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The Relationship between Nursing Team Work and Tuberculosis Patients' Outcomes

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Abstract

Background: Teamwork within health care is important for two main reasons. First, the quality of team work is associated with the quality and safety of care delivery systems. Despite being a preventable and curable disease, tuberculosis (TB) is still a major global health threat and the second leading cause of death due to an infectious agent worldwide. **Aim:** The study aimed to assess the relationship between nursing team work and tuberculosis patients' outcomes. **Design:** Descriptive correlational research design was utilized in this study. **Setting:** the current study was conducted at Badr University Hospital, which is affiliated to Helwan University, Egypt. **Subjects:** Convenience sample (n =80) nurses was used. **Tools of data collection:** (I) Teamwork perceptions questionnaire and (II) Tuberculosis knowledge assessment questionnaire were used for gathering data. **Results:** It showed that, 28.7% of the studied nurses had a high perception regarding teamwork. Additionally, 25% of the studied nurses had a good level of knowledge regarding TB. **Conclusion:** There was a highly statistically significant positive correlation among nurses' perception of teamwork and knowledge regarding tuberculosis. **Recommendations:** Implement regular team-based workshops and simulations to strengthen nursing personnel's ability to collaborate effectively in managing tuberculosis patients.

Keywords: Nursing Team Work, Patients' Outcomes and Tuberculosis.

Introduction

Health care organisations promote teamwork which is one of the fundamental components of nursing care characteristic that guarantees patient comfort and security. As nurses who operate in teams raise the organization's standards, team efficiency eventually affects not only nurses but the entire organisation Teamwork may be steadily encouraged and upgraded, that more bolsters the respectability of individual team constituents. Formal assessment of teamwork can produce the support of a well-understanding of the performance of teams, standards, and connections ***(Kohanová et al., 2024)***.

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Transmittal of healthcare duties will wait a preference in reinforcing the nation's health condition. Nursing staff are the way to solve this through good teamwork. Good teamwork is essential for healthcare staff to transfer dependable, adept, and exclusive patient care. Inappropriately, while healthcare surroundings have been supported to select more comprehensive teamwork approaches, skilled is a deficiency of news on how to do so. Teams are distinguished as cooperative groups of employees that enjoy completing talents, work towards common aims, and own the potential to obtain more advanced aims **(Azizan et al., 2023)**.

The team exists of staff that has various abilities and is related to work together, accompanying the guidance. Indicators of collaboration include; (1) Same aims, (2) Enthusiasm, (3) Clear functions and responsibilities, (4) Persuasive communication, (5) Conflict resolution, that is to say agreement in resolving conflicts, (6) Share power, and (7) Skills consumed by group members **(Arifin, 2024)**.

According to **PAHO (2024)**, the leading infectious disease-related cause of death worldwide is tuberculosis (TB). In order to address the TB epidemic, the World Health Organisation (WHO) proposed a comprehensive TB strategy to address the goals and accomplishments for 2030 and 2035 **(United Nations, 2022)**. About 10.6 million individuals were impacted by TB in 2021, and 1.6 million of them died from it, making it a significant global health concern. One of the leads of the end-TB plan is integrated, patient-focused care, which covers not only the first-contact medical care but also additional public and financial variables while concentrating on the unique requirements, wants, and principles of the patient **(WHO, 2024)**.

Acting as a nurse as a duty is varied, so it is no surprise that the teams of that nurse may be equally different. A nursing team is "two or more staff that agrees to specify care and managerial tasks for a group of patients." Maybe persuaded that this is a simple description by way of common people functions and accountabilities, nurses' request a team. Nurses are alongside the patient in this place principal function, frequently in the way that the advocate when the patient is incapable of fulfilling the selves function **(Creighton & Smart 2022)**.

As regard to **Centre for Disease Control (2024)**, 70% to 80% of TB cases involve the lungs, while it can also affect other organs. Typical signs of tuberculosis include fever, haemoptysis, night sweats, weight loss, decreased appetite, and prolonged coughing. The most prevalent sites of extrapulmonary tuberculosis were the bladder, cartilages and joints, brain and meninges, genitalia, kidneys, lymph nodes, and pleura.

The Washington State Department of Health (2024) testified that the lucrative state of TB patients is a concern due to drug resistance between one to eight cases of multidrug-resistant tuberculosis (MDR-TB) have been reported. Despite being avoidable, curable, and rectified, tuberculosis remains the most devastating infectious disease in the world. A significant improvement that goes hand in hand with TB services is the rise in TB examinations and statements regarding a decline in epidemic presentation skills, which improves the desire to strengthen the relationship with care and situation benefit **(Mathema, 2024)**.

Nursing Teamwork act mainly to advice procedure and application that can reinforce avoidance and develop TB care cascade effects for the impact of differing interferences on

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care cascade effects for active TB. Concerning TB interventions, instruction and advising, inducements, society-located attacks, and combined interventions guided numerous active TB care cascade effects. Nevertheless, cost-influence and local-background frameworks concede possibility should be thought-out when selecting specific blueprints on account of the extreme variety **(Marley et al., 2023)**.

Despite growing recognition of the importance of teamwork in tuberculosis (TB) care, significant gaps remain in the literature regarding how enhanced team-based approaches among nursing personnel directly influence patient outcomes. Most studies to date have focused on patient-centered interventions aimed at improving treatment adherence, reducing loss to follow-up, and increasing patient satisfaction, but have not systematically measured the specific impact of nursing teamwork on these outcomes. The implementation of TB-dedicated teams has been associated with improved treatment completion rates, reduced hospital stays, and decreased loss to follow-up, much of the available evidence is based on retrospective designs, limiting causal inferences and leaving questions about the mechanisms through which teamwork exerts its effects **(Di Gennaro et al., 2025)**.

Significance of the study

Research on teamwork in the nursing care of TB patients is restricted and consists of papers with a wide range of topics. In the healthcare industry, teamwork refers to the coordination of multiple individuals' efforts towards the shared objective of delivering safe, superior patient care. In nursing, teamwork is fundamental to providing high-quality care. A quarter of the National Health Service (NHS) in the United Kingdom workforce is made up of nurses, who provide the majority of hospital treatment. The remaining 25% is made up of support staff, such as healthcare assistants. Teamwork is thought to promote effectiveness, and healthcare needs to become more effective **(Baek et al., 2023)**.

In 2021, TB is expected to cause 10.6 million new cases, 1.6 million deaths, and 1.7 billion latent infections, making it a serious global health concern. Although it can afflict anybody, anywhere, 80% of all TB cases occur in low- and middle-income nations, where TB is the eighth and seventh leading causes of death, respectively. More than two-thirds of all new TB cases occurred in the World Health Organization's (WHO) regions of South-East Asia and Africa in 2020 (43% and 25%, respectively), with South-East Asia accounting for 46% of predicted deaths and Africa for 39% **(Villar-Hernández et al., 2023)**. Everywhere, tuberculosis (TB) is the superior cause of death from infectious disease. Completely this TB epidemic, the World Health Organisation (WHO) submitted a complete TB approach to solve the achievements and objectives for 2030 and 2035 **(PAHO, 2024)**.

Aim of the study

This study aimed to assess the relationship between nursing team work and tuberculosis patients' outcomes.

Research questions

1. What is the nurses' perception about team work?
2. What is the nurses' knowledge about tuberculosis patients' outcomes?

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3. What is the relationship between team work and tuberculosis patients' outcomes among nurses?

Subject and methods

Research design: Descriptive correlational research design was utilized to conduct this study.

Setting: The study was directed at Badr University Hospital affiliated to Helwan University and localized at the region of Badr City, Cairo, Egypt.

Sampling: A convenience sample of all available nursing personnel (80 nurses), working in the critical care unit, emergency room, and inpatient department, accepted to participate in this study and available at the time of data collection.

Tools for data collection:

Tool (I): Self-administration teamwork perceptions questionnaire: It consists of two main parts

- Part (I): Personal characteristics data; it used to collect data related to personnel characteristics of the study subjects included: (Age, current residence, gender, material status, nursing education level, years of experience, and work shift).
- Part (II): A structured self-administrative questionnaire; constructed and adapted by the researcher based on **Yilma (2020),** reviewed by experts, and pilot tested. It involved 35 items and 5 dimensions as the following (Team structure, leadership, situation monitoring, mutual support, and communication), every dimension included 7 items; it's measured the knowledge, awareness for the nursing personnel.

The scoring system:-

Teamwork perception questionnaire consisted of 5 dimensions with (35 items) and had a total score of (105 grade). 3 grades for agree response, 2 grades for neutral response and 1 grade for disagree response. The total grades of items summed up, converted into a percentage score, and classified in to three levels as the following:-

- The low level is less than 60%.
- The moderate is equal or more than 60 % to less than 75%.
- The high level is equal or more than 75%.

Tool (II): The Tuberculosis Knowledge Assessment Questionnaire (TKAQ): A structured self-administrative questionnaire constructed and adapted by the researcher built on literature review as ***Salad et al. (2014), and Kusuma et al. (2022),*** then validated by experts, and pilot tested. This questionnaire consisted of 30 items and 6 dimensions as the following; the first dimension aversion against treatment was included (7) items, the second dimension negative perception of TB treatment was included (3) items, the third dimension was general knowledge about TB infection, included (6) items, the fourth dimension knowledge about TB causes, was included (4) items, the fifth dimension knowledge about TB transmission was

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included (4) items, and the sixth dimension knowledge about TB prevention was included (6) items.

The scoring system:-

Tuberculosis Knowledge Assessment questionnaire involved 6 dimensions with (30 items) and had a total score of (0 grades). 3 grades were given for agree response, 2 grades were given for neutral response and 1 grade given for disagree response. The total grades of items summed up, converted into a percentage score, and classified in to three levels as the following:-

- The poor level is less than 60%.
- The Average is equal or more than 60 % to less than 75%.
- The good level is equal or more than 75%.

Validity and reliability:

Validity:

Validity of the tools was approved (face and content). The forms were interpreted into numbers and tested by a group of five experts specific to Nursing Administration from Faculties of Nursing of various four Universities, that is to say; three professors from Ain sham University; Damanhour University (one professor); and Cairo university (one professor).

Reliability:

Cronbach's Alpha was used to determine the internal reliability of the tool and the extent to which the questionnaire items were related to each other and the result was (0.997 & 0.989) for teamwork perception questionnaire and the tuberculosis knowledge assessment questionnaire, respectively.

Ethical and legal consideration:

The ethical consideration of the researcher included that, the research approval was obtained from the Ethical Committee of Faculty of Nursing Helwan University before starting the study, the researcher assured anonymity and confidentiality of the collected data, which was used by the researcher for the purpose scientific research. The subjects were informed that they were allowed to choose to participate or not in the study. Also, they have the right to withdraw from the study at any time, ethics, values, culture, and beliefs were respected, and study subjects were informed about research purpose.

Pilot study

The pilot study was completed activity on (10%) of the total sample content (8 nurses) to test relevance and clearness of forms and occasion wanted to complete it. No adjustments existed finished so participants in the pilot study remained contained in the study sample.

Field work:

The researcher changed the tools for data accumulation, join the Director of Badr Hospital affiliated to university to clarify the purpose and course of the study, together all essential knowledge about nursing personnel as (Code numbers, qualifications, departments, gender, age and years of experience working in the hospital). The researcher start to

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accumulate data from beginning of August 2023 completed at beginning of November 2023 (3 months), by utilizing the advanced tools accompanying the participants in the study location advised applicable opportunity outside interfering day-to-day work. The researcher scheduled the visits to the ward accompanying the preparation area as following; the researcher visited the hospital 3 opportunities per week eventually shift; each visit was categorized from 4-5 hours (from 9am to 2pm).

Firstly, the researcher began with the knowledge about teamwork perceptions to determine the information of nursing personnel. The time wanted to end this tool categorized between (15-20) minutes. **Secondly** the researcher used the self- administrative questionnaire to evaluate the nurses' knowledge about tuberculosis. The interval desired to complete this tool ranged between (15-25) minutes. Total period wanted to complete two questionnaires was (30-45) minutes.

Administrative design

An official written letter was addressed Approval was obtained through an issued letter by the Dean of Faculty of Nursing Helwan University and explaining the aim and objective of this study to the director of selected hospitals.

Statistical analysis

Data admission and exploration were completed using SPSS statistical package version 26. Categorical variables were articulated as number and percentage while incessant variables were conveyed as (mean ±SD). Chi-Square (x2) tested the association between row and column variable of qualitative data. ANOVA test associate the mean of typically disseminated quantitative variables. While T independent test associate the mean of typically disseminated quantitative variables in two groups. As well, Pearson correlation measured correlation between quantitative variables.

For all tests, a two-tailed p-value ≤ 0.05 was considered statistically significant, P-value ≤ 0.01 was considered highly statistically significant, while, p-value> 0.05 was considered not significant. Eta square (η2) measured the effect size (The referential framework for identifying the effect size for ANOVA-test value) **(Cognitive and Brain Science Unit, 2021*).***

Results

Table (1): Frequency distribution of personal characteristics among the studied nursing personnel (n=80)

Personal characteristics		No	%
Age (in years)	< 20	7	8.8
	20- < 30	52	**65.0**
	30- < 40	14	17.5
	40- < 50	6	7.5
	50- < 60	1	1.3
	$\bar{x}$ ± SD	**28.40 ± 7.05**	
Gender	Female	44	**55.0**

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	Male	36	45
Current residence	Rural	39	48.8
	Urban	41	**51.2**
Marital status	Single	49	**61.3**
	Married	30	37.5
	Divorced	1	1.3
Education	Diploma of nursing	35	**43.8**
	Technical institute	22	27.5
	Bachelor's degree	23	28.7
Job title	Staff nurse	67	**83.8**
	Head nurse	7	8.8
	Supervisor	6	7.5
Year of experience	1 < 5 years	44	**55.0**
	5 years < 10 years	30	37.5
	≥ 10 years	6	7.5
	$\bar{x}$ ± SD	**6.72 ± 5.11**	
Department	Critical Care Unit.	27	33.8
	Emergency room.	13	16.3
	Inpatient Department	40	**50.0**
Work shift	Full time	73	**91.3**
	Part time	7	8.8

Table (1) describes that (65%) of the age of the studied nursing personnel are ranged from 20- < 30 years old, with a mean age of 28.40 ± 7.05. Regarding place of residence, (51.2%) are from urban. Considering marital status, (61.3%) are single. Moreover, (43.8%) are holding a diploma of nursing certificate, with (83.8%) of nursing personnel being staff nurses. Moreover, (55% & 50%) of them are females had experience lasting from 1 year < 5 years with a total age of 6.72 ± 5.11 and working at inpatient departments, respectively. Finally, more than four-fifths (91.3%) are working full time.

Table (2): Comparison between mean score of nursing personnel perception regarding teamwork (n=80)

Items		$\bar{x}$ ± SD
Team Function	Low	7.67±1.45
	Moderate	14.04±0.20
	High	20.22±1.44
	Total	**13.19±5.3**
Leadership	Low	7.64±1.45
	Moderate	14.05±0.21
	High	20.30±1.18
	Total	**12.96±5.50**
Situation Monitoring	Low	7.40±1.19

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	Moderate	14.0±0.39
	High	20.43±1.08
	Total	**13.37±5.39**
Mutual Support	Low	7.50±1.21
	Moderate	13.96±0.35
	High	20.29±1.38
	Total	**12.87±5.34**
Communication	Low	7.53±1.04
	Moderate	14.0±0.28
	High	20.22±1.53
	Total	**13.20±5.35**
Total	Low	37.94±6.49
	Moderate	69.75±1.59
	High	100.96±7.28
	Total	**65.60±26.8**

*Significant p ≤ 0.05 **Highly significant p ≤ 0.01 F: ANOVA Test

Table (2) denotes that, the studied nursing personnel has a total mean score of perception regarding teamwork **(65.60±26.8)** (Total score=105).

Table (3): Comparison between mean score of nursing personnel knowledge regarding TB (n=80)

Items		$\bar{x}$ ± SD
Aversion against treatment	Poor	8.42±1.29
	Average	14.0±0.48
	Good	19.19±2.0
	Total	**13.18±4.94**
Negative Perception of TB treatment	Poor	3.33±0.60
	Average	6.0±0.0
	Good	8.81±0.54
	Total	**5.06±2.24**
General Knowledge about TB Infection	Poor	7.18±1.54
	Average	11.89±0.73
	Good	17.17±1.19
	Total	**11.17±4.46**
Knowledge about TB causes	Poor	4.80±1.27
	Average	8.0±0.00
	Good	10.85±1.26
	Total	**6.91±2.82**
Knowledge about TB Transmission	Poor	4.33±0.85
	Average	8.00±0.00
	Good	11.17±1.16
	Total	**7.11±3.13**
Knowledge about TB prevention	Poor	6.79±1.25
	Average	12.17±0.49
	Good	16.61±1.46

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	Total	**11.16±4.29**
Total	Poor	33.46±4.49
	Average	59.76±3.95
	Good	85.15±6.30
	Total	**54.60±21.58**

*Significant p ≤ 0.05 **Highly significant p ≤ 0.01 F: ANOVA Test

Table (3) denotes that, the studied nursing personnel perceive a total mean score of knowledge regarding TB (54.60±21.58) (Total score=90).

Table (4): Relation between personal characteristics and nursing personnel perception regarding teamwork (n=80)

Personal characteristics		**Perception regarding teamwork**	**Knowledge regarding TB**
		$\bar{x}$ ± SD	**$\bar{x}$ ± SD**
Age (in years)	< 20	38.57±9.4	32.29±4.42
	20- < 30	63.94±27.2	53.21±21.5
	30- < 40	70.57±14.4	57.93±11.3
	40- < 50	93.33±28.5	79.0±23.6
	50- < 60	105.0±0.0	90.0±0.0
	F & P	**4.8 (0.001**)**	**5.69 (0.000**)**
Gender	Male	64.28±26.7	53.94±21.8
	Female	66.68±27.1	55.14±21.5
	t & P	**0.396 (0.693)**	**0.24 (0.808)**
Current residence	Rural	61.77±28.3	52.41±23.0
	Urban	69.24±25.2	56.68±20.1
	t & P	**1.24 (0.216)**	**0.88 (0.379)**
Marital status	Single	58.43±23.4	48.73±18.9
	Married	76.83±28.8	63.77±22.8
	Divorced	80.0±0.0	67.0±0.0
	F & P	**4.6 (0.009**)**	**5.1 (0.008**)**
Education	Diploma	53.82±16.8	45.09±13.1
	Technical	64.26±31.4	53.94±24.5
	Bachelor's degree	78.91±21.6	64.70±19.5
	t & P	**5.56 (0.006**)**	**5.1 (0.008**)**
Job title	Staff nurse	60.33±25.3	49.99±19.8
	Head nurse	82.29±16.4	68.57±9.7
	Supervisor	105.0±0.0	89.83±0.405
	F & P	**11.5 (0.000**)**	**14.8 (0.000**)**
Year of experience	1 < 5 years	66.68±27.1	55.14±21.5

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	5 years < 10 years	56.13±21.3	46.77±16.0
	≥ 10 years	105.0±0.0	89.83±0.40
	F & P	**10.3 (0.000**)**	**13.0 (0.000**)**
Department	CCU	68.37±27.7	57.93±23.2
	ER	58.54±29.0	49.3±24.0
	Inpatient D	66.02±25.8	54.05±19.7
	F & P	**0.592 (0.556)**	**0.708 (0.496)**
Work shift	Full time	68.53±26.3	56.90±21.1
	Part time	35.0±0.0	30.57±1.13
	t & P	**3.35 (0.0001*)**	**3.2 (0.002**)**

*Significant p ≤ 0.05 **Highly significant p ≤ 0.01 F: ANOVA Test t Test: T Independent Test

Table (4) indicates that, there is a highly statistically significant relation between personal characteristics (Age, marital status, education, job title and year of experience) and nursing personnel perception regarding teamwork and nursing personnel knowledge regarding TB, separately.

Table (5): Correlation between nursing personnel perception of teamwork dimensions and knowledge regarding tuberculosis (n=80)

Teamwork	**Knowledge regarding tuberculosis**	
	R	**P**
Team Function	0.982	0.000**
Leadership	0.987	0.000**
Situation Monitoring	0.970	0.000**
Mutual Support	0.989	0.000**
Communication	0.983	0.000**

*Significant p ≤ 0.05 **Highly significant p ≤ 0.01

Table (5) clarifies that, there is a highly statistically significant positive correlation between nursing personnel perception of teamwork dimensions at P= 0.000.

Table (6): Correlational matrix between nursing personnel perception of teamwork and knowledge regarding tuberculosis (n=80)

Items	**Knowledge regarding tuberculosis**	
	R	P
Teamwork	0.986	0.000**

*Significant p ≤ 0.05 **Highly significant p ≤ 0.01 F: ANOVA Test

Table (6) clarifies that, there is a highly statistically significant positive correlation between nursing personnel perception of teamwork and knowledge regarding tuberculosis throughout the study at r= ranged from 0.903 to 0.986 & P= 0.000.

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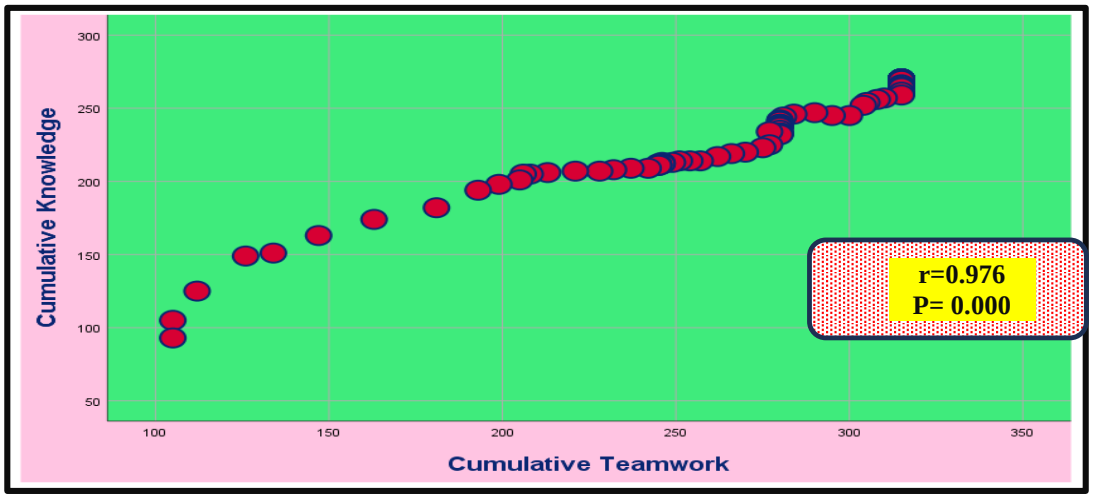

Cumulative: Sum of the pre and post in addition to follow-up scores

Figure (1): Scatter dot correlation between nursing personnel perception of teamwork and knowledge regarding tuberculosis (n=80)

Figure (1) illustrates that is a highly statistically significant positive correlation between nursing personnel perception of teamwork (cumulative) and knowledge regarding tuberculosis (cumulative) at r= 0.976 & P= 0.000.

Discussion

In the healthcare organization, it's essential to have teamwork, communication, and collaboration to provide quality patient care. Healthcare providers, including doctors, nurses, technicians, and other medical professionals, work together to ensure patients receive the best care possible. As a result, effective teamwork is vital in healthcare because it enables healthcare professionals to improve patient outcomes, reduce medical errors, and enhance the quality of patient care (**Gad et al., 2021)**.

In relation to the personal characteristics of the studied nursing personnel; the study results showed that less than two-thirds of the' ages are ranged from twenty to less than thirty years old, with a mean age of 28.40 ± 7.05. As well, more than half of them are females and more than half of them live in Urban. As researcher opinion, the studied nursing personnel are newly graduated, more male prefer to work in private hospital, and live near from the hospital place.

This result was in consistant with **Gad et al. (2021)** study entitled "Staff nurses' perception about teamwork and its effect on their job performance at Menoufia University Hospitals" who reported that two-thirds of the studied nurses' age were twenty to less than thirty-five years old, more than two-thirds of them were females but more than half of them from deferent rural area.

In the same line the study performed by **Kakemam et al. (2021)** entitled "Nurses' perception of teamwork and its relationship with the occurrence and reporting of adverse events: a questionnaire survey in teaching hospitals" and mentioned that around two-fifths of

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nurses' age were twenty-three to less than thirty years old, more than two-thirds of nurses were female live near the hospital in urban.

Similarly, the study performed by **Alghennai et al. (2023)** entitled "Development and validation of a questionnaire on the knowledge, attitude and practice (KAP) regarding tuberculosis among nurses working in tuberculosis centers in Libya" revealed that two-thirds of the studied sample age less than thirty years old, less than four-fifths of the studied nurses were female, more than half of them live in rural area.

As well, **Hassan et al. (2024)** finished study entitled "Evaluating the effect of team STEPPS on teamwork perceptions and patient safety culture among newly graduated nurses" who stated that two-thirds of the studied nurses were newly graduated female nurses live in Mansoura City deferent areas with mean age 21.92 ± 0.89.

In contrast the study done by **Kohanová et al. (2024)** entitled "Teamwork among nursing staff: a cross-sectional study" who reported that the most of the studied nurses were female live in deferent urban area with one-third of them were (20- < 35) years old.

Additionally, the results showed that more than three-fifth of the studied nursing personnel were single, less than half of had diploma of nursing degree, while most of nursing personnel attend a full time work, half of were working in inpatient departments with more than half of nursing personnel had from one to less than five and more than one-third had from five to less than ten years of experience with mean **6.72 ± 5.11**. As well, the majority of the studied nursing personnel were staff nurse.

As researcher opinion most of nursing personnel who had bachelor's degree or get enough experience prefer to work in privet hospital or travel for financial causes. As well, hospital need only limited number of nursing personnel had high job titles due to limited positions.

In the other hand, **Gad et al. (2021)** found that more than two-thirds of the studied nurses were married, more than half of nurses had associated nursing degree, while all of nurses attend a full time work, less than two-thirds of nurses were working in inpatient departments with years of experience about one-third for each group from less than five, five to less than ten, and equal or more than ten and most of nurses were staff nurse.

In the same line the study finished by **Hassan et al. (2024)** entitled "Evaluating the effect of team STEPPs on teamwork perceptions and patient safety culture among newly graduated nurses" who stated that all the studied nurses were working a full time as staff nurse, more than two-thirds of them were married, less than two-thirds of them had bachelor's degree with mean years of experience were 10.98 ± 6.41.

Similarly, the study performed by **Kakemam et al. (2021)** who mentioned that all the studied nurses were working a full time as most of them were staff nurse work in general word, less than two-thirds of nurses were married, the majority of nurses were had bachelor's degree with two-fifths of nurses had more than ten years of experience and about one-third had less than five years. In the same way, **Alghennai et al. (2023)** revealed that all the studied nurses had full time work in general ward, two-fifths of nurses had diploma of nursing, with two-thirds of nurses' years of experience were less than five years.

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As regard to percentage distribution of total level of nursing personnel perception regarding teamwork throughout the study illustrated that most of the studied nursing personnel had a lower mean score of perception regarding teamwork items (Team function, leadership, situation monitoring, mutual support, and communication).

As researcher opinion, nursing personnel need to get perception regarding the practices that reinforce nursing teamwork and how these affect the patients' care, by intend recognize the association among apparent teamwork and observed quality of care

This result was in agreed with the study performed by **Hassan et al. (2024)** who revealed a significant decrease in mean scores of Team STEPPS perceptions across first assessment. This detection highpoints the need of the Team STEPPS training regarding (Team function, leadership, situation monitoring, mutual support, and communication) in enhancing the perceptions of teamwork among these trainee nurses. Similarly, **Gad et al. (2021)** study demonstrated that the staff nurses' had a low mean score and total level of perception about teamwork at Menoufia University Hospitals in relation to (Team function, leadership, situation monitoring, mutual support, and communication).

Correspondingly, the study performed by **Kakemam et al. (2021)** who mentioned that the level and the mean score of the team work subitems (Team function, leadership, situation monitoring, mutual support, and communication) were at lowest level at pre-test accompanying with the occurrence and reporting of adverse events.

As regard to nursing personnel knowledge regarding tuberculosis the study demonstrated that the most of the studied nursing personnel gained an average mean score and level of knowledge regarding tuberculosis including (Aversion against treatment, negative perception of treatment, general knowledge about infection, causes, transmission, and prevention).

As researcher opinion, nurses consider at frontline tuberculosis healthcare team proficiency, behaviors, and activities about tuberculosis to optimizing responses for challenges and shortcomings and progress capability for development. As well, tuberculosis control be influenced by healthcare professional knowledge, practice, and multidisciplinary teamwork when handling with patients and augmenting the quality of care

Similarly, the result of the study achieved by **Ntinda** and **Kadhila (2022)** entitled "Knowledge and Practices of the Fourth Year Degree Nursing Students Regarding Tuberculosis Management" and displayed that the global perceived knowledge regarding TB management intervention program (General knowledge about TB Infection, causes, transmission, and prevention negative perception of TB treatment and aversion against treatment) was generally unsatisfactory at first assessment.

This result agreed with **Akande (2020)** study entitled "Knowledge and practices regarding tuberculosis infection control among nurses in Ibadan, south-west Nigeria: a cross-sectional study" and exposed that minor quantities of the nurses had respectable knowledge scores at regarding (Tuberculosis treatment, treatment, infection, causes, transmission, prevention, weak managerial support, poor funding, limited work space and inadequate staffing).

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Oppositely, **Alotaibi et al. (2019)** study entitled "Tuberculosis knowledge, attitude and practice among healthcare workers during the 2016 Hajj" performed and testified that overall mean knowledge score and total level; four-fifths of nurses had average or above mean knowledge score regarding (TB type, screening, diagnosis, symptoms, infection, and prevention).

The study results indicated that there was a highly statistically significant relation between personal characteristics (Age, marital status, education, job title and year of experience, department, and work shift) and nursing personnel perception regarding teamwork.

The results of the study reinforced by **Bragadóttir et al. (2019)** study entitled "The extent to which adequacy of staffing predicts nursing teamwork in hospitals" and found that there were statistically significant relationships wherever recognized for the subsequent variables: Hospital, unit, age, role, years of experience, and working hours on present-day unit and had adequacy of staffing and overall teamwork subscale while the correlation category to the global teamwork and the other four subscales were non-significant.

Similarity, the study completed by **Girgis (2021)**, who found that there were highly statistically significant relationships where identified among the studied nurses demographic characteristics (Age, gender, position, unit, shift time, years of experiences) and level of perception regarding teamwork.

On the other hand, **Kakemam et al. (2021)** study who mentioned that there were no statically significant relation between the studied group personal characteristics and team work subitems. Correspondingly, the study done by **Baek et al. (2023)** entitled "Nursing teamwork is necessary in encouraging patient-based care: a cross-sectional study" and presented that no statically significant relation among studied group demographic characteristics and perception regarding teamwork.

In relation to the study results indicated that there was a highly statistically significant relation between personal characteristics (Age, marital status, education, job title, work shift and year of experience, department, and work shift) and nursing personnel knowledge regarding TB.

This result in agreement with **Alotaibi et al. (2019)** who reported that there were a highly statistically significant relation between personal characteristics (Age, education, occupation and year of experience) and nursing personnel total level of knowledge about TB during.

Alike, **Helmy et al. (2023)** study entitled "Nurses' performance for patients with tuberculosis disease at chest dispensaries in El-Gharbia Governorate", and illustrated that there was a statistically significant relation among the nurse's level of knowledge regarding to TB and their' age, level of education, years of experience. Likewise, **Ndlebe et al. (2020)** who showed that there were statistically significant relationships between demographic characteristics (Age and education) and knowledge level.

Oppositely, **Akande (2020)** study revealed that the nurses' TB knowledge was not significantly related to all the socio-demographic factors considered. By the same token, **Amer**

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et al. (2023) study showed that there was no significant association between the sociodemographic variables and knowledge level.

Similarity, **Vigenschow et al. (2021)** study reported that age, gender, and work experience did not have any significant influence on knowledge about TB. While, statistically significant associations with higher knowledge levels were found regarding the level of education.

In relation to correlation between nursing personnel perception of teamwork dimensions and knowledge regarding tuberculosis; the study results indicated that there were a highly statistically significant positive correlation between the total and nursing personnel cumulative perception of teamwork and its dimensions (Team function, leadership, situation monitoring, mutual support and communication) and cumulative knowledge regarding tuberculosis and its similar to positive scatter dot correlation throughout the study.

This result in consistent with **Abebe et al. (2022) entitled** "Improving nurses' knowledge, practice, and self-efficacy regarding caring patients with tuberculosis", and stated that there was a highly statistically significant positive correlation between the studied nurses' perception regarding teamwork subscales and knowledge and barriers of tuberculosis management tuberculosis with to positive scatter dot correlation.

On the other hand, the results of the study finished by **Alotaibi et al. (2019)** who stated that there was a weak but statistically significant positive correlation between nurses tuberculosis knowledge, attitude and practice and teamwork comprehensive nurses management for tuberculosis control.

Conclusion

Based on the present study results more than one quarter of the studied nursing personnel had a high perception regarding teamwork and the one-quarter of the studied nursing personnel had a good level of knowledge regarding tuberculosis. As well, there were a highly statistically significant positive correlation between the total and nursing personnel cumulative perception of teamwork and its dimensions (Team function, leadership, situation monitoring, mutual support and communication) and cumulative knowledge regarding tuberculosis.

Recommended

Nursing personnel's level

- Implement regular team-based workshops and simulations to strengthen nursing personnel's ability to collaborate effectively in managing tuberculosis patients.
- Conduct training focused on improving interpersonal communication among nurses to minimize errors and ensure seamless patient care.

Organizational level

- Implement reward systems to acknowledge nursing teams that excel in delivering quality care to tuberculosis patients.
- Optimize nurse-to-patient ratios to enable effective teamwork and reduce burnout among nursing staff.

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Educational level

- Incorporate teamwork and collaboration-focused modules into nursing education programs with case studies related to tuberculosis care.
- Facilitate joint training sessions for nursing and other healthcare disciplines to simulate real-world team scenarios.

Research level

- Conduct longitudinal studies to assess the long-term impact of teamwork training on tuberculosis patient outcomes.
- Investigate how patients perceive nursing teamwork and its influence on their treatment adherence and satisfaction.

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