NTS5	M_{rank}	NTS score	M_{rank}
Overtime hours												
none	155.51	p = 0.751	158.64	p = 0.423	152.38	p = 0.757	152.53	p = 0.859	136.84	p = 0.087	154.55	p = 0.560
less than 12 hours	145.67		153.23		150.89		142.90		169.52		153.69	
more than 12 hours	144.30		141.85		143.60		145.84		141.92		142.50	
Staff adequacy												
0 % of the time (not adequate at all)	153.59	p = 0.030*	138.16	p = 0.149	158.32	p = 0.007*	157.07	p = 0.008*	148.38	p = 0.063	152.27	p = 0.005*
25 % of the time	114.39		124.91		114.07		111.81		119.93		110.68	
50 % of the time	143.19		136.58		135.01		139.22		136.14		137.36	
75 % of the time	143.21		157.90		153.20		148.28		155.15		153.81	
100 % of the time (fully adequate)	177.76		161.76		180.22		181.58		169.68		181.20	
Age												
less than 25 years	136.78	p = 0.093	150.96	p = 0.637	146.26	p = 0.486	127.20	p = 0.077	146.12	p = 0.876	143.32	p = 0.507*
25 to 34 years	116.67		141.43		135.13		122.22		135.59		126.71	
35 to 44 years	146.94		158.74		154.67		146.13		147.20		154.21	
45 to 54 years	154.75		140.04		139.01		151.26		151.17		146.77	
more than 55 years	158.91		141.24		159.93		168.72		142.07		152.10	
Unit type												
medical disciplines	143.29	p = 0.515	126.10	p = 0.054	139.71	p = 0.550	134.52	p = 0.115	155.99	p = 0.612	131.57	p = 0.124
surgical disciplines	140.06		149.15		144.43		140.49		139.63		143.93	
intensive care disciplines	156.52		160.50		155.83		162.67		143.78		161.31	
other, non-specified	137.81		147.71		136.83		140.69		151.31		144.36	

**p ≤ 0.005; M_{rank} – mean rank (the average of the ranks for all observations within each sample); NTS – Nursing Teamwork Survey; NTS1 – Trust; NTS2 – Team orientation; NTS3 – Backup; NTS4 – Shared mental model; NTS5 – Team leadership*

perceived staffing to be adequate at all times during their last shift awarded the highest score to Overall Evaluation of Teamwork ($\chi2 = 14.82$, $p = 0.005$, $df = 4$), and to the subscales of Trust ($\chi2 = 10.67$, $p = 0.030$, $df = 4$), Backup ($\chi2 = 14.21$, $p = 0.007$, $df = 4$), and Shared Mental Model ($\chi2 = 13.73$, $p = 0.008$, $df = 4$).

Using Spearman's correlation analysis, several factors associated with teamwork evaluation were identified in our study (Table 4). Satisfaction with Teamwork, Subjective Evaluation of Quality Care, and Patient Safety were positively and significantly associated with all subscales of teamwork, as well as with the overall evaluation of teamwork. As scores for these variables, increased the evaluation of teamwork also increased for particular subscales. Job Satisfaction in Current Position was also positively and significantly related to Overall Evaluation of Teamwork and the Trust, Team Orientation, and Team Leadership subscales.

Predictors of the evaluation of teamwork among nursing staff

Multiple regression analysis was conducted to examine the relationship between the average composite score of teamwork and individual variables (unit type, education, age, job position, professional experience (overall, current), perceived adequacy of staff, number of admissions and discharges of patients, overtime hours, intention to leave the position, overall job satisfaction, satisfaction with the current job, subjective assessment of quality and overall degree of patient safety), thus revealing predictors of teamwork among nursing staff (Table 5). Model 1 ($R2 = 0.626$; Adj $R2 = 0.392$; $F = 7.276$; $p < 0.000$) revealed five significant predictors that explained 39.2% of the variability in teamwork. As a result of the positively reported standardized beta coefficient, nursing staff who were older ($\beta = 0.141$; $p < 0.047$), without intention to leave the position ($\beta = 0.135$; $p < 0.025$), who were generally satisfied with the job ($\beta = 0.142$; $p < 0.033$) and with teamwork ($\beta = 0.374$; $p < 0.000$), and who evaluated higher quality of care ($\beta = 0.162$; $p < 0.015$) also awarded higher scores in the Overall Evaluation of Teamwork.

Table 4 Associations between selected variables and teamwork (Spearman correlation coefficient)

Variables	NTS score	NTS1	NTS2	NTS3	NTS4	NTS5
Job satisfaction with current position	0.245**	0.229	0.150*	0.268**	0.101	0.234**
Overall job satisfaction	0.056	0.067	0.003	0.096	0.002	0.120*
Satisfaction with teamwork	0.468**	0.396**	0.334**	0.401**	0.430**	0.289**
Subjective evaluation of quality	0.290**	0.207**	0.236**	0.229**	0.246**	0.276**
Overall patient safety degree	0.259**	0.200**	0.221**	0.268**	0.167**	0.148*
Number of patient admissions	0.059	0.077	0.033	0.035	0.092	0.079
Number of patient discharges	–0.006	0.043	–0.004	–0.054	0.057	0.012

**p ≤ 0.005; **p ≤ 0.001; NTS – Nursing Teamwork Survey; NTS1 – Trust; NTS2 – Team orientation; NTS3 – Backup; NTS4 – Shared mental model; NTS5 – Team leadership*

Table 5 Results of a multiple regression analysis: predictors of teamwork among nursing staff

Variables	NTS score	
	β	p value
Unit type	-0.105	0.075
Education	-0.002	0.974
Age	0.141	0.047*
Job position	0.014	0.854
Professional experience – overall	0.065	0.526
Professional experience – current	-0.192	0.056
Overtime hours	-0.018	0.788
Intention to leave the position	0.135	0.025*
Perceived staff adequacy	0.062	0.279
Number of patient admissions	0.104	0.183
Number of patient discharges	-0.025	0.748
Satisfaction with the current position	0.074	0.313
Overall job satisfaction	0.142	0.033*
Satisfaction with teamwork	0.374	0.000*
Evaluation of quality of nursing care	0.162	0.015*
Evaluation of overall patient safety	0.106	0.107

**p ≤ 0.005; β – Standardized beta coefficient; NTS – Nursing Teamwork Survey*

Discussion

Effective teamwork is a basic requirement for the provision of safe and quality care. It is necessary to realize that nursing care is not provided exclusively by nurses at the bedside, but by the entire nursing team, which includes several professions. The quality and safety of nursing care are influenced by professional skills and nursing knowledge, but also by the soft skills demonstrated in teamwork and its dimensions. Teamwork also leads to an improvement in the atmosphere at work (Kalisch et al., 2010). The purpose of the study was to find out what level of teamwork is present in the nursing team in selected departments of a teaching hospital and what factors influence the evaluation of the level of teamwork.

In our study, the level of teamwork (as assessed by the average composite score) achieved the value of 2.88 / 4.0 ± 0.57 meaning that ideal teamwork was perceived less than 75% of the time. Similar results were also reported in Australia when the tool was used in the environment of a private facility (2.97 ± 0.82; Costello et al., 2021), and also in the United States (2.52 ± 0.54; Kalisch et al., 2010) and Turkey (2.15 ± 0.57; Eskici & Baykal, 2021). The most highly rated subscale was the Shared Mental Model subscale (3.23 ± 0.76), which achieved a higher score than in international studies (3.05 ± 0.74; Costello et al., 2021; 2.96 ± 0.58, Kalisch & Lee, 2013; 2.64 ± 0.88, Eskici & Baykal, 2021). This fact reflects the good set-up of processes within handovers and patient transitions and also good relationships in nursing teams. In contrast, the Team Orientation subscale achieved the lowest score in our study (2.38 ± 0.75), which indicates less effective conflict resolution, and provision or receipt of feedback, and the prioritizing of personal goals over common team goals, which is also in line with the American (2.32 ± 0.74; Kalisch & Lee, 2013) and Turkish studies (1.21 ± 0.74 Eskici & Baykal, 2021).

Statistically significant differences in the evaluation of teamwork were confirmed in our study according to education, job position, working hours, professional experience (both in general and in the current workplace), intention to leave, and perceived staff adequacy. In the study by Kalisch and Lee (2013), differences in teamwork assessment were identified relating to the work schedule, with nurses who had only night shifts rating teamwork more positively. In the context of the Slovak Republic, such a work schedule is uncommon. The authors also observed variability in evaluations according to perceived staff adequacy and job position. Contrary to our study, differences in absenteeism, working hours (part-time), and professional experience were not statistically significant.

An important factor influencing the evaluation of teamwork was education, which is consistent with the study by Kakemam et al. (2021). The results of this study showed that nurses with a higher level of education had a more positive perception of teamwork than those with a lower level of education. The authors also found that nurses who had participated in teamwork courses or training had more favorable attitudes towards interprofessional collaboration than nurses who had not received such training. The study findings suggest that education and training can positively influence nurses' perceptions of teamwork and collaboration, which are key to providing quality patient care. The importance of education in connection with functioning in a team is also emphasized by the Canadian authors, Barton et al. (2018), who consider it necessary to increase competencies in teamwork by including it in the educational process and creating training for nurses in practice, while highlighting the benefits of training using simulation.

In terms of age, teamwork was rated more highly by respondents over 55 years of age, and in the 35–44 year age range, while the lowest rating was awarded by the group aged 25–34 years. However, nursing teams consist of people of different age groups. Williams (2016) investigated how generational age diversity affects trust among team members. The author claims that, while generational diversity can have a positive effect on trust in some situations, it can also undermine trust in other situations. This is because team members from different age groups bring different perspectives, knowledge, and skills, which can lead to more creativity and innovation, and ultimately more trust between team members. At the same time, individuals of different ages have different work values, attitudes, and communication styles. These differences can lead to misunderstandings and conflicts that can erode trust and reduce team effectiveness (Douglas et al., 2015).

Another confirmed factor in our study was job position, whereby nurse managers and senior staff nurses rated teamwork most positively. However, when evaluating the dimension of team leader, they were more critical than nurse aids, nursing assistants, and nurse specialists. Nurse managers are in a position to resolve conflicts within the team or between teams. In this position, they should approach conflict solving objectively and not try to avoid them, since unresolved conflicts can have an impact on ensuring safe and quality nursing care.

The American Association of Nursing Executives offers the possibility of training with the aim of improving conflict resolution through managerial competencies (Grubaugh & Flynn, 2018). Furthermore, Atwal and Caldwell (2006) investigated perceptions of teamwork among nurses in different positions. The results showed that nurse specialists perceived multidisciplinary teamwork as an essential part of providing quality patient care. They emphasized the importance of effective communication, cooperation, and respect for the role and expertise of each team member. Therefore, nurse managers should integrate nurse specialists into nursing teams across all disciplines (Rosen et al., 2018).

Another important factor influencing the perception of teamwork among members of the nursing team was the perceived adequacy of staffing. Kalisch and Lee (2013) put emphasis on adequate staffing in the workplace, since lack of staff creates time scarcity in the provision of nursing care. In such a situation, team members tend to focus only on themselves and their workload rather than taking on the responsibilities and goals of the entire team. A close relationship between teamwork and quality of care was also demonstrated within the regression analysis, with perceived quality of nursing care confirmed as a predictor along with age, intention to leave, satisfaction with the profession as a whole, satisfaction with the team, and perceived patient safety. Several studies point to the connection between teamwork and patient safety, which is the main reason to highlight the importance of teamwork (Alkhaqani, 2022; Babiker et al., 2014). Increasing competence and knowledge, communicating more effectively, building mutual trust, ensuring adequate staffing, a fairer delegation of tasks, and increasing team awareness can support teamwork and lead to its better evaluation among nursing staff.

Limitation of study

The study has several limitations. The first limitation is the inclusion of only one selected hospital and the small sample size (n = 292). A second limitation might be the item in the NTS reflecting the roles and responsibilities of nurse assistants, since they are not employed in every department.

Conclusion

This study sheds light on the state of teamwork among nursing staff in a teaching hospital in the Slovak Republic and the various factors influencing its evaluation. The findings indicate that there is room for improvement in fostering ideal teamwork, as the average composite score indicated that it was perceived less than 75% of the time, suggesting that there is still work to be done in enhancing collaborative practices. Notably, Shared Mental Model emerged as a strong point in the assessment, reflecting well-established processes within handovers and patient transitions, as well as positive relationships within nursing teams. On the flip side, the Team Orientation subscale lagged behind, indicating potential areas for improvement in conflict resolution, feedback exchange, and prioritizing common team goals over personal objectives.

In summary, this research underscores the significance of teamwork in nursing care, emphasizing that it involves not only professional skills and knowledge but also the soft skills essential for effective collaboration. The findings provide valuable insights into the factors influencing teamwork within nursing teams such as education levels, job positions, professional experience, and perceptions of adequacy of staffing, paving the way for targeted interventions and training programs aimed at enhancing teamwork and, ultimately, improving the quality and safety of patient care. Addressing these factors and fostering a culture of open communication, trust, and shared goals are essential to creating an environment in which ideal teamwork is the norm rather than the exception.

Ethical aspects and conflict of interest

The study was approved by the Ethics Committee of the Jessenius Faculty of Medicine, Martin, and Comenius University, Bratislava (EC 93/2021). The demographic data of the participants were processed in accordance with the regulation of the European Parliament and the EU Council 2016/679 of 27. 04. 2016 on the protection of persons in connection with the processing of personal data and the free movement of such data.

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Author contributions

Conception and design (DK, ŽH), data collection (DK, ŽH), data analysis and interpretation (DK, ŽH), manuscript draft (DK, ŽH), critical revision of the manuscript (DK, ŽH), final approval of the manuscript (DK, ŽH, KŽ).

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