Relationship between Interprofessional Communication and Health Care Team Collaboration

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Abstract

Background: One of the hospitals strategies to improve safety and enhance the quality of patient care, through the visible collaboration and strong communication among staff nurses and resident physicians working in ICU to maintaining a safe and effective therapeutic environment. **Aim:** to examine the relationship between interprofessional communication and health care team collaboration. **Methods:** A descriptive, correlational research design was conducted at Damanhour Chest hospital and Damanhour Fever hospital, at EL-Beheira Governate- Egypt. **Subjects:** It is composed of two groups: staff nurses (n=160) and resident physicians (n=30). **Tools**: 1) Interprofessional Communication Questionnaire (ICQ), and 2) Assessment of Interprofessional Team Collaboration Scale (AITCS). **Results:** There were highly statistically positive significant correlations between interprofessional communication dimensions (openness, accuracy, timeliness and understanding) and collaboration dimensions (partnership/ shared decision making, cooperation and coordination), where (P= 0.00). **Conclusion:** There were highly positive significant relationships was found between physicians and nurses in relation to interprofessional communication and team collaboration. **Recommendations:** developing strategy to improve nurse/physician communication and collaboration, the themes could be used to design learning activities for nursing and resident physicians, including discussions, simulations, and role playing.

Keywords: Interprofessional communication, Health care team collaboration, Nurses, Physicians.

Introduction

In the last decade, healthcare delivery systems have undergone a massive transformation where medicine is no longer physician-centric or disease-centered. Healthcare services have shifted toward a patient focus and place an emphasis on quality, satisfaction, value, and utilizing a holistic approach to promote overall wellness. Gilbert 2013.In critical care units, the health-care team has complicated dynamic, demanding, and time-pressured features that necessitate a team approach for providing treatment, enhancing efficient wider interprofessional team communication and collaboration (**Ghandour et al., 2019; Rose, 2011**). Interprofessional communication is defined by **Hailu et al.,** **(2016)** as: "a professional interaction, working together, sharing decision-making around health issues, formulating a collaborative patient care plan in which the actual team's performance is measured, as it is more than just the exchanging of information in which common understanding across health care team occurs".

According to **Shortell, (1991) Interprofessional communication encompasses four domains,** namely: (1) *openness*, which is measured within and between groups of nurses and physicians, who are able to say what they mean when speaking with each other without fear of repercussions or misunderstanding. (2) *accuracy*, which is measured within and between groups of nurses and physicians, refers to the degree to which nurses and physicians believe in the accuracy of

the information conveyed to them by the other party; (3) *timeliness*, which measure the degree to which patient care information is related promptly to the people who need to be informed; and lastly, (4) *understanding*, which is measured within and between groups of nurses and physicians, and involves the extent to which nurses and physicians believe communication on the unit is comprehensive and effective (**Hoonakker et al., 2013**).

Health care team collaboration is defined as "multiple health workers from different professional backgrounds work together with patients, families, caregivers and communities to deliver the highest quality of care"(**Nur et al., 2016). Orchard et al., (2016) divided interprofessional collaboration into three dimensions, namely:** (1) *partnership/shared decision making*; measuring participatory collaborative and coordinated approach between a team of health professionals and a client to shared decision making around health and social issues, depending on negotiation, communication, openness, trust and respectful power balance; (2) *cooperation*; measuring contribution of the team, understanding and valuing the contributions of other team members; and finally, (3) *coordination*; occurring when two or more team members work.

Significance of the study:

Collaboration and communication among healthcare providers receive little or no attention since they frequently operate separately and may or may not share patient information, needs, or referrals, resulting in obstacles to patient outcomes, cooperation, coordination, and communication among professions (**ALhanafi et al., 2020**). So, the present study aims to examine the relationship between interprofessional communication and health care team collaboration. It is hoped that such study highlighted the importance of improving interprofessional communication and collaboration to enhance patient outcomes such as decreasing medication errors and infection rates, length of stay, to enhancing patient safety and quality of health care.

Aim of the study

This study aims to examine the relationship between interprofessional communication and health care team collaboration.

Research question:

What is the relationship between interprofessional communication and health care team collaboration at Damanhour Chest and Fever Hospital?

Material And Methods

Research Design:

A descriptive, correlational research design was used in this study.

Setting:

The study was carried out at the two largest intensive care units (ICU) affiliated to Ministry of Health and Population (total bed capacity = 40). The first ICU was located at Damanhour Chest Hospital and the second at Damanhour Fever Hospital.

Subjects:

Two groups of subjects were included in this study (N=190).

1- All available and assigned staff nurses in the previously selected intensive care units who were available at the time of data collection, with at least one year of experience (N=160).

2- All available resident physicians in the previously selected intensive care units who were available at the time of data collection, with at least one year of experience (N=30).

Tools of the study:

In order to collect the required data, the following two tools were used:

Tool (I): Interprofessional Communication:

This tool was divided into two parts

Part (1): **Demographic Characteristics Data Sheet**:

It was developed by the researcher, and was included questions about: gender, age, educational qualification, working unit, position, years of working experience and unit experience.

Part (2): Interprofessional Communication Questionnaire:

This scale was developed by **Shortell et al., (1991)** and updated by **Hoonakker et al., (2013)** to measure nurse physician communication. It was composed of 22 items, grouped into four scales, namely: (1) openness (8-item); (2) accuracy (6- item); (3) timeliness (4-item); (4) understanding (4- item). Responses was measured on a 5-point Likert scale ranging from (1) strongly disagrees to (5) strongly agree.

Tool (II): Assessment of Interprofessional Team Collaboration Scale (AITCS)

It was developed by **Orchard et al., (2012)** to measure the interprofessional collaboration among health care team members. It was consists of 37 items grouped into three subscales as followed: (1) partnership/shared decision making (19-item); (2) cooperation (11-item); and (3coordination (7-item). Responses was measured on 5-point Likert rating scale ranging from (1) "never" to (5) "always".

Pilot study

A pilot study was carried out on (10%) of total sample size; nurses (n=16) and physicians (n=3) that were not included in the study sample. The pilot study was done to ascertain the relevance of the tool, to test the wording of the questions, clarity and applicability of the tools; to estimate the average time needed to collect the necessary data and to identify the different obstacles and problems that might be encountered during data collection, so as to make necessary arrangement to deal with them. Based on findings of the pilot study, no modifications were done.

Data collection

Data collection for this study was conducted by the researcher through self-administered questionnaire. It was hand-delivered to the study subjects, after individualized interview with each study subject for about 5 minutes to explain the aim of the study and the needed instructions were given before the distribution of the questionnaire in their settings. The questionnaire was completed by them during their work shifts. It took about 15-30 minutes to fill out the two tools. The data was collected in a period of three months, starting from the first of October 2019 to the end of December 2019.

Statistical analysis:

Data collected from the studied sample was revised, coded, entered and statistical analysis were fulfilled using the Statistical Package for Social Sciences (SPSS) version 22. Significance of the results was measured, where highly significant at p-value < 0.01; statistically significant was considered at p-value < 0.05 and non-significant at p-value ≥ 0.0

Ethical considerations:

The research approval was obtained from the ethical committee at the Faculty of Nursing, Damanhour University prior to the start of the study. An informed written consent was obtained from the study subjects after explanation of the aim of the study. Privacy and right to refuse to participate or withdraw from the study was assured during the study. Confidentiality and anonymity regarding data collected was maintained.

Results

Demographic characteristics of study subjects, working in ICUs, at Damanhour Chest and Fever Hospitals.

Table (1) shows that staff nurses' age means ±SD was (27.37± 5.412); compared to resident physicians' age mean ±SD was (32.30± 5.670). The majority of staff nurses (83.8%) and above half of the resident physicians (53.3%) had from 20 to less than 30 years old. Concerning to working unit, above half of staff nurses (53.1%) were working in ICU at Chest hospital; whereas, resident physicians were equal in ICU Damanhour Chest and Fever units.

Regarding gender, less than three quarters of staff nurses (73.8%) were female; while 70% of resident physicians were male. According to educational qualification, less than half of staff nurses (46.2%) had Bachelor degree of Nursing Sciences; compared to 50% of resident physicians

had Bachelor degree of Medicine and surgery. Pertaining to years of working experience, staff nurses mean ±SD was (5.62±4.562); compared to resident physicians mean ±SD was (6.80±5.410). Nearly two thirds of staff nurses (65%) and above half of resident physicians (53.3%) had from 1 to 5years of working experience.

Concerning years of ICU experience, staff nurses mean ±SD was (3.07±2.953); whereas resident physicians was (3.97±3.449). The majority of staff nurses and resident physicians had from 1 to 5 years of ICU experience (86.9%, 86.7%), respectively. Regarding marital status, less than two thirds of staff nurses and resident physicians were single (64.4%, 63.3%), consecutively.

Table (1): Demographic characteristics of study subjects, working in ICUs, at Damanhour Chest and Fever Hospitals. (N= 190)

Demographic characteristics	Staff nurses (N= 160)		Resident physicians (N= 30)		Total (N= 190)	
	No.	%	No.	%	No.	%
Age						
20 -	134	83.8	16	53.3	150	78.9
30 -	17	10.6	10	33.3	27	14.2
40 -	93	5.6	4	13.4	13	6.9
Min-Max	20 – 49		26 – 48		20 – 49	
Mean ±SD	27.37± 5.412		32.30± 5.670		28.15± 5.729	
Working unit						
ICU Chest	85	53.1	15	50	100	52.6
ICU Fever	75	46.9	15	50	90	47.4
Gender						
Male	42	26.2	21	70.0	63	33.2
Female	118	73.8	9	30.0	127	66.8
Educational qualification						
Diploma of Secondary Technical Nursing School	7	4.4	N/A	N/A	7	3.9
Diploma of Technical Health Institute	69	43.2	N/A	N/A	69	36.3
Bachelor of Nursing Sciences/ Bachelor of Medical and Surgical Sciences	74	46.2	15	50.0	89	46.7
Post Graduate Degree	10	6.2	15	50.0	25	13.1
Years of working experience						
1-	104	65.0	16	53.3	120	63.2
5-	40	25.0	10	33.3	50	26.3
10 +	16	10.0	4	13.4	20	10.5
Min-Max	1 – 29		1 – 24		1- 29	
Mean ±SD	5.62±4.562		6.80±5.410		5.81±4.711	
Years of ICU experience						
1-	139	86.9	26	86.7	165	86.8
5-	13	8.1	1	3.3	14	7.4
10 +	8	5.0	3	10.0	11	5.8
Min-Max	1 – 16		1 – 15		1 – 16	
Mean ±SD	3.07±2.953		3.97±3.449		3.21±3.044	
Marital status						
Single	103	64.4	19	63.3	122	64.2
Married	57	35.6	11	36.7	68	35.8

χ2=Chi square test   *P value (significant) ≤ 0.05   **P value (highly significant) ≤ 0.01 High ≥ 66.6% - 100%   Moderate ≥ 33.3% < -66.6%   Low 0 < 33.3%

Table (2): Mean percent scores of staff nurses and resident physicians' interprofessional communication, working at Damanhour Chest and Fever Hospitals (N= 190).

Inter-professional communication Dimensions	Staff nurses (N= 160)				Resident Physicians (N= 30)				T	P
	Min.	Max.	Mean ± SD	Mean % Score	Min.	Max.	Mean ± SD	Mean % Score		
Openness.	9	37	26.03±7.091	65.08	15	36	31.07±3.704	77.68	3.792	0.000**
Accuracy.	10	27	18.50±4.325	61.67	13	24	17.93±2.559	59.77	0.694	0.488
Timeliness.	6	19	13.50±3.479	67.50	9	17	14.27±1.741	71.35	1.177	0.240
Understanding.	7	19	13.40±3.421	67.0	8	18	14.13±2.700	70.65	1.110	0.268
Total Inter-professional communication	34	98	71.43±17.001	64.94	45	87	77.40±7.793	70.36	1.885	0.061

High mean percent score: ≥ 66.6% -100%   Moderate mean percent score: ≥ 33.3% < 66.6% Low mean percent score: 0 < 33.3%   T=Independent samples t- test
*P value (significant) ≤ 0.05   **P value (highly- significant) ≤ 0.01

Table (3): Mean percent score of staff nurses and resident physicians' collaboration working at ICU Damanhour Chest and Fever Hospitals. (N=190).

Collaboration Dimensions	Staff nurses (N= 160)				Resident Physicians (N= 30)				T	P
	Min.	Max.	Mean ± SD	Mean % Score	Min.	Max.	Mean ± SD	Mean % Score		
Partnership/ Shared decision making.	22	87	60.99±16.867	64.20	44	85	73.50±8.569	77.37	3.960	0.000**
Cooperation.	15	53	35.66±8.999	64.84	25	50	41.97±5.732	76.31	3.694	0.000**
Coordination.	8	35	22.79±6.782	65.11	15	32	27.00±3.723	77.14	3.300	0.001**
Total Collaboration	50	170	119.45±31.306	64.57	84	166	142.47±16.216	77.01	3.923	0.000**

High mean percent score: ≥ 66.6% -100% Moderate mean percent score: ≥ 33.3% < 66.6% Low mean percent score: 0 < 33.3%   T=Independent samples t- test
*P value (significant) ≤ 0.05   **P value (highly- significant) ≤ 0.00

Table (4): Correlation matrix between staff nurses' and resident physicians' interprofessional communication and their collaboration, at Damanhour Chest and Fever Hospitals. (N= 190)

Interprofessional Communication / Collaboration		Interprofessional Communication dimensions					Collaboration dimensions			
		Openness	Accuracy	Timeliness	Understanding	Total Interprofessional Communication	Partnership	Cooperation	Coordination	Total Collaboration
Openness	R	1	0.722	0.799	0.794	0.943	0.826	0.752	0.779	0.830
	P (2-tailed)		0.000**	0.000**	0.000**	0.000**	0.000**	0.000**	0.000**	0.000**
Accuracy	R		1	0.752	0.725	0.871	0.659	0.623	0.627	0.670
	P (2-tailed)			0.000**	0.000**	0.000**	0.000**	0.000**	0.000**	0.000**
Timeliness	R			1	0.800	0.906	0.752	0.708	0.761	0.774
	P (2-tailed)				0.000**	0.000**	0.000**	0.000**	0.000**	0.000**
Understanding	R				1	0.898	0.749	0.655	0.700	0.744
	P (2-tailed)					0.000**	0.000**	0.000**	0.000**	0.000**
Total Interprofessional Communication	R					1	0.833	0.763	0.796	0.841
	P (2-tailed)						0.000**	0.000**	0.000**	0.000**
Partnership	R						1	0.875	0.864	0.978
	P (2-tailed)							0.000**	0.000**	0.000**
Cooperation.	R							1	0.858	0.945
	P (2-tailed)								0.000**	0.000**
Coordination.	R								1	0.929
	P (2-tailed)									0.000**
Total Collaboration	R									1
	P (2-tailed)									

r=Pearson Correlation   **P value at level $\leq$ 0.01 (highly significant)
1= perfect correlation   0.25 - 0.50 low,   0.50 - 0.75 moderate,   0.75 – 0.95 high

Table (5): Multivariate regression analysis of collaboration among staff nurses, working at Damanhour Chest and Fever Hospitals. (N= 160)

	Unstandardized Coefficients	Standardized Coefficients	T	`P-value
	B	B		
(Constant)	7.215		0.687	0.493
Age (years)	0.192	0.033	0.395	0.694
Years of working experience	0.232	0.034	0.436	0.664
Years of ICU experience	2.102	0.198	2.881	0.005**
Openness	1.859	0.421	5.271	0.000**
Accuracy	0.034	0.005	0.064	0.949
Timeliness	2.556	0.284	3.402	0.001**
Understanding	2.134	0.233	2.802	0.006**
ANOVA				
Model	df	F	p values	r^2
Regression	7	71.077	0.000**	0.765

a: Dependent Variable: Collaboration   b: predictors: (Constant) Age, Years of working experience, Years of ICU experience, Openness, Accuracy, Timeliness, and Understanding
**P value (highly significant) $\leq$ 0.01   df= degree of freedom   F= One Way Anova
T= Independent Samples t-test R^2= Coefficient of multiple determination.

Table (6): Multivariate regression analysis of collaboration among resident physicians, working at Damanhour Chest and Fever Hospitals. (N= 30)

	Unstandardized Coefficients	Standardized Coefficients	T	`P-value
	B	B		
(Constant)	31.633		0.766	0.452
Age (years)	0.006	0.002	0.004	0.997
Years of working experience	0.770	0.257	0.502	0.620
Years of ICU experience	0.756	0.161	0.660	0.516
Openness	3.543	0.809	3.748	0.001**
Accuracy	1.526	0.241	1.657	0.112
Timeliness	0.429	0.046	0.221	0.827
Understanding	2.143	0.357	1.607	0.122
ANOVA				
Model	Df	F	p values	R^2
Regression	7	5.068	0.002**	0.617

a: Dependent Variable: Collaboration
b: predictors: (Constant) Age, Years of working experience, Years of ICU experience, Openness, Accuracy, Timeliness, and Understanding
**P value (highly significant) ≤ 0.01
df= degree of freedom
F= One Way Anova   T= Independent Samples t-test R^2= Coefficient of multiple determination

Discussion

Healthcare professionals from different disciplines, work collaboratively to serve patients. This necessitate the need for effective interprofessional communication and   health care team collaboration to reduce duplication of effort, restrict clinical error, improve safety and enhance the quality of patient care. It is crucial within the clinical area of intensive care units. Because of the severity of cases and the quick and often unpredictable changes in patients' conditions. **(Frenk et al., 2018; Reeves et al., 2013)**

Nursing and medicine are inseparably intertwined in hospital care. Patient outcomes are contingent upon the physicians' skills in diagnosis and treatment, as well as upon nurses' continuous observations and their skills in communicating the right information to the right professional team. Reeves 2013Good hospital care depends on a system that promotes interprofessional communication and health care team collaboration especially in ICUs. (**Abd El Rahman et al., 2014)**. So the current study aimed to examine the relationship between interprofessional communication and health care team collaboration.

Regarding demographic characteristics of the present study subjects, who participated in this study was190 the total number of staff nurses and resident physicians from Damanhour Chest and Fever ICU, where 160 staff nurses and 30 resident physicians were available at the selected hospital during data collection. The majority of staff nurses and more three quarter of resident physicians were between 20 and less than 30 years old. Above half of staff nurses and half of resident physicians working at ICU Chest Hospital while nearly three quarters of

staff nurses and above two thirds of resident physicians were female.

Interprofessional Communication

The findings of the current study revealed that there are highly statistically significant differences between staff nurses and resident physicians concerning to openness dimension. However, no statistically significant differences were found between both subjects and total interprofessional communication and the other dimensions (accuracy, timeliness and understanding).This finding may be due to that it is easy to talk openly within group communication of the ICU, on the other hand There are needless delays in relaying information regarding patient care, may be related to uncorrected hand off between health care team. It is clear from this that when nurses talk with each other, there is no enough deal of understanding and getting needed information become more default.

These agreed with the results of **Gutierrez-Puertas et al., (2020); Brown and Crooke, (2016)** stated that one of the primary reasons for the poor nurse-physician communication gap is the knowledge deficit of nurses related to the specialty discipline. Additionally, **Tan et al., (2017)**, reported that a continuous flow of interruptions and multiple patient handoffs affect the ability of nurses and physicians to connect effectively, and establish a trusting and interprofessional communication. On the other hand, this result is contraindicated with **Sasakiet al., (2018)** who revealed that staff nurses and resident physicians have positive responses to total interprofessional communication

Additionally, resident physicians had higher mean percent score than staff nurses for total interprofessional communication .This may be related to the awareness of physicians to culture of autonomy and hierarchy, team training and treatment plans, and importance of interprofessional meetings. Moreover, staff nurses suffer more than resident physicians for their work overload variation, shortage and long working hours, which consequently, it is difficult to ask advice from nurses, to go back and check the accuracy of information that received from nurses. Moreover, the fast paced, interruptive environment of the ICU reduced opportunities for nurses to go back and check the accuracy of information which has received.

This is congruent with **Abd El Rahman et al., (2014)** and **Hailu et al., (2016)** who concluded that physicians had higher mean score than nurses in total interprofessional communication. Moreover **Sasakiet et al., (2018)** and **Amudha et al., (2018)** who revealed that staff nurses and resident physicians have high score in openness dimension and low score in accuracy dimension. Moreover, it is in line with **Wang et al., (2018)** who showed that communication between nurses and physicians in the intensive care unit include as open communication, clear information, that is easily understood and timely.

Additionally, **Dapremont, (2013)** whose findings stated that shortage of nurses had been adding stress to the working environment. Moreover, **Mohammed et al., (2018)** revealed that nurses are trained to relate information in narratives, whereas physicians are trained to provide the most concise, top level communication possible. The fact that nurses and physicians are trained to communicate so differently can be a source of ongoing friction. On the other hand, **Ellithy et al., (2016)** revealed that nurse had higher mean score than physicians for interprofessional communication. Moreover, **Müller et al., (2018)** who established that nurses themselves recommend improved nurse preparedness as a key target for improving the effectiveness of interprofessional communication.

Health Care Team Collaboration

The findings of the present study indicated that there were highly statistically significant differences between staff nurses and resident physicians regarding total collaboration and all its dimensions, additionally, got moderate mean percent scores for staff nurses, whereas for resident physicians, got high mean percent scores. This may be related to there is sufficient understanding of interaction between physician and nurse, and their aware about responsibility of team work.

This also indicates their positive attitude toward the necessity of team collaboration and can be attributed to the nature of ICU, in which nurses must coordinate care with various multidisciplinary caregivers, may faster greater teamwork and collaboration. Moreover, these findings related to the profession of medicine has emphasized expertise, autonomy, power, status and responsibility more than interdependence, deliberation, or dialogue, while, nurses were used to follow orders and not giving them. In addition may be due to many factors such as tradition, the subordination of nurses to physicians, socialization within health care facilities, sexism and stereotyping, and the apprenticeship model of nursing education are found to affect the attitudes of physicians and nurses alike. Traditionally, the predominately physician group gives the orders for patient care, and the predominately nursing group carried out the orders.

These agreed with **Koech et al., (2020)** who concluded that physicians perceived more collaboration than nurses. Moreover, this was supported by studies done by **Cameron, (2011)** and **Speakman et al., (2015)** who concluded that engaging and working within interprofessional collaboration teams improving healthcare team performance outcomes and reflected on patient-centered care. Moreover, **Benner et al., (2010)** and **WHO, (2010)** who stated that in order to deliver quality care, clinicians are required to use knowledge and skills from numerous disciplines during patients' management and inter-professional approach coordination.

Moreover, **Ajeigbe et al., (2013)** who demonstrated that during the emergency situations staff who used interdisciplinary teamwork, perceived effective communication and sharing decision making; they were also more engaged in the functioning of their unit; they have freedom to make decisions regarding patient care. And **Bridges, (2011)** described that working together between nursing and medicine, sharing in decision making around health and social issues, to formulate and carry out plans for patient care and solving patients' problems.

Additionally, **Braam et al., (2022)** stated that in hospitals, multiple interactions exist, which in general involve several physicians and nurses as well as different health professionals that not only require good communication but also effective coordination of the different actions undertaken and share of medical information, in order to avoid repetition, inconsistency, or incoherence in caring for patients. Sharing of medical information and nurses-physicians communication were the highest dimensions; followed by nurses-nurse assistant's communication dimension. According to **Benner et al., (2010)** healthcare provides are expected to coordinate interprofessional approach and apply knowledge and skills from other health professionals while managing patients in order to deliver quality care.

The current finding contradicted with **Rice et al., (2010)** who found that interprofessional hierarchies had considerable negative effects on communication and collaboration with healthcare providers on a general internal medicine unit as physicians stated they were used to having their orders carried out without discussion or negotiation. Moreover, **Johannessen and Steihaug (2014), Papathanassoglou et al., (2012)** and **Van der Heijden et al., (2010)** whose concluded that equal sharing of power gives the professionals' capacity and autonomy in critical decision-making that are necessary interprofessional collaboration. However, they stated that unequal distribution of power accompanied by discrimination poses a major challenge to health system and significantly affects inter-professional collaboration.

Moreover, **Nisbet et al., (2015)** concluded that an underlying tension remains between medical and other health professionals and until they are addressed it is unlikely that the professions will be willing to adopt a team identity. Additionally, **Barrow et al., (2015)** stated that when healthcare providers asked to describe the members of their team they named members of the same profession.

In additional **Collette et al., (2017)** study which clarified that physician's generally perceived greater collaboration than nurses. On the other hand, **El Sayed et al., (2011) and Mohamed (2017)** studies were inconsistent with

this study as they concluded that there was significant differences existed between staff nurses and resident physicians attitude toward collaboration and nurses expressed more positives attitudes toward collaboration than physicians.

The Correlation between interprofessional communication and health care team collaboration.

In the present study, there were highly statistically positive significant correlations between interprofessional communication and its dimensions and between collaboration and its dimensions. This reflects the physicians and nurses working in ICUs awareness and understanding of the necessity of working in communicating and collaborative teams, since ICUs are characterized by caring of critically ill patients, high mortality rate, which impact the nurses' work even with interprofessional communication and team collaboration; therefore, leading to their feelings of decrease energy, exhaustion and impersonal response toward patients. This reflects staff nurses and resident physicians are skillful in their work and have effective communication that help them in decision making and coordination through open communication, good deal of understanding and timeliness.

This result in the same line with **Van Dongen et al., (2016)** whose revealed that communication between medical professionals and nursing was hindered by organizational, individual, and social factors. The social factors included hierarchical conflicts and profession-specific language barriers. Moreover, **Keller et al., (2013)** concluded that professionals with good interprofessional communication tend to enhance the competence, and confident to respond to conflict arise. In agreement of these results **O'connor et al., (2016)**, stated that an important determinant for success in collaborative practice among healthcare practitioners is effective communication, however, lack of understanding and open communication can lead to transfer of patient-related information inadequately. Moreover **Martin et al., (2010)**, found that mal-functional physician-nurse communication in health care facilities has been associated with higher

potential risks for increased clinical errors in health care.

Additionally, **Busari et al., (2017)**, found that healthcare professionals' need to quicken utilization of interprofessional collaboration and enhance communication in order to cope with the complex healthcare needs of a higher number of chronically ill patients. Additionally, **Lanham et al., (2016)**, stated that cooperation and trust could be enhanced through; shared holistic view inclusion, sufficient time for collaboration, better understanding of other professionals' skills and proper understanding of organizational structure.

Predictors of interprofessional communication and health care team collaboration.

The current study showed that staff nurses and resident physicians, results of a covariance analysis using interprofessional communication dimensions as independent variables and healthcare team collaboration as the dependent variable. The study revealed that year of ICU experience, openness, timeliness and understanding were significant predictors affecting the level of nurses interprofessional communication. However, openness was the only significant predictors affecting the level of physicians' interprofessional communication.

These finding supported by **El Gazar et al., (2022)**, who stated that nursing has a rich tradition of placing value on the relational elements within health care. Moreover **Brandt et al., (2015)** concluded that the inability of health care providers to work together were due to lack of proper communication and collaborative practices. Additionally, **McInnes et al., (2017)**, **McDonald et al., (2012) and Tsasis et al., (2012)** who observed that understanding and mutual trust, influence healthcare team collaboration in primary care.

This result contrasting **Robinson et al., (2010)** who found that nursing experience influence communication and behavior. Moreover the importance of openness of interprofessional communication was also observed by **Rawlinson et al. (2021) and verhovsek et al., (2010)** who indicated that

some clinical and administrative team members left participating in interprofessional care team as a result of inflexibility and discomfort with change, citing attitude as a major criterion worth considering hiring healthcare workers. Moreover **Jones and Jones (2011) and Abd El Rahman et al., (2020)** stated that clinical incidents in healthcare settings between healthcare professionals occurred as a result of no communication or break down of communication.

Conclusion and Recommendations

This study concluded that there were highly positive significant relationships between physicians and nurses in relation to interprofessional communication and health care team collaboration.

Based on the findings of the present study, it is recommended that:

Hospital administrators should:

1. Conduct training programs for physicians and nurses to enhance their communication skills.

3. Create a healthy, positive and competitive environment to strengthen their inter-professional communication skills

4. Develop policies and procedures to guideline and enhance teamwork in health care through a closed-loop communication protocol and ensure that information sent was received and interpreted correctly

5. Conduct regular meetings with staff nurses and physicians to promote effective interprofessional communication and collaboration.

6. Frequent analysis of nurses and physicians relation regularly to control any factors that could affect negatively on their collaboration

Health care team should:

1- Foster positive work environment through encouraging team building and team

work to improve effective communication and collaboration.

3- Improve communication between physicians and nurses in to regularly to control any factors that could affect negatively on their interprofessional collaboration.

4- Express their feelings to their first line nurse managers' that help to analyze positive and negative expressions that affect their collaboration.

5- Work in group cohesion, is an important way for positive work environment and motivation of nurses.

6- Participate on: problem-solving, critical thinking and situational judgment, as well as sharing information, and try to make good decision.

7- Recognize the opportunities and environmental issues, and best solutions to engage in the strategic plan process through interprofessional communication development.

8- Support and inspire work group cohesion and plan for the coordination through encouraging each other to improve interrelationships that can develop cooperation.

9. Attending regular training programs for development their communication skills.

Further studies:

1. The impact of communication and sharing information between health care team on patient safety.

2. The effect of the relationship between interprofessional communication and performance outcomes.

3. The effect of health care team on work engagement and competitive environment.

4. Assess factors improving and impeding healthcare team collaboration.

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