



# Health Service Quality and its Relationship to Team Collaboration and Communication during the COVID-19 Pandemic

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## Abstract

**BACKGROUND:** In the search for innovative methods to improve the quality and efficiency of health services, integrated clinical pathways (ICPs) have been introduced.

**AIM:** As there is a gap in research on ICP efficiency, the aim of the study was to investigate the role and impact of collaboration and communication among three interprofessional ICP teams on the self-assessment of efficiency of ICPs.

**METHODS:** A cross-sectional study was conducted using a descriptive quantitative with a survey (n = 152) and qualitative methods with a focus group (n = 27) and in-depth interviews (n = 22) in a typical general hospital in Slovenia.

**RESULTS:** The results showed that health-care professionals found patient health care and the work of health-care professionals' better quality with ICP than without ICP. The ICPs team members assessed communication, cooperation, and effectiveness in the ICP team as relatively good but identified the lack of staff as the main reason for their limitations. The impact of ICP team collaboration and communication on ICP safety exists but it does not explain a sufficient proportion of the variance and the correlation is medium strong. The result also revealed that the COVID-19 pandemic did not primarily affect ICP team members' fear of possible infection, as studies have shown in the first wave of the COVID-19 pandemic, but rather staff shortages leading to increased fear of errors and possible complaints and lawsuits from patients and relatives.

**CONCLUSION:** Measures are needed for the additional employment of team members and the retention of current staff through financial compensation and the promotion of supportive workplace characteristics.

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## Introduction

Hospitals, as the most important element of the health-care system, are responsible for providing quality and safe health care to patients and creating a safe working environment for health-care professionals and other workers [1]. In the search for innovative methods to improve the quality, safety, and efficiency of health services, integrated clinical pathways (ICPs) have been introduced [2], [3], [4]. Although there is no single definition of ICPs, it can be described as a complex intervention for shared decision-making and organization of health-care processes for a well-defined group of patients during a well-defined period of time, including an explicit statement of the goals and key elements of care based on evidence, best practice, and patients' expectations and characteristics [5], [6], [7]. ICPs enable transparent documentation, monitoring and evaluation of various deviations or outcomes, involvement of patients and their relatives, and greater satisfaction among employed health-care professionals and patients [6]. The main objective of implementing ICPs in clinical settings is also to prevent or minimize avoidable harm to patients [8], [9], [10], that is, to improve

patient safety and enhance the safety of healthcare professionals by anticipating, identifying, assessing, and controlling hazards in or from the workplace that could affect the health and well-being of workers [11].

A systematic review of the literature on the safety culture among health-care professionals reveals that good interprofessional teamwork and effective communication between health-care professionals in general are essential component of safety culture in any organization [12], [13], defined as shared values, attitudes, perceptions, competencies, and behaviors related to safety among members of the organization [10]. The active and competent collaboration of the individual health professional in interprofessional teams include his or her contribution of expertise and skills to solve complex health challenges, sharing relevant information, and coordinating appropriate health decisions. More specifically, team members inform each other about changes in the patient's health, plan, and coordinate work together, make decisions together, and successfully solve problems by asking another competent person in the team for their opinion when making decisions [14], [15], [16].

Communication in an interprofessional team influences collaboration in that team and vice versa [17].

Communication for successful collaboration includes addressing, listening, receiving, and sharing information with team members [16]. Good communication in an interprofessional team is not limited to formal communication, whether in the form of overwhelming conflictual or passive, but all team members should be equally involved in team communication [3], [17]. At the individual level, team members are able to express their opinion easily in the team, solve the problem easily, and listen to the opinions of other team members [17]. Since no study has yet been conducted on the impact of interprofessional collaboration and communication on ICP effectiveness, the question arises as to how collaboration and communication in an interprofessional ICP team (which includes both the patients and the health-care professionals) affects the ICP efficiency. Due to the aging population and the associated presence of joined and commonly treated conditions in older patients such as, for example, joint presence chronic kidney disease, stroke, and total hip arthrosis [18], [19], [20], [21], it is important to explore the perception of occupational by medical professionals in these ICPs effectiveness of these ICPs. As there is a research gap in the field of ICP safety, the aim of the study was to investigate the role and influence of collaboration and communication in three interprofessional ICP teams on the self-assessment of ICP effectiveness in a typical Slovenian hospital.

## Methods

A cross-sectional study was conducted using a descriptive quantitative method with a survey and qualitative methods with a focus group and in-depth individual interviews. Data collection was part of the project "Impact of integrated clinical pathways on patient outcomes, communication, and cost-effectiveness" funded by the National Research Agency (No. L7-2631-3824-2020). The research was approved by the National Medical Ethics Committee (No. 0120-189/2021/3).

### Quantitative approach

At the request of respondents, the questionnaire was distributed in printed and online form. The completed questionnaires were collected from June

7, to July 15, 2021, in the Nephrology, Neurology, and Orthopedics Departments of the General Hospital Novo mesto.

One hundred and fifty-two questionnaires were completed. The sample was dominated by women ( $n = 124$ , 82 %). Most (54 %) of the respondents were in the group of 21–40 years old. About 38.2 % of the respondents had tertiary education, 34% had secondary education, 10.4% had a university degree, 11.8 % had a specialization/master's degree, and 3.5 % had a PhD. The majority of respondents were members of an interprofessional team following the clinical pathway for the treatment of chronic kidney disease ( $n = 57$ , 39.6 %), and the fewest in an interprofessional team following the clinical pathway for the treatment of stroke ( $n = 35$ , 24.3 %).

To collect the non-general data, we used a structured questionnaire, based on the questionnaire of Cramm and Nieboer study [18], adapted and supplemented for the needs of our research. The first question included six statements about the individual's collaboration with specific members of the interprofessional team, which participants rated on a five-point scale from 1 ("Never") to 5 ("Very often") (Table 1). The second set of questions measured the ICP team communication and communication of individuals in ICP team (Table 2) with a five-point scale from 1 ("I don't agree at all") to 5 ("I totally agree"). The third question measured the efficiency of ICP by measuring agreement with the statement that "patient health care and the work of health-care professionals are better (more effective) with ICP than without ICP" (from 1, "I don't agree at all", to 5, "I totally agree"). The reliability of the instrument was acceptable ( $\alpha = 0.83$ ). The questionnaire was translated from the original English version into Slovenian and then back into English. We compared the translation with the original, harmonized the discrepancies in content, and adapted it to the Slovenian context. The questionnaire was reviewed and commented on by seven health-care professionals from the clinical setting, after which a pilot study was conducted ( $n = 50$ ).

We used descriptive statistics, factor analysis, and multiple linear regression analysis, where all assumptions were satisfied (linear relationship, multivariate normality, no multicollinearity, and homoscedasticity).  $p < 0.05$  determined the limit of the statistical significance. Statistical analysis was performed using SPSS, version 23.0 (SPSS Inc., Chicago, IL, USA).

**Table 1: Assessment of collaboration in ICP team**

Statements	Answers										$\bar{x}$	SD
	Never		Rarely		Occasionally		Frequently		Very Often			
	f	%	f	%	f	%	f	%	f	%		
As a member of team, I rely on documentation to monitor the patient's medical condition.	3	2.2	0	0.0	15	10.9	35	25.5	84	61.3	4.4	0.86
When I make decisions, I ask another competent person in the team for an opinion.	0	0.0	9	6.6	16	11.7	37	27	75	54.7	4.3	0.92
Team members inform each other about changes in the patient's health.	1	0.7	0	0.0	8	5.8	24	17.5	104	75.9	4.7	0.65
As part of the team, members exchange opinions on the necessary activities for the patient.	2	1.5	4	2.9	12	8.8	29	21.2	90	65.7	4.5	0.88
Team members plan and coordinate work together.	0	0.0	3	2.2	7	5.1	32	23.4	95	69.3	4.6	0.69
Team members make important decisions together and solve problems successfully.	0	0.0	2	1.5	8	5.9	31	22.8	95	69.9	4.6	0.67

**Table 2: Assessment of ICP team communication.**

Statements	Answers										x̄	SD
	I do not agree at all		I do not agree		I cannot decide		I agree		I completely agree			
	f	%	f	%	f	%	f	%	f	%		
<b>Team communication</b>												
Communication in the team is limited to formal communication.	13	9.3	80	57.1	18	12.9	22	15.7	7	5.0	2.5	1.03
Conflictual communication prevails among team members.	27	19.0	87	61.3	15	10.6	7	4.9	6	4.2	2.1	0.93
Team members mostly communicate passively (react poorly).	28	19.9	85	60.3	14	9.9	12	8.5	2	1.4	2.1	0.87
All team members are equally involved in team communication.	3	2.1	21	15.0	22	15.7	62	44.3	32	22.9	3.7	1.05
<b>Communication of individuals in ICP team</b>												
I can easily express my opinion among team members.	0	0.0	7	4.9	18	12.7	74	52.1	43	30.3	4.1	0.79
The team members listen to my opinion.	1	0.7	11	7.7	16	11.3	79	55.6	35	24.6	4.0	0.86
By communicating in a team, I can easily solve a problem.	3	2.1	5	3.5	22	15.5	72	50.7	40	28.2	4.0	0.88

**Qualitative study**

Qualitative methodology offers the opportunity to explore topics and add to our understanding of the phenomena of ICP effectiveness. All health-care professionals treating patients with chronic kidney disease, stroke, and total hip arthroplasty at General Hospital Novo mesto invited to participate in focus groups and 27 were responded. Three focus groups were conducted with 8–10 nursing assistants and registered nurses in each group. The purpose of using the focus group was to verify the data obtained from a quantitative survey and to identify the reasons for the gaps in communication identified. We conducted 22 in-depth interviews with physicians (10), head nurses (4), physiotherapists (2), psychologists (1), social workers (1), pharmacists (1), clinical dietitians (1), clinical pharmacists (1), and health administrators (1). Focus groups and in-depth interviews were conducted in September and October 2021 at General Hospital Novo mesto. Two main questions were asked, namely, what is the role of communication and collaboration in the ICP team and ICP quality and what influence communication and collaboration in the ICP team have on ICP effectiveness. The focus group and in-depth interviews discussions were recorded with prior consent of the participants and the (anonymized) statements of the participants were transcribed.

The data were analyzed using thematic analysis. Due to the limited textual possibilities to present qualitative results, we only present those findings of the qualitative analysis that explains or further illuminates the results of the quantitative analysis.

**Results**

Table 1 shows that the assessment of collaboration between members of the ICP team is relatively high. The majority of respondents are most likely to inform each other about changes in the patient's health status (93.4 %), asking another competent person in the team for an opinion on decisions is the least likely (81.7 %).

Table 2 shows that the assessment of ICP team communication is relatively high. The majority of

respondents believe that there is no conflictual (80.3 %) or passive (80.2 %) communication among team members. The results also showed that 82.4 % of them can easily express their opinion in the team, 80.2 % of them reported that their opinion is heard and 78.9 % can easily solve a problem through team communication. About 67.2 % of all team members reported that they are equally involved in team communication.

Figure 1 shows that majority of respondents (71.5 %) (completely) agree with the statement that the treatment of patients and the work of health-care professionals is more efficient under ICP than without ICP.

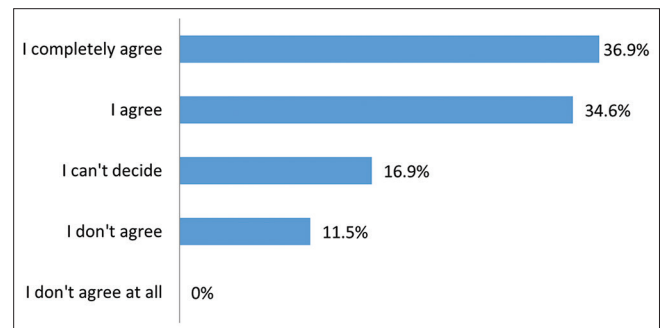


Figure 1: Self-assessment of ICP safety

Due to the large number of variables, we used factor analysis, which is a data reduction method that allowed us to examine the relationships between different variables. The validity of the factor analysis was tested for sphericity using Bartlett's test, and the characteristic level was less than 0.05 (p = 0.000) in all cases. The list of variables and the results of the factor analysis are shown in Table 3.

We continued with a multiple linear regression designed to test the impact of collaboration, team communication, and individual communication on

**Table 3: Factor analysis results**

Factor	Included variables	% of variance	p
Collaboration	Reliance on documentation	64.48	0.000***
	Asking for opinion		
	Informing others about changes		
	Exchange of views		
	Joint planning and coordination of work		
Team communication	Joint decision-making	71.47	0.000***
	Formal communication		
	Conflict communication		
	Passive communication		
Communication of individuals	Equal communication	79.67	0.000***
	Easy to express my opinion		
	Others listen to my opinion		
	Easy conflicts solving		

\*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001.

ICP safety. The calculation showed that the multiple correlation coefficient is equal to 0.439, which means that the dependence between cost efficiency and the three independent variables is medium strong. The multiple coefficient of determination is equal to 0.462, which means that 46.2% of the variance of ICP effectiveness is explained by the linear influence of collaboration between the members of the multidisciplinary team, team communication, and individual communication. The F-test value is 3.093, and because the significance level is lower than 0.05 ( $p = 0.029$ ), we reject the null hypothesis and accept the conclusion that at least one of the partial regression coefficients is different from zero.

Regression analysis shows that collaboration between ICP team has the strongest influence on the ICP safety, followed by communication of individuals in ICP team, whereas team communication was not statistically significant (Table 4).

**Table 4: Influence of collaboration and communication in ICP team on ICP effectiveness**

Variables	B	SE	$\beta$	t	p
Constant	3.985	0.097		41.117	0.000*
Collaboration	0.227	0.104	0.201	2.193	0.030*
Team communication	0.100	0.115	0.089	0.087	0.061
Communication of individuals in ICP team	0.168	0.119	0.150	1.409	0.033*

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

The in-depth individual interviews and focus group interviews revealed that most members of the ICP team consider ICP implementation important, because selecting, documenting, and monitoring the best patient care reduce the risk of medical and other errors and increases patient safety and well-being and thus staff safety and well-being, which is mainly understood as minimizing internal pressures (fear of making avoidable harm to patients) and especially external pressures (complaints and lawsuits from patients and their families). A typical statement came from an orthopedist:

“Yes, implementing a clinical pathway is important for patient safety and for us because we choose the best treatment and write it down and tick it off as we work on it. This minimizes medical errors and as many other mistakes as possible. This increases patient safety, and we must not forget our safety either. Let me emphasize that this will reduce complaints from patients and relatives and possible lawsuits, which have put a lot of pressure on medical staff lately. And also, our fear of making mistakes. That is why it is so important!”

In addition to the general view that communication, collaboration and ICP effectiveness are in general good and interlinked, respondents pointed out that the main reason for not implementing all three factors optimally is the lack of staff. The nurse’s statement was typical:

“We are trying to work as well as we can, and in general, communication is good, as a lot of progress has been made with the introduction

of the clinical pathway, but we are all suffering from staff shortages. Especially now that, we are dominated by COVID-19. It used to be almost unbearable, but now it is really bad. The fewer we are, the less we work together, the less we communicate and the quicker we make mistakes, then there are conflicts, but also worse cooperation and an even greater likelihood of mistakes. Everything is interconnected.”

## Discussion

The combination of methods was useful as it provided a broader and deeper insight into the ICP safety. The results of survey indicated that ICP team members assessed communication, collaboration, and ICP effectiveness as relatively good. The multiple linear regression analysis showed that cooperation and individual communication in the ICP team has influence on ICP safety, but they explain only 46.2 % of variance, which means that there are also other determinants which have an influence on it and were not included in the study. The in-depth individual interviews and focus group interviews confirmed the importance of ICP implementation to ensure both patient and team member safety. They suggested that ICP effectiveness is complexly understood as the prevention or reduction of diagnostic errors, medical errors, injuries, or other preventable harm to a patient during the process of quality health-care delivery and unnecessary harm related to health-care delivery [22] and the hazards or threats in the clinical work environment as biological, physical, ergonomic, chemical, and psychological risks [23]. Surprisingly, the focus of understanding team member safety despite the COVID-19 pandemic was not on preventing COVID-19 infections, as studies in the first wave of the COVID-19 pandemic showed [24], but primarily on preventing complaints and lawsuits from patients and their families. This can be explained by the fact that health professionals in spring and autumn 2021 have already become accustomed to or have already taken COVID-19 prevention measures into account. However, the respondents’ statements clearly show that the impact of the pandemic is reflected in the absence of team members and consequently in increased pressure or fear of making avoidable harm to patients. According to the respondents, the risk of a patient being harmed by them has increased due to staff shortages during this period, causing additional internal (fear of causing avoidable harm), and external pressures (fear of complaints from patients and relatives). This is also consistent with the findings of studies from similar cultural settings such as Austria [25], Croatia [26], and Slovenia [27] that showed that the number of patient complaints has increased in recent decade and that the

pressure on health-care professionals has increased significantly [28].

The shortage of physicians and nurses is one of the biggest challenges for our health system, as outlined in State of Health in the EU: Slovenia [29], as the number of physicians in our country (3.1 per 1 000 inhabitants) is far below the EU average and the number of nurses includes nurses who have only completed vocational training and do not comply with the Directive on Regulated Health Professions [30]. Therefore, maintaining health professions will benefit from the additional employment of team members and the retention of current staff through financial compensation and the promotion of supportive workplace characteristics.

Although this is the first study to examine the impact of ICP team communication and collaboration on ICP safety, this study also has some limitations. The biggest one is that we only conducted the study in a single hospital. Although it is a typical general hospital, we cannot generalize the results to all general hospitals in our country and beyond. The results can only give us an insight into the challenges of implementing ICPs in our country and comparable countries, and the role of ICPs in enforcing safety in clinical settings. Another important limitation relates to the situation surrounding the COVID-19 pandemic due to which the work, communication, and cooperation, which was different from before the pandemic and during the various pandemic waves.

## Conclusion

ICP team members in a typical Slovenian general hospital assessed communication, cooperation, and safety in the ICP team in general as relatively good, but staff shortages severely limited the quality of implementation. The impact of ICP team collaboration and individual communication on ICP safety explained <50% of variance which means other determinants should be included in the study. The result also showed that the COVID-19 pandemic did not primarily affect ICP team members' fear of possible infection, as studies have shown in the first wave of the COVID-19 pandemic, but rather staff shortages leading to increased fear of errors and possible complaints and lawsuits from patients and relatives. Therefore, measures are needed for the additional employment of team members and the retention of current staff.

Because the findings showed that staff shortages can lead to increased fear of errors and potential patient and family complaints, steps must be taken to improve health-care financing, recruit more health-care professionals, and retain current staff.

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