

# Nurse - physician collaboration and its relation to patients' safety climate in critical care units

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## Abstract:

**Background:** Effective collaboration between nurses and physicians is associated with patient safety and quality of care. **The aim:** assess nurse-physician collaboration and its relation to patients' safety climate in critical care units. **Design:** correlation research design was used. **Setting:** The study was conducted in critical care units at Benha University and Benha Teaching Hospitals. **Sample:** convenience sample consisted of 11 nurses and 11 physicians. **Tools:** two tools were used; **Tool I:** Collaborative Practice Scale: consists of two parts; (**part 1**): personal characteristics and (**part 2**): Collaborative Practice Scale to assess nurses and physicians collaboration behavior. **Tool II:** Patient safety climate questionnaire to assess nurses' and physician' perceptions regarding patient safety climate. **Results:** the nurses and physicians had a neutral level of collaborative behavior; the total level of nurses' collaborative behavior was higher (93.7%) than physicians' (92.9%). Also nurses and physicians had neutral perception regard patient safety climate. Nurses had higher percent regard patient safety climate (93.08%) than physicians (90.08 %). **Conclusion:** there was significant correlation between nurses-physician collaborative behavior and patient safety climate. **Recommendations:** conduct inservice program and workshop about team work and patient safety and development of an inter-professional collaborative environment to increase nurses' performance as well as improve patient safety climate.

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**Key Words:** Nurses, Physicians, Collaboration behavior, patients Safety, Hospital

## Introduction

Effective clinical practice must not focus only on technological system issues, but also on the human factor, good communication encourages collaboration to prevent medical and nursing errors. It is essential for health care organizations to assess health personnel for poor collaboration and offer programs to help foster team collaboration and provide opportunity for health care organizations to enhance their clinical outcome (*Deming, 2012*). Collaboration in health care is complementary roles

and cooperatively work, sharing responsibility among health care professionals for problem-solving and making decisions to formulate and carry out patient care plans (*Fagin, 2012*).

In intensive care unit, the collaboration between nurses and physicians is associated to patient safety. Intensive care unit is an area of hospital that provides aggressive therapy using technology and both invasive and noninvasive monitoring for critically ill and high-risk patients (*Bahadori et al., 2014*). An ICU nurse performs various tasks employing several tools and technologies with persons within a certain physical environment and under specific organizational conditions (*Aletras & Kallianidou, 2014 & Eldeeb, et al., 2016*). So the collaboration between physicians, nurses, and other health care professionals increases team members' awareness of each other's knowledge and skills leading to continued decision making improvement improve patient care and create satisfying work roles (*Baggs, 2011*). Nurse-physician collaborative behaviors is a process of interaction between nurses and physicians during the delivery of patient care through using open communication, working cooperatively, sharing responsibility for managing conflict, solving problem, and performing joint decision-making (*Boyle & Kochinda, 2010*).

The nurse manager creating a work environment in which nurse-physician collaboration is the expected norm. The nurse manager should clarify collaboration vision, practices as a role model for collaboration, and inspires others to achieve this goal. In addition, the nurse manager manipulates the environmental resources and facilitates .Therefore successful collaboration depending on; all team members should have clear idea about what to be achieved and team members should be working to meet the same goals or objectives for service users and patients. Each team member should have self confidence to share knowledge and information and mutual respect is given for each opinion to provide efficient, effective and safe patient care (*Weick, 2011*).

Many health care organizations are focused on the development of quality plan to enhance patient safety strategy. Understanding safety is important process because it helps in developing an effective system to reduce or prevent the adverse events and errors that occur in health care delivery. Safety is not the responsibility of a individual, device or department; it emerges from the interaction of components of a system (individuals, equipment's, departments). Therefore, if an environment is safe, the risk of accident is lower. Safe environment means monitoring the process of care to reduce defect in the process or avoid the way things should have been done. Thus, ensuring patient safety involves the

establishment of operational system and processes that increase the reliability of patient care. So each health care individual should have information about the other needs in order to practice effectively . Interprofessional collaboration between physicians and nurses is crucial for patient care. For safe patient care, neither profession can stand alone, making good collaboration skills is important (*Lin & Liang, ۲۰۱۳*).

Many factors can influence the ability of a team to practice effective co-operation, all of these occur in the changing context of health and social care practice include: financial as (team support, endorsing team work), Professional boundaries as (personal values, professional values, inter professional values), Professional socialization as (language, personal responses) finely good practice in team work as knowledge, methods of practice and ethics (*Christensen & Larson, ۲۰۱۳*). Therefore, health care professionals should continually modify their collaborative processes to make the patient safety climate more efficient and improve patient outcomes. Effective inter professional collaboration is important to enhance and support the patient safety climate (*Singer et al., ۲۰۰۹*).

Patient safety encompasses the processes and systems that protect patients from injury caused by medical and nursing mismanagement. Patient safety aims to prevent harm and negative outcomes of care. Ensuring patient safety requires operational processes and systems that will maximize the likelihood of preventing adverse medical events. The health care has embraced the various models and approaches to human error in order to analyze and evaluate risk and safety .The framework for evaluating patient safety within health care delivery process consisted of system components that work together to bring about improved practices and safer health care for patients (*Marchionni & Ritchie, ۲۰۱۱*). As part of safety culture, organization need to commit to patient safety by detecting errors and near misses by conducting active surveillance based on case finding, as well as retrospective chart review, routine self assessment to identify errors-prone of high risk processes, systems or setting that could jeopardize patient safety (*Bakhen et al., ۲۰۱۳*).

### ***Significant of the study:***

. Collaboration is acknowledged as a key concept regarding patient safety. In the outcome-oriented collaboration, the nurse and physician collaborated in critical care unit to improve the patients' benefit of the treatment. Since I.C.U ward nurses play a key role in interdisciplinary and disciplinary collaboration with regard to caring for all patients. Nurses constitute a large proportion of I.C.U personnel, their knowledge, skills, norms, values, beliefs and assumptions contribute to the unit's

overall safety climate. A successful patient safety climate is being considered as one of the major principles in health care organizations, because almost every process performed by health care professionals had potential risks and problems associated with its use in practice. Human errors are stated as the most common cause of patient safety; incidents and failures in team performance as contributory factors. Promoting a patient safety climate is considered to be the most important area for the improvement in hospitals (*Fagin, ۲۰۱۲*). So it is important to understand nurses and physicians collaboration and its effect on patient safety climate in order to improve collaboration between nurses and physicians.

### **Aim of the study:**

The present study aimed to assess nurse - physician collaboration and its relation to patients' safety climate at critical care units this can be achieved through:

۱. Assessing nurse- physician collaborative behavior.
۲. Assessing patient safety climate as perceived by nurses and physicians.
۳. Exploring the relation between nurse - physician collaboration behavior and patients' safety climate.

### **Research question:**

What the relation between nurse - physician collaboration behavior and patients' safety climate?

### **Subjects and Methods**

#### **Research Design:**

Correlation research design was utilized to conduct this study.

#### **Setting:**

The study was conducted at Intensive Care Unit (ICU) and Critical Care Unit (CCU) in two hospitals; Benha University Hospital and Benha Teaching Hospital.

#### **Sample**

The subjects included in the present study consisted of two groups, namely nurses group and doctors group.

**Nurses group:** A convenience sample consisted of ۸۶ nurses who are working in the previous setting, ۴۰ of them were working at Benha University Hospital, and the other ۴۶ nurses working at Benha Teaching Hospital.

**Physicians group:** A convenience sample consisted of 78 physicians who are working in the previous setting, 40 of them were working at Benha University Hospital, and the other 38 physicians working at Benha Teaching Hospital.

## Tools

Data were collected by using the following instruments.

### Tool (I): The Collaborative Practice Scale:

This tool consists of two parts.

**Part (1):** Contain personal characteristics of study subjects such as (age, sex, job, qualification, years of experience, marital status and previous training).

**Part (2):** The Collaborative Practice Scale (CPS) developed by *Bankston, (2009)* to assess nurses and physicians collaboration behavior. The CPS has two scales, one for nurses contains 14 items and the other for the physicians contains 11 items.

**Scoring system:** The score of the response answers were ranged from (3) always and (1) sometimes and (2) never. The range of total scores for nurses- physicians collaborative behavior expressed as follow; less than 30% for negative nurses- physicians collaborative behavior, from 30% to less than 50% for neutral nurses- physicians collaborative behavior and  $\geq 50\%$  for positive nurses- physicians collaborative behavior.

The reliability coefficients' alpha between questions for physicians' collaborative behavior with nurses was 0.86 and reliability coefficients' alpha between questions for nurses' collaborative behavior physicians with was 0.83.

### Tool (II): Patient Safety Climate Questionnaire:

Patient safety climate questionnaire developed by *Sexton et al., (2007)* to assess nurses and physicians perceptions regard patient safety climate.

**Scoring system:** The eight questions response categories ranged from (3) disagree, (2) neutral and (1) agree. The range of total scores for patient safety climate perception expressed as follow; less than 30% for negative perception, from 30% to less than 50% for neutral perception and  $\geq 50\%$  for positive perception. A higher patient safety climate score is reflective of higher perceived levels of patient safety climate. The reliability coefficients' alpha between questions was 0.96.

## Validity of the tools

The data collection tools were revised by a panel of five experts in the field of nursing administration. Modifications were done based on jury & experts comments such as modifying some words to give the right meaning for the phrase which did not understood clearly.

**Ethical consideration:**

The participated nurses and physicians were instructed by the researchers about aim and benefits of the study and verbal agreement was taken before data collection. The participants were assured that their participation was totally voluntary. Information obtained was treated with utmost confidentiality.

**Field work:**

Preparation of data collection tools was carried out over a period of three months from October 2014 to December 2014 after extensive literature of review. The tools were translated into Arabic format. Then the tools were revised for content validity by 5 juries who were experts in the related field, for clarity, relevance, comprehensiveness, and applicability. Official letter was taken from the Deans of Faculty of Nursing to the director of Benha University and Benha Teaching Hospitals to facilitate collection of data, and then oral consent was taken from nurses and physicians. 10% of study subject was conduct for pilot study (8 nurses) and (7 physicians) were included in pilot study to identify the clarity, time needed and applicability of the tool.

The data collection was taken in two months from January to February 2015. The data collected by researchers through distributing the questionnaire to nurses and physicians during her work hours, after meeting with unit managers and study subjects to explain the aim of the study to accept their participation as well as organizing and arranging the nurse's participation according to units needs and activities, the average number of collected questionnaire from both physicians and nurses were between 4-6 per day. The collaboration questionnaire took from 8-12 minutes and patient safety climate questionnaire took 6-10 minute to be completed

**Statistical design:**

A compatible personal computer (PC) was used to store and analyze data. The Statistical Package for Social Studies (SPSS), version 20 was used. Data were coded and summarized percentage distribution for qualitative variables. Comparison was performed using chi square test. Correlation among variables was done using Pearson correlation coefficient (Pearson's r, test) to measure of the strength and direction of the linear relationship between the study variables.

**Result**

**Table (١):** As seen from this table, the highest percent of nurses behaviors regarding collaborative behavior with physicians were (٧٣.٣% , ٦٨.٤% and ٦٨.٣%, ٦٨.٣%) related to physician tell point of view in their orders for the patients and find the physician are willing to take responsibility for solving problems with nurse in Benha University and Teaching Hospitals respectively. While the most behavior not done by nurses regard collaborative behavior with physician were (٨٠% and ٨٥.٤%) related to discuss with physicians in the area of medical specialization than nursing at Benha University and Teaching Hospitals respectively. There was no statistical significant difference between two hospitals.

**Table (٢):** As seen from this table, the highest percent of physicians behavior regarding collaborative behavior with nurses were (١٠٠%, ٨٢.٥% and ١٠٠, ٧١.٤%) related to physicians responsible for the discussion of different types of information with patients and discuss with the nurses similarities and differences in medical and nursing care in Benha University and Teaching Hospitals respectively. While the most behavior not done by physician regarding collaborative behavior with nurses was (٦٧.٥% and ٦٠.٧%) related to taking into account nurses opinion when developing a treatment plan for patients in Benha University and Teaching Hospitals respectively. There wasn't statistical significance difference between two hospitals.

**Figure (١):** It can be observed that nurses and physicians had a neutral level of collaborative behavior however; total level of nurses collaborative behavior was higher (٥٢.٧%) than physicians collaborative behavior (٥٢.٩%).

**Table (٣):** According to this table, the highest percent of physician (٧٥%, ٧٠% and ٧٨.٦%, ٦٧.٩%) agreed on personnel keep rules or guidelines and the culture in the clinical area makes it easy to learn from the errors of others in Benha University and Teaching Hospitals respectively. There wasn't statistical significance difference between two hospitals.

**Table (٤):** Shows agreement of nurses regard patient safety climate. According to this table, the highest percent of nurses (٨٠%, ٦٦.٧% and ٧٥.٦, ٦٣.٤ %) agreed on know the proper channels to direct questions regarding patient safety in the clinical area and personnel keep rules or guidelines in Benha University and Teaching Hospitals. There wasn't statistical significance difference between two hospitals.

**Figure (٢):** Distribution of nurses and physicians regarding patient safety climate. It can be observed that, nurses and physicians had neutral perception regard patient safety climate. Nurses had higher percent regard patient safety climate (٥٣.٥٨%) as compared to physicians (٥٠.٠٨ %).

**Table (٥):** Denoted the correlation between nurses-physician collaborative behavior and patient safety climate. It displayed significant correlation between nurses-physician collaborative behavior and patient safety climate as observed ( $r=.٥٠٣$ ,  $p=.٠٠٠$ ).

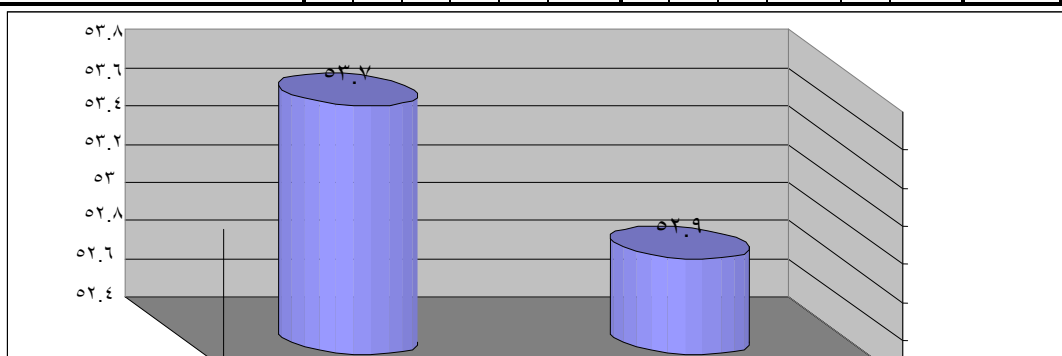
**Table (١): Nurses collaborative behavior with physicians in selected hospitals (N=٨٦)**

Items	Benha University Hospital No = ٤٥						Benha Teaching Hospital No= ٤١						X <sup>٢</sup>	P value
	Always		Usually		Never		Always		Usually		Never			
	No	%	No	%	No	%	No	%	No	%	No	%		
Ask physician about the extent expectations for the participation in health decision-making.	٢٨	٦٢.٢	١١	٢٤.٤	٦	١٣.٣	٢٧	٦٥.٩	١٣	٣١.٧	١	٢.٤	٣.٥٧٨	.١٦٧
Negotiate with the physician to determine the responsibility to discuss the different types of information with the patient.	٢٩	٦٤.٤	١١	٢٤.٤	٥	١١.٢	٢٣	٦٣.٤	١٣	٣١.٧	٢	٤.٩	١.٤٣٣	.٤٨٨
Explain to the physician the range of professional experience.	١١	٢٤.٤	٢٤	٥٣.٣	١٠	٢٢.٢	١٧	٤١.٥	٢٠	٤٨.٨	٤	٩.٨	٤.٠٤	.١٣٢
Discuss physician about engagement in the planning aspects of health care for patients.	١٤	٣١.١	٢٩	٦٤.٤	٢	٤.٤	١٧	٤١.٥	٢٣	٥٦.١	١	٢.٥	١.١٣٢	.٥٦٨
Ask colleague to help during planning and evaluation of care.	٢٢	٤٨.٩	١٨	٤٠	٥	١١.١	٢٠	٤٨.٨	١٧	٤١.٤	٤	٩.٨	.٠٤٩	.٩٧٦
Suggest to physician the method of care that will be useful for the patients	١٢	٢٦.٧	١٩	٤٢.٢	١٤	٣١.١	١٢	٢٩.٣	١٦	٣٩	١٣	٣١.٧	.١٠٨	.٩٤٧
Discuss with physicians in the area of medical specialization more than nursing.	٥	١١.١	٤	٨.٩	٣٦	٨٠	١	٢.٤	٥	١٢.٢	٣٥	٨٥.٤	٢.٦١	.٢٧١
Physician tell nurses view point in their orders for the patients.	٣٣	٧٣.٣	١٠	٢٢.٢	٢	٤.٤	٢٨	٦٨.٣	١٠	٢٤.٤	٣	٧.٣	.٤٢٥	.٨٠٩
Find my physician is willing to take responsibility for solving problems with me.	٣١	٦٨.٤	٧	١٥.٦	٧	١٥.٦	٢٨	٦٨.٣	٨	١٩.٥	٥	١٢.٢	.٣٦٧	.٨٣٢
Told physician with the aspects of nursing care for patients.	٢٨	٦٢.٢	١٥	٣٣.٣	٢	٤.٤	٢٣	٥٦.١	١٧	٤١.٥	١	٢.٤	.٧٦٤	.٦٨٢
Physician takes responsibility form nurses to solve problems.	٢٨	٦٢.٢	١٣	٢٨.٩	٤	٨.٩	٢٦	٦٣.٤	١١	٢٦.٨	٤	٩.٨	.٠٥٥	.٩٧٣
Ask physician about nurses participating in health decision-making.	٢٩	٦٤.٤	١٠	٢٢.٢	٦	١٣.٣	٢٥	٦١	٨	١٩.٥	٨	١٩.٥	٤.٧٩	.٠٩١
Explain the experience of professional nurses when there is many experiences.	٢٨	٦٢.٢	١٢	٢٦.٧	٥	١١.١	٢٨	٦٨.٣	١٢	٢٩.٣	١	٢.٤	٢.٤٨	.٢٨٩

Taking into account the opinion of the other nurses when developing the women's care plan.	٢٨	٦٢.٥	١٥	٣٣.٣	٢	٤.٤	٢٥	٦١	١٤	٣٤.١	٢	٤.٩	٠.١٨	.٩٩١
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**Table (٧): physicians collaborative behavior with nurses in selected hospitals (N=٦٨)**

Items	Benha University Hospital No = ٤٠						Benha Teaching Hospital No= ٢٨						X <sup>٢</sup>	P-value
	Always		Usually		Never		Always		Usually		Never			
	No	%	No	%	No	%	No	%	No	%	No	%		
Discuss with the nurses similarities and differences in medical and nursing care.	٣٣	٨٢.٥	٣	٧.٣	٤	١٠	٢٠	٧١.٤	٠	٠	٨	٢٨.٦	٥.٥٧٨	.٠٦١
Acknowledged that nurses have more than expected experience in health care aspects.	٢٨	٧٠	١٢	٣٠	٠	٠	١٩	٦٧.٩	٩	٣٢.١	٠	٠	٣٦	.٨٥١
Discuss with the nurses and ask them for help when evaluating and planning care.	٣١	٧٧.٥	٨	٢٠	١	٢.٥	٢٠	٧١.٤	٣	١٠.٧	٥	١٧.٩	٥.٧٠	.٠٦٩
Find nurses are ready to take responsibility to solve problems	٢٤	٦٠	١٢	٣٠	٤	١٠	١٧	٦٠.٧	٥	١٧.٩	٦	٢١.٤	٢.٤٣٦	.٢٩٦
Enhance the value of nursing care when talking with the patients.	٣١	٧٧.٥	٨	٢٠	١	٢.٥	٢٠	٧١.٤	٨	٢٨.٦	٠	٠	١.٢٩٥	.٥٢٣
Discuss with the nurses their expectations with regard to take the appropriate decision	١٩	٤٧.٥	١٩	٤٧.٥	٢	٥	١٤	٥٠	١٣	٤٦.٤	١	٣.٦	.١٠١	.٩٥١
Ask about the extent of the other nurses what is required in patients knowledge support system.	١٢	٣٠	٢٣	٥٧.٥	٥	١٢.٥	٧	٢٥	٢١	٧٥	٠	٠	٤.٤٢	.١٠٩
Responsible for the discussion of different types of information with patients.	٤٠	١٠٠	٠	٠	٠	٠	٢٨	١٠٠	٠	٠	٠	٠	-	-
Taking into account nurses opinion when developing a treatment plan the for patients.	٧	١٧.٥	٦	١٥	٢٧	٦٧.٥	٤	١٤.٣	٧	٢٥	١٧	٦٠.٧	١.٠٨	.٥٨٢
Agree with the nurses to get to the best ways of take patients care.	١٣	٣٢.٥	١٣	٣٢.٥	١٤	٣٥	٦	٢١.٤	١١	٣٩.٣	١١	٣٩.٣	١.٠٢	.٦٠١
Discuss areas of agreement and disagreement with the nurses to develop health goals.	١٦	٤٠	١٣	٣٢.٥	١١	٢٧.٥	١٥	٤٥.٦	٨	٢٨.٦	٥	١٧.٥	١.٣٩	.٤٩٧



**Figure (١): Distribution of nurses and physicians regard collaborative behavior (N=٨٦)**

**Table(٣):Agreement of physician regard patient safety climate in the selected hospitals (N=٨٦)**

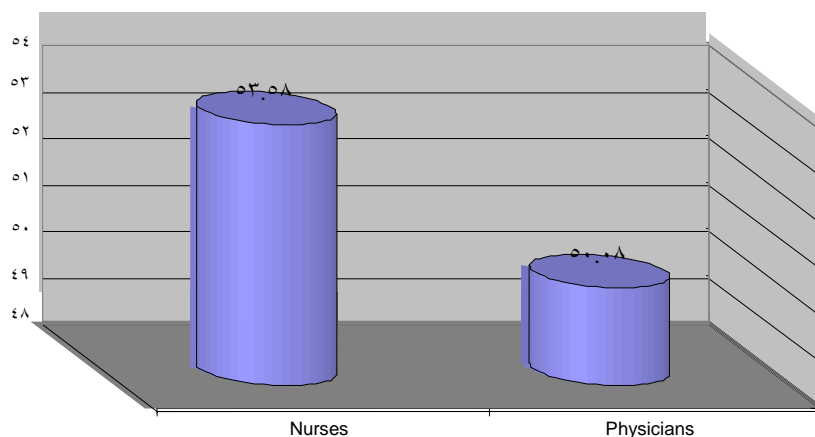
Items	Benha University Hospital No = ٤٠						Benha Teaching Hospital No= ٢٨						X <sup>٢</sup>	P- value
	Agree		Neutral		Disagree		Agree		Neutral		Disagree			
	N	%	N	%	N	%	N	%	N	%	N	%		
The culture in the clinical area makes it easy to learn from the errors of others.	٢٨	٧٠	٩	٢٢.٥	٣	٧.٥	١٩	٦٧.٩	٩	٣٢.١	٠	٠	٢.٦٩٠	.٢٦١
Medical errors are handled appropriately here.	١٦	٤٠	٢١	٥٢.٥	٣	٧.٥	١٣	٤٦.٤١	١٤	٥٠	١	٣.٦	.٦١٢	.٧٣٦
Suggestions about safety would be acted upon if I expressed them to management.	١٤	٥٣.٦	٢١	٥٢.٥	٥	١٢.٥	١٤	٥٠	١٤	٥٠	٠	٠	٤.٤٢	.١١٠
Encouraged the colleagues to report any patient safety concerns I may have.	٢١	٥٢.٥	١٩	٤٧.١	٠	٠	١٢	٤٢.٩	١٦	٥٧.١	٠	٠	.٦١٣	.٤٣٤
Know the proper channels to direct questions regarding patient safety in this clinical area.	١٤	٥٣.٦	١٣	٣٢.٥	١٣	٣٢.٥	٩	٣٢.١	٨	٢٦.٦	١١	٣٩.٣	.٣٣٧	.٨٤٥
Receive appropriate feedback about my performance	٢١	٥٢.٥	١١	٢٧.٥	٨	٢٠	١٧	٦٠.٧	١١	٣٩.٣	٠	٠	٦.٥٠	.٠٣٩*
Would feel safe being treated here as a patient	٢٢	٥٥	١٨	٤٥	٠	٠	١٣	٤٦.٤	١٥	٥٣.٦	٠	٠	.٠١٤	.٥٥٢
Personnel keep the rules or guidelines (e.g. hand washing, sterile field, etc.) that are established for the clinical area.	٣٠	٧٥	١٠	٢٥	٠	٠	٢٢	٧٨.٦	٦	٢١.٤	٠	٠	.١١٧	.٧٣٣

\*Statistical significant difference (P < .٠٥)

**Table (٤):Agreement of nurses regard patient safety climate in the selected hospitals(N=٨٦)**

Items	Benha University Hospital No = ٤٥	Benha Teaching Hospital No= ٤١		P- value
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	Agree		Neutral		Disagree		Agree		Neutral		Disagree		X'	
	No	%	No	%	No	%	No	%	No	%	No	%		
The culture in the clinical area makes it easy to learn from the errors of others.	16	30.0	23	51.1	6	13.2	20	48.8	17	40.4	4	9.8	1.062	.408
Medical errors are handled appropriately here.	11	24.4	31	68.9	3	6.7	9	22	29	70.7	3	7.3	.081	.960
Suggestions about safety would be acted upon if I expressed them to management.	14	31.1	21	47.7	10	22.2	8	19.0	28	68.3	0	0	1.126	.127
Encouraged the colleagues to report any patient safety concerns I may have.	19	42.2	17	37.8	9	20.0	19	46.3	16	39	6	14.6	.440	.080
Know the proper channels to direct questions regarding patient safety in this clinical area.	26	80	9	20	0	0	26	63.4	10	26.7	0	0	2.933	.098
Receive appropriate feedback about my performance.	14	31.1	19	42.2	12	26.7	17	41.0	21	51.2	3	7.3	0.716	.060
Would feel safe being treated here as a patient.	23	51.1	17	37.8	0	0	26	63.4	13	31.7	2	4.9	1.821	.402
Personnel keep the rules or guidelines (e.g. hand washing, sterile field, etc.) that are established for the clinical area.	30	66.7	10	22.2	0	0	31	70.7	10	24.4	0	0	.832	.477



**Figure (2): Distribution of nurses and physicians perception regard patient safety climate**

**Table (3): Correlation between nurses-physician collaborative behavior and patient safety climate**

<b>Nurses-physician collaborative behavior</b>	<b>Patient safety climate</b>	
	r	p- value
	.003	.000

## Discussion

Effective collaboration between nurses and physicians in hospital is associated with patient safety, quality of care, and provider satisfaction. Mutual nurse–physician collaboration is a common strategy to achieve desired quality outcomes in an effective and efficient manner in a complex array of health services. Nowadays, improved interprofessional collaboration is essential to facilitate information flow and the coordination and provision of healthcare within an increasing diversity of disciplines where one health professional can no longer meet all patient needs (**Sapountzi-Krepia, 2012**).

A successful patient safety climate is considered one of the major priorities for healthcare organizations because every process performed by healthcare professionals has potential risks and problems in practice, use of products, or within some procedures. Thus, there is immense interest in developing ways to improve the patient safety climate within healthcare organizations, especially through the reduction of errors that may cause serious consequences to patients and by building an environment that supports health care professionals to be more motivated, productive, and collaborate. This would help in providing high quality patient care (**Prakash, 2010**). Therefore, a study of nurse - physician collaboration in nursing and the work environment is crucial for assessing collaborative behavior between nurse-physician and its effect on patient safety climate.

The current study, revealed that fourteen five percent of physicians in Benha University aged between 30-40 year. While more than half of physicians in Teaching Hospital aged between 46-60 years. More than half of physicians are male in two Hospitals. The most of them were married. Half of physicians working as specialized and less than half of them had 0-10 experience years in two Hospitals. Also, the minority of them had received training program about collaboration and patient safety in two Hospitals.

The result of present study was supported **with SzQuazi, et al., (۲۰۱۲)** who conduct study standards for establishing and sustaining healthy work environments they stated that less than half of the physicians had less than ten years of experience.

As revealed from the current study, half of nurses aged between thirty to forty years in two hospitals, the most of them were married. Majority of nurses had diploma and more than half of them had sixteen to twenty years of experience in two hospitals. Also less than half of them had received training program about collaboration and patient safety in two hospitals.

A similar study was conducted by **Dimitriadou et al., (۲۰۰۸)** who conduct study about inter professional collaboration and collaboration among nursing staff members they reported that, the most of nurses were female and married with a mean age of forty years, The majority of them had work experience of eleven to twenty years.

Regard nurses- physicians collaborative behavior, the result of present study showed that, the highest percent of collaborative behavior reported by nurses were related to ask the colleagues about the expectations of participating in health decision-making and find the physician are willing to take responsibility for solving problems with nurses. In our researcher view due to collaboration is shared decision-making process between health care team for derived effective care. Open communication trust, mutual respect, and shared responsibilities are necessary for collaboration to solve problems.

In the same line **Pamela, (۲۰۱۶)** who study about enhancing nurse-physician communication and collaboration he reported that staff valued the importance of nurse-physician collaboration and demonstrates significant improvements in their practice as a result of collaboration. In contrary, **Espinosa et a.l, (۲۰۰۸)** who conduct study Barriers to intensive care nurses providing terminal care, showed that the limited involvement of nurses in decision-making processes and disagreement between physicians and other professionals are among the principal factors hindering effective care.

In relation to physicians-nurses collaborative behavior, the result of present study revealed that, the highest percent of collaborative behavior reported by physicians were related to physicians responsible for the discussion of different types of information with patients and discuss with the nurses similarities and differences in medical and nursing care. This is due to collaboration is essential to facilitate information flow and the coordination to meet patient needs.

The result of present study was congruent with **Vazirani et al.**, (۲۰۱۳) stated that, physicians reported that when nurses was part of the team, the team had better general communication. Also the result of present study agreed with **Kilpatrick et al.**, (۲۰۱۲) found that communication and decision-making improve quality of care when nurses was able to act within the full scope of the her role.

Regard to level of collaborative behavior, the result of present study revealed that both nurses and physicians had a neutral level of collaborative behavior however; total level of nurses' collaborative behavior was higher as compared to physicians. In researchers' view, the a neutral level of collaborative behavior result from barriers to good interprofessional relationships include time pressure, lack of clear job descriptions or understanding of each other's roles and tasks, different aims and priorities, different traditions and professional values, and poor organizational support.

The result of the present study disagreed with **Singer et al.**, (۲۰۰۸) conduct study that discrepant attitudes about teamwork among critical care nurses and physicians. Critical care medicine, he revealed that physicians tend to show a more negative attitude toward collaboration with nurses, and define collaboration as good when nurses observe physicians' orders. In contrast, nurses tend to have a more positive attitude toward inter-professional collaboration, and define collaboration as good when physicians respect their autonomy and professionalism. **EL-Sayed et al.**, (۲۰۱۱) reported that physicians had a positive perception of collaboration and physicians had a good collaborative relationship with nurses. **Weaver**,(۲۰۱۴) found that physicians rated the quality of their own collaboration "very high" with nurses. In contrast, nurses rated the quality of collaboration with physicians poorly. Nurses believed that a negative attitude toward communication as a significant obstacle to collaboration. Nurse perceives that their relationship is not mutually supportive and collaborative with physicians. **Fewster-Thuente**, (۲۰۱۱) stated that the conditions of interdisciplinary collaboration is poor.

The result of the present study contrary with **Caricati et al.**,(۲۰۱۳) reveal that physicians have higher scores than nurses, confirming that physicians are more likely than nurses to perceive that collaboration in place of critical care unit. **Joint Commission on Accreditation of Healthcare Organizations**,(۲۰۰۸) revealed that nurses experience lower satisfaction with nurse-physician collaboration than physicians. **Pamela**,(۲۰۱۶) found that nurse-physician collaboration behaviors were lower. There was a significant difference in perceptions of collaborative behaviors between nurses and physicians on general-medical surgical units.

Regard the agreement of physician regarding patient safety climate, the highest percent of physician agreed on personnel keep rules or guidelines and the culture in the clinical area makes it easy

to learn from the others errors. There wasn't statistical significance difference between two hospitals. This is due to patient safety climate aimed to avoid adverse outcomes and reduce possible harm to a patient from healthcare personnel. So healthcare personnel should be follow hospital rules and guideline to provide safe and effective care.

**Institute of Medicine, (۲۰۰۹)** in the same line reported that within a safe culture where people are not blamed for reporting adverse events, health workers would have the opportunity to learn from their mistakes, and institutions would be able to make improvements to prevent future human and system errors.

The result of the present study agreed with **Smits et al., (۲۰۰۸)** they recommended that creating a positive patient safety climate requires complex effort, including a range of actions in performance improvement, environmental safety, infection control, safe use of medicines, equipment safety, and safe clinical practice.

In relation to agreement of nurses regard patient safety climate. The result of present study showed that, the highest percent of nurses agreed on know the proper channels to direct questions regarding patient safety in the clinical area and personnel keep rules or guidelines. There wasn't statistical significance difference between two hospitals. This is due to the effectiveness of communication and collaboration is the basis of patient safety.

The result of the present study agreed with **Health Council of Canada, (۲۰۰۹)** proposed that when healthcare professionals communicate effectively and know how to work as a team, the quality of patient care increases. **Joint Commission on Accreditation of Health care Organizations,(۲۰۰۸)** revealed that nurses reported that, the physicians were open to discuss work-related concerns. Support from physician help to address conflicts appropriately. **Gurses & Xiao ,(۲۰۱۴)** stated that collaboration among health care providers is a major part of information flow in health care, and a major determinant of expected outcomes.

In relation to total percentage of nurses and physicians regard patient safety climate. The result of present study revealed that, nurses and physicians had neutral perception regard patient safety climate, nurses had higher percent regard patient safety climate as compared to physicians.

The findings of present study contradicting with **Abbas et al., (۲۰۰۸)** they revealed that nurses had poor perception regard patient safety. While **Bscphm et al.,(۲۰۰۸)** found that the overall studied nurses had positive perception regard patient safety.

Regard correlation between nurses-physician collaborative behavior and patient safety climate, the result of present study revealed significant correlation between nurses-physician collaborative behavior and patient safety climate. This is due to effective nurse-physician collaboration is important to enhance and support the patient safety climate and patient care.

The result of present study consistent with **Callahan et al., (2006)** they stated that health care personnel should continually modify their collaborative processes to make the patient safety climate more efficient for improving patient outcomes. Also **Watters & Moran, (2006)** reported positive outcome rising from nurse-physician collaboration. They suggested that improving patient safety climate is an important part of providing a high quality of patient care, which was also considered as one of the outcomes of inter-professional collaboration.

Furthermore, **Bridges et al., (2011)** proposed that educating health care professionals about concepts of working collaboratively would enhance the culture of patient safety. **Manojlovich et al., (2014)** stated that the understanding of health care workers on how to collaborate with each other in order to build an environment that supports a patient safety climate. **Hamlan, (2015)** he conduct study the relationship between inter-professional collaboration, job satisfaction, and patient safety climate for nurses in a tertiary-level acute care hospital he reported that with the presence of inter-professional collaboration within healthcare organizations and a good collaborative environment for health practitioners, nurses' job satisfaction could increase, in turn, could lead to a better patient safety climate.

As regard to the relation between nurses-physician collaboration behavior and their personal characteristics, the present study showed that, there was statistical significant relationship between nurses-physician collaboration behavior and their sex, martial status, and years of experience; the female nurses and physicians had higher collaborative behavior level than male. Also single nurses and physician had higher collaborative behavior level than married, nurses and physicians who had more than 10 years had higher collaborative behavior level than other.

This finding was supported by **Falana, Afolabi, Adebayo, and Ilesanmi, (2016)** who conduct study about " collaboration between doctors and nurses in a tertiary health facility in south west Nigeria: implication for effective healthcare delivery". Stated that female had good attitude to collaboration compared to male. Female respondents had a significantly higher mean attitudinal score compared to male

## **Conclusions:**

The results of this study can be summarized as follows, both nurses and physicians had a neutral level of collaborative behavior; the total level of nurses' collaborative behavior was higher than physicians'. Also nurses and physicians had neutral perception regard patient safety climate. Nurses had higher percent regard patient safety climate than physicians. There was significant correlation between nurses-physician collaborative behavior and patient safety climate.

### **Recommendations:**

In the light of the present study the following recommendations are suggested:

- Provide useful training strategy to enhance nurses and physicians work together and recognize the autonomy and competence of each profession before entering hospitals.
- Provide shared inservice programs and workshop about team work and patient safety to improve interprofessional collaboration and achieve high quality care.
- Develop a new culture for nurses and physicians about collaboration and patient safety which merges the unique strengths of each discipline with the mutual goal of quality patient care.
- Provide an inter-professional collaborative environment as a vital part of healthcare organization development to increase nurses' performance as well as improve patient safety climate.
- There is a need for further studies that explain the important factors that hindering inter professional collaboration and its negative outcomes.

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