Effect of Polarity Thinking Training Program on Intra-Professional Collaboration among Nursing Staff

Nadia Mohamed Ali Saleh[1] & Hind Ismail Ali[2]
[1.] Assistant Professor of Nursing Administration, Faculty of Nursing, Sohag University, Egypt.
[2.] Lecturer of Nursing Administration, Faculty of Nursing, Sohag University, Egypt.

Abstract
The strain on nurses to make decisions about frequently challenging problems to solve has increased as a result of the swift changes within healthcare systems. The way people think has a big impact on how they work together to deliver high-quality healthcare. Polarity thinking can bring predictability and stability while also simplifying complexity without alienating the various groups. **Study aim to:** Assess the effect of polarity thinking training program on intra-professional collaboration among nursing staff. **Research design:** Quasi-experimental research design was used. **Setting:** The present study was conducted at Sohag University Hospital. **Subjects:** 76 members of nursing staff (Head nurses- Nurses) participated in the study. **Tools:** Three tools were used demographic data sheet, Polarity map application test, and Nurse-Nurse Collaboration behavior scale. **Results:** About (79%) of participants had low level of intra professional collaboration pre-program, while (61%) of them had moderate level post program. And polarity map level were good (71.05%) at post comparing with poor score (97.37%) at pre-program. **Conclusion:** There was a positive highly significant correlation between polarity thinking and intra-professional collaboration. **Recommendations:** Enhance the curriculum of nursing administration course in nursing faculties of Egyptian universities with learning activities about polarity thinking. Nurse Managers should display collaboration behaviors to construct an engaging climate, through using polarity thinking.

Keywords: Intra-professional Collaboration, Nursing staff, Polarity Thinking & Training program.

Introduction
Effective managers have honed their ability to explore into complicated challenges to spot opposites and capitalize on them as a result of a changing environment and a competitive landscape. Dilemmas, paradoxes, or polarities are the names for these interrelated opposites **(Frith, 2020)**. Polarities are about "both/and" thinking, rather than "either/or" thinking, There are identified values and anxieties for each polarity. Finding the "rightness" in the other person's point of view is made easier by using polarity thinking to grasp their perspective. Barry Johnson developed polarity thinking as a technique for leaders to use in managing the harmony of contrasts **(Brock et al., 2018).**

Health care providers must treat more patients with fewer staff and resources, use standardized evidence-based practices, implement new technologies, and maintain the personal touch that is so crucial to patient care as the healthcare industry evolves at an accelerating rate. And they are working to keep their organizations stable while welcoming the change required to advance. Their difficulties come in balancing "polarities"-two seemingly incompatible qualities that can complement one another when used in a thoughtful manner. **(Wick, 2017).**

Polarity thinking is about increasing the positive and avoiding the downside of each polarity as much as possible. Polarities are opposing values that eventually need one another to accomplish a greater goal. Polarities are essential to life and are necessary for maximal survival on all levels. For instance, breathing in and breathing out have opposing values, yet over time we need to perform both to fulfil the bigger goal of maintaining "life." We shall perish if we overdo one and neglect the other **(Levknecht, 2013).**

In healthcare organizations, there are anonymous numbers of polarities. Polarity Thinking is a powerful resource for meeting this challenge. The Polarity Thinking Framework and related tools are outlined in Barry Johnson`s book Polarity Management: Identifying and Managing Unsolvable Problems **(Polarity Partnership team, 2017).** Johnson created a tool called a polarity map in the 1970s to help in managing polarities. Through the mapping process, values and anxieties are discovered, and they are enhanced to incorporate measurements and action plans for successfully managing the polarity. To configure a polarity map, four crucial actions are taken. They are listed as follows: Decide on a central polarity, the names of the poles, the topics for each quadrant, and a greater goal and deeper fear. **(Tan-Tar, Beach & Roth, 2017)**

When polarities are poorly handled, organizations and individuals end up building the future they dread,

whereas when polarities are properly managed, they are able to generate a prosperous future. Effective managers are therefore those who can strike a balance between opposites like as consistency and change, task focus and staff focus, aggressiveness and caring, control and empowerment, confidence and humiliation, efficiency and innovation, and so on. **(Gab Allah & Nassar, 2018).** However, the major issues haunting healthcare today are combinations of problems and polarities. When healthcare professionals are not clear about how to differentiate between problems and polarities, they waste time, money and energy. **(Johnson, et al, 2013).**

Factors that affect nurse collaboration include clarity, professionalism, the ability to manage conflict, participation and shared handling, trust and regard, communication and cooperation, and communication and coordination **(Sibyl, et al, 2018).** The word collaboration comes from the Latin word collaborator, which means to cooperate. Collaboration among nursing professionals is referred to as intra professional contact. It does not happen on its own; rather, it is influenced by interpersonal and professional circumstances **(Merriam Webster's Online Dictionary, 2019)**. Intra professional nursing collaboration is professional process when nurses work together to solve a problem involving patient care or the healthcare system, they do it in a professional manner by forming a team and respectfully sharing their knowledge and resources **(Emich, 2018).**

Nurses communicate, coordinate care, solve problems, and share information on a regular basis as part of their job, for example, during handover or management changes **(Slusser et al., 2018).** Collaboration is a notion that nursing staff members need to understand thoroughly, as well as how to use it in a clinical situation. Medical error, unfavourable outcomes, and treatment delays have all been linked to inadequate communication and teamwork. According to studies, nurses frequently engage in bad interactions, withholding of support, a lack of coordination, tension, and intimidation **(Staggers & Troseth, 2020)**

Nurse leaders have vital roles to play in encouraging and supporting intra professional teamwork, which has a significant impact on nurses' welfare. It is necessary to cultivate social and cooperative abilities **(Abdelghany, et al., 2022).** A positive work environment that fosters open communication, constructive criticism, and teamwork improves job satisfaction and, as a result, the standard of patient care and patient safety. This in turn may draw in new nurses and keep existing ones in the field. **(Ylitörmänen, et al, 2023)**

Managing team conflict and disagreements over the relative merits of various ideas is one of the biggest issues facing leaders of healthcare teams. To be able to make wise judgments, health care teams need conflict as a necessary component of their process **(Kerps, 2016).** Conflicts among nurses may also be brought on by organizational restrictions, a leader's leadership style, poor interpersonal relationships, and violence amongst social equals who feel powerless **(Liao et al, 2015).** Working within a safety culture is crucial, especially in organizations that provide healthcare. Paradoxes can completely undermine safety efforts at the first slip-up if they are not handled constructively. On the other hand, when managers are equipped to handle polarities, a slip-up might present a chance to establish credibility and confidence. **(Classen et al., 2016).**

Significance of the study

The ability of nursing personnel to recognize and handle polarities helps them to conserve time and resources, foster trust, lessen resistance to change, and quicken the completion of their larger purpose. The efficacy of managers and consequent organizational performance could benefit if training and development specialists respond with timely training interventions. However, there isn't much research on polarity to be found.

Collaboration among nursing staff is essential for delivering high-quality care, enhancing staff well-being, creating a positive workplace culture, and enhancing nurses' job satisfaction **(Ambani et al., 2020).** This study's findings seek to have positive and helpful applications for managers who struggle to remain productive in increasingly complicated organizations. In order to determine how a polarity thinking training program will affect intra-professional cooperation among nursing staff, this study was carried out.

Aim of the study: To assess the effect of polarity thinking training program on intra professional collaboration among nursing staff.

Specific Objectives:
1. Developing a training program for polarity thinking.
2. Measure intra-professional collaboration levels among nursing staff before and after implementation of the program.
3. Delineate the effect of the program on level of polarity thinking and intra professional collaboration among nursing staff before and after implementation of the program.

Research Hypotheses:
H1. Implementation of polarity thinking training program effects intra-professional collaboration positively among nursing staff.

Subjects and Methods
Technical design
- **Research design:** Quasi-experimental research design was adopted to conduct this study. The investigators adopted Pretest-posttest research design to achieve the aim of the study.
- **Setting:** The present study was conducted at Sohag University Hospital. There were four medical departments (Oncology- Tropical – Neurology- Renal) and four surgical departments (Orthopedic- Urologic- Obstetric- General Surgery) which were included at this study.
- **Subjects:** Convenient sample of nursing staff at the selected inpatient departments. There was about (100) nursing staff at these departments, only 76 of them accepted to participate in the study during data collection period. There were (15) head nurse, (61) nurses who participated in the study
- **Tools of data collections:** Three tools were used in the present study.
  1- **Demographic data sheet** included data such as gender, age, marital status, experience years, and current job.
  2- **Polarity map application test** included asking each participant of nursing staff to set an example for polarity commonly faced by them and apply the steps of polarity mapping to manage this polarity. Participants were given a situation from their field work to assess their success in applying the polarity map to manage complex situation.
     Scoring: The total score was equal (20) and classified as: A score equal to or more than 85% was considered good in applying polarity thinking map. A score from 60% to less than 85% was considered fair in applying polarity thinking map. A score of less than 60% was considered poor in applying polarity thinking map.
  3- **Nurse-Nurse Collaboration Behavior Scale;** this tool was adapted from **Liao et al, (2015).** It includes 23 items used to determine the extent of collaborative behaviors that generally exist among nurses when providing patient care. There were three sub-items of Nurse- Nurse Collaboration behaviour scale as conflict management (8 items), communication& coordination(7 items); and professionalism(8 items). For each statement, the study participants indicated the frequency with which each behavior occurs.
     Scoring system: study participants was asked to respond to all items with five point-Likert scale as followed; Never = 1, rarely = 2, Sometimes= 3, Often=4, Always= 5.

Scoring: The total score was equal (115) and classified as: From 85% to100 % indicated that participants` collaboration behavior was high level; from 60% to84 % indicated that participants` collaboration behavior was moderate level, less than 60 % indicated that participants` collaboration behavior was low level.

Tool validity and reliability
Tools were tested for reliability using the Cronbach's Alpha Coefficient to measure the internal consistency of items of each tool. The overall Cronbach's Alpha of Polarity map application test was 0.87. The overall Cronbach's Alpha coefficient of Nurse-Nurse Collaboration Behavior scale was 0.929.Therefore, the two tools were reliable.

Five experts in the field of nursing administration evaluated the content validity: two professors at the Faculty of Nursing at Cairo University, one assistant professor at the Faculty of Nursing at South Valley University, and two assistant professors at the Faculty of Nursing at Sohag University. The experts believed that the tools were reliable.

Pilot study:
Prior to beginning the actual data collecting, a pilot study was conducted. The purpose of the pilot study was to gauge the questionnaire's clarity, relevance, and applicability as well as to determine how long it would take to complete. A sample of eight nursing staff members who were not included in the main study population was given the questionnaire. After the pilot study, no changes were made.

Administrative design:
Official permission was obtained from broad hospital manager and nursing director at Sohag University hospital before starting the program implementation.

Operational design:
Ethical consideration:
Initially, the ethics committee of the nursing faculty at Sohag University approved the research proposal. All participants were informed of their right to participate, decline, or withdraw at any time, and written consent was collected from each participant. Any information obtained was kept completely private.

Procedure:
Data collection procedure was conducted over seven months (from November 2022 to May 2023) at participants` work place. Upon receiving the formal approval from the ethical committee - Faculty of Nursing and official permission from the head of Sohag University Hospital committee, the investigators proceed with the study.

The study was accomplished through four phases:

Preparatory Phase: At this phase the investigators developed the training program through excessive

literature reviews. The investigators determined the program strategy time, number of sessions, teaching methods, media used (data show, white board and printed polarity map) and teaching methods (demonstration, group discussions, and brainstorming). The teaching place and program facilities were checked for appropriateness. This phase took one month.

Pretest Phase: The participants were divided into three groups (about 20-25 participants every time). The investigators explained the purpose and content of used tools to the selected sample to participate in the study. The investigators assessed intra professional collaboration and ask them to fill polarity thinking map (this map include brief direction about the technique of the mapping) immediately before starting of the training program. The investigators ascertained that all questions were understood.

Implementation Phase: The program was held three times, one for each group at the Sohag University Hospital training Hall after arrangement with the nursing director. Each group received three training sessions after work time (each session= 2 hours) with a break between each session. The implementation phase was started at December 2022 with the first group and ended at May 2023 with the last group. Study participants were required to select multiple

polarities faced by them in the work setting and develop a polarity map.

Posttest phase: The investigators reassessed Polarity map application test immediately after the program to assess the effect of the training program on their polarity thinking level. According to **Wang & Wilcox (2006)** measuring the effect of training on learners requires sufficient time for such opportunities to demonstrate their acquired skilled and would occur in their setting. So, the intra professional collaboration reassessed after six months after the last training session for each group differently to assure that use of polarity thinking map really affected their intra professional collaboration level.

Statistical design:

The Statistical Package for the Social Sciences (SPSS) program, version 24, was used to tabulate and analyze the participant data. Descriptive statistics, such as means, SDs, and frequency distribution, were used to analyze the data. The F value from an analysis of variance was calculated to compare more than two means. The Pearson's correlation coefficient (r) test was used to assess the correlation between the variables. All statistical studies' threshold for significance was set at a P value of less than 0.05.

Results:

Table (1): Percentage Distribution of the study participants` Demographic data (N=76).

| Demographic Items	Variable	Study sample N= 76	
		No.	%
Gender	Male	24	31.6
	Female	52	**68.4**
Age	18≥25yrs	32	42.1
	25≥45yrs	33	**43.4**
	45-60yrs	10	13.2
Department	Medical	31	40.8
	Surgical	45	**59.2**
Job position	Staff Nurse	61	**80.3**
	Head Nurse	15	19.7
Years of experience	Less than 5 year	26	34.2
	5≥10 years	32	**42.1**
	More than 10 years	18	23.7
Educational levels	Nursing Diploma	33	**43.4**
	Associate`s degree in Nursing	28	36.8
	Bachelor degree in Nursing	15	19.7
Marital status	Single	57	**75**
	Married	19	25
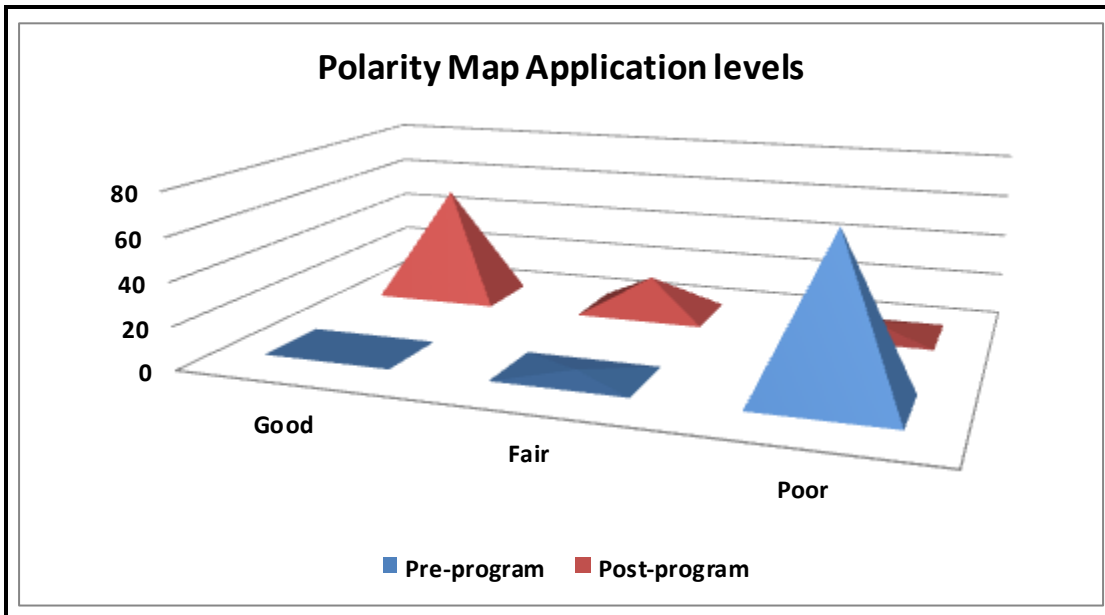
Figure (1): *Distribution of study participants` levels for Polarity Map Application pre-post the program: (N=76)*
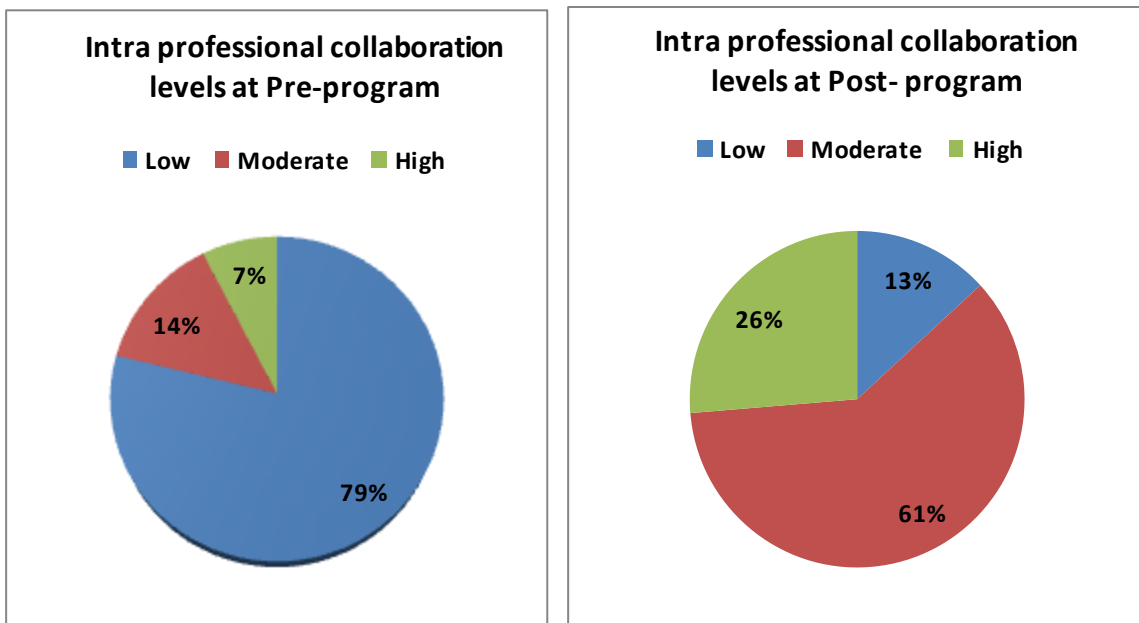

Figure (2): Distribution of study participants` for intra professional collaboration levels pre-post the program: (N=76)

Table (2): Distribution of study participants based on their Intra Professional Collaboration levels (N=76)

Items		Low No. (%)	Moderate No. (%)	High No. (%)
Gender	Male	2(8.33%)	7(29.17%)	**15(62.5%)**
	Female	5(9.62%)	27(51.92%)	20(38.46%)
Age	18yrs>25yrs	7(21.88)	11(34.38)	14(53.13%)
	25yrs>45yrs	2(6.06%)	15(45.45%)	16. (48.48)
	45yrs≥60yrs	0(0%)	**6(60%)**	4(40%)
Job position	Staff Nurse	13(21.31%)	34(55.74%)	14(22.95)
	Head Nurse	0(0%)	3(20%)	**12 (80%)**

Items		Low	Moderate	High
		No. (%)	No. (%)	No. (%)
Years of experience	Less than 5 year	16(41.60%)	7(29.92%)	3(11.54%)
	5≥10 years	2(6.25%)	17(53.13%)	13(40.63%)
	more than 10 years	1(5.56%)	5(27.78%)	**12(66.67%)**
Educational level	Nursing Diploma	13(29.39%)	9(27.27%)	11(33.33%)
	Associate`s degree in Nursing	8(28.57%)	12(42.86%)	8(28.57%)
	Bachelor degree in Nursing	2(13.33%)	5(33.33%)	**8(53.33%)**
Marital status	Single	9(15.79%)	29(50.88%)	19(33.33)
	Married	1(5.26%)	**10(52.63%)**	8(42.11)

Table (3): Comparison between study participants` Intra Professional Collaboration and Polarity Thinking pre-post program: (N=76)

Items	Pre-test	Post-test	T- value	P-value
	Mean ±SD	Mean ±SD		
Intra Professional Collaboration	78.49±10.55	97.19±14.29	8.869	**0.000***
Polarity Thinking	8.29±2.17	16.74±2.44	12.04	**0.000***

Table (4): Correlation between participants` personal data, Intra Professional Collaboration and polarity thinking (N=76).

Items	Intra professional collaboration		Polarity thinking	
	r	p	r	p
Gender	**-0.57**	**0.00****	-0.37	**0.05***
Age	**0.26**	**0.05***	0.25	**0.04***
Job position	0.21	0.06	0.17	0.10
Years of experience	**0.63**	**0.01****	0.34	**0.04***
Educational level	0.27	0.16	0.15	0.11
Marital status	-0.39	0.08	0.30	**0.05***

Table (5): Correlation between participants` polarity thinking score and Intra professional collaboration (N=76).

Item	Polarity Thinking	
	r	p
Intra professional collaboration	0.645	**0.003***

Table (1): Reveals that, about (68.4%) of the study participants were female, (43.4%) at age 25 yrs. >45 yrs., (80.3%) were staff nurses, (42.1%) had from one to ten years of experience. Diploma nurses were (43.4%), and (75%) of them were Single.

Figure (1): Reveals that, the levels of study participants at polarity map application test were good (71.05%) at post program comparing with poor level (97.37%) at pre-program.

Figure (2): Shows that, about (79%) of study participants had low level of intra professional collaboration at pre-program, while (61%) of them had moderate level of intra professional collaboration at post program

Table (2): Reveals that there was (n=15, 62.5%) of male participants, head nurses (n=12, 80%), who had more than ten years of experience (n=12, 66.67%) and who had bachelor degree (n= 8, 53.33%) had

high level of intra professional collaboration. Participants with age 45yrs≥60yrs (n= 6, 60%), and married participants (n= 10, 52.63%) had moderate level of intra professional collaboration.

Table (3): Reveals that there was a significant improvement of study participants` level of intra professional collaboration and polarity thinking level from before to after the training program.

Table (4): Shows that, there were significant correlations between gender, age, years of experience with both intra professional collaboration and polarity thinking. Also, there was significant correlation between marital status and polarity thinking.

Table (5): Reveals that, there was a strong positive highly significant correlation between polarity thinking and intra professional collaboration.

Discussion:

Reframing problems as polarities (or paradoxes) show that leaders and organizations can manage organizational tensions preferably. More recently, Polarity Thinking training sessions have been successfully introduced to optimize health care collaboration, which results in the sustainable achievement of desired outcomes **(Govaerts et al., 2019).**

The current study results revealed that more than half of the participants were female which may reflect the dominant gender of nursing profession in the Upper Egypt Society. These results were in agreement with **Darlow et al. (2015), Hellman et al. (2016), Sari et al. (2018), Haruta et al., (2019), Marcussen et al., (2019) & Mink et al., (2021)** they indicated that females were the major participants in their studies.

Majority of study participants were staff nurses. This result can be attributed to the setting of the study, where the number of staff nurses was more than head nurses. This is congruent with another result of this study where more than two fifth of participants had a nursing diploma and more than one third had associate` degree in nursing. On contrary to the current study, a study for **Liao, et al., (2015)** where about half of the participants had earned a bachelor's degree. This revealed that shortage of bachelor degree holders still hinders nursing at Upper Egypt.

This study results showed that about three quarter of study participants were single. This can be referred as improved awareness among females and their families related to the tradition of early marriage in Upper Egypt after excessive governmental effort. Also, this can be inferred to Young age of participants, where about two fifth of participants were less than 25 years old. On the other hand, this result is disagreed with a previous study at Lower Egypt **(Shalaby, et al., 2022)** where most of the participants were married. This disagreement can be resulted from different culture sample size or characteristics.

More than one third of study participants were between 25 and 45 years old and about two fifths were between 18 to 25 years old. This result can be due to increase in the number of fresh grade nurses in the last few years to cover the nursing shortage. This finding was agreed with an Egyptian study about staff nurses` perception of inter-professional collaboration **(Shalaby, et al., 2022),** where the majority of the participants` age was ranged between 24 and 50.

The current study revealed that about two fifths of participants had from 5 to ten years of experience. This result can be inferred from the young age of the participants. This result disagreed with a previous study about Intra professional Collaboration **(Abdelghany, et al. 2022** where only one quarter of

nurses had from six to ten years of experience. This disagreement can be resulted from difference in study sample or setting. The findings of previous study about attitudes and behavior towards Interprofessional Collaboration **(Ansa et al., 2020)** where about two fifths of participants had from five to ten years of experience.

As noticed from Figure (1), the majority of the participants were poor in applying a polarity map application test before receiving the training program while more than two third were good at the post program. This finding assured the effectiveness of the training progam in improving participants` polarity thinking level. This result was congruent with the findings of previous study where highly statistically significant difference between the mean score of nurse managers' knowledge and skills Pre, and post-training program about polarity management (**Mohamed, et al., 2021).**

The study results showed that a significant improvement of study participants` level of polarity thinking from before to after the training program. This result was compatible with **Elsayed, et al., (2023), Taie, (2014), Gab Allah & Nassar, (2018), Mohamed, et al., (2021)** where there was a highly statistical significant difference in between participants' knowledge about polarity management before and after program. This result supports the importance of the training program on improving nurses` polarity thinking level.

The study results indicated that there were about two third of participants had low level of intra professional collaboration before receiving the training program, while there were more than half of participants had moderate level and one quarter had high of intra professional collaboration at posttest of program. This result highlighted the role of polarity thinking skills in improving intra professional collaboration among nursing staff. Also, these outcomes are supported by **Ansa et al. (2020)** who reported that health team behaviour can be modified by training so; future health care professionals might be better prepared for their later work in intra professional teams.

This study finding was supported statistically as shown at table (3), where there was a significant improvement of study participants` level of intra professional collaboration after receiving the training program. In the literature, there are only a limited number of studies which linked between polarity thinking and collaboration behavior. **Polarity Partnership team, (2017)** mentioned that as "Creative Tensions are natural features of collaboration. They appear anytime people try to work together and the more complex and difficult the challenges, the more powerfully they show up.These

tensions (often called "polarities") are actually both needed in order for a group to be successful in its work.

The current study results revealed that there was a negative significant correlation between gender and intra professional collaboration. Male participants had high level of intra professional collaboration than females while the number of males was less than females. This result was incongruent with a previous Egyptian study where non-significant differences related to gender towards intra professional collaboration **(Abdelghany et al., 2022).** This may be due to the difference in sample size and difference in culture between Upper and Lower Egypt.

These findings also disagreed with the findings of **Lech et al. (2020),** who claimed that females had more positive attitudes towards intra professional collaboration. This result was attributed mainly to the individual attitude towards intra professional collaboration, previous clinical experience, personal interest, desire, or level of satisfaction.

The study results revealed that the study participants who worked as head nurses and had bachelor degree in nursing had high level intra professional collaboration than staff nurses. These findings can be inferred from the effect of the professional level on the collaboration level. This result was supported by the result of a previous study where high professional nurses (hold Bachelor degree or more) reported good collaborations comparing with nursing aides/orderlies **(Carradore et al., 2021).**

This result was linked to another variable as years of experience. There was about two third of participants who had more than 10 years of experience had high level of intra professional collaboration behaviour. This finding can be reasoned as collaboration is improved over years of work and contacts among workmates.

Beside that about two third of the participants had high level of intra professional collaboration behaviour were had more than ten years of experience. These findings supported by the fact that education and experience affect positively on collaborative behavior **(Karadaş, et al., 2022)** where high level of professionalism, advanced conflict resolution technique and effect communication style were developed by more education and extra years of education. As supported by the finding where there was strong positive highly significant correlation between polarity thinking and intra professional collaboration as shown table (5).

Conclusion:

The findings of this study concluded that, there was a significant improvement of study participants` level of intra professional collaboration from before to after six months of receiving the polarity thinking training program. The majority of the studied sample had a poor level of applying a polarity map before the training program while more than two third had a good level of applying a polarity map after receiving the training program.

Polarity thinking can enhance intra professional collaboration and therefor it can enhance developing and maintaining of productive working relationships between clinical professionals, patients, clients, families and communities to deliver optimal health outcomes.

Recommendations:

Based on the findings the following could be recommended:

1. Adding learning activities to help nursing students strengthen their polarity thinking skills should be added to the curriculum of the nursing administration course in Egyptian universities' nursing faculties.
2. Orientation programs for newly hired and actually presented nursing professionals should contain polarity thinking instruction.
3. Nurse Managers should exhibit collaborative behaviours by employing polarity thinking to resolve paradoxes to create a stimulating environment at work.
4. Further studies need to be conducted in different healthcare settings and among different health team categories to generalize the concept and usage of polarity thinking.

Limitation: The results may not be generalizable to reflect the whole population of healthcare professionals nationwide because the study was limited to the nursing field.

References

- **Abdelghany, R., Aly, M., Mamdouh, K., & Eltalawy, H. (2022):** Self-Assessment of Intra professional Collaboration: Attitude and Experience of Pediatric Physical Therapists in the Clinical Context. The Egyptian Journal of Hospital Medicine, Vol. (89), No. (1), Pp. 5335-5341. Available at: https://ejhm.journals.ekb.eg/article_263565.html
- **Ambani Z, Kutney A, & Lake ET (2020):** The nursing practice environment and nurse job outcomes: a path analysis of survey data. Journal of Clinical Nursing. Vol. (29), No. (5):Pp.2602–2614.
- **Ansa, B., Zechariah, S., Gates, A., Johnson, S., Heboyan, V., & De Leo, G. (2020):** Attitudes and Behavior towards Interprofessional Collaboration among Healthcare Professionals in a Large Academic Medical Center. Healthcare. (Basel,

Switzerland), Vol.(8) No. (3), Pp.323. Available at: https://doi.org/10.3390/healthcare8030323

- **Brock D, Abu-Rish E, Chiu CR, Hammer D, Wilson S, & Vorvick L,.(2018):** Intra professional education in team communication: working together to improve patient safety. Postgraduate Medical Journal;Vol. (89)No.(10)Pp.51-64.

- **Carradore, M., Michelini, E., Caretta, I., Carpi, S., Corradini, L., Ganapini, S., Lumetta, F., Paterlini, G., Pedroni, E., Russo, A., Sarli, L., & Artioli, G. (2021):** Intra professional collaboration between different health care professions in Emilia Romagna. Acta bio-medical: Atenei Parmensis, Vol.(92),No.(S2), Pp. 20-33. Available at: https://doi.org/10.23750/abm.v92iS2.11954

- **Classen, D., Resar, R., Griffin, Fm., Federico, R., Frankel T., Kimmel N., Whittington J., Frankel A., Seger A., & Brent, J. (2016):** Global trigger tool shows that adverse events in hospitals may be 10 times greater than previously measured. Health Affairs, Vol. (30), No. (4), Pp.1-9. Available at: https://pubmed.ncbi.nlm.nih.gov/21471476/

- **Darlow B, Coleman K, & McKinlay E. (2015):** The positive impact of intra professional education: a controlled trial to evaluate a programme for health professional students. BMC Medical Education, Vol.(15), No. (1): Pp.1-9.

- **Elsayed, M., Eid, M., & Kamel, F, (2023):** Effect of Polarities Management Educational Program on Head Nurses' Performance. Journal of Nursing Science Benha University, 4(2), 670-686. doi: 10.21608/jnsbu.2023.310298

- **Emich, C. (2018):** Conceptualizing collaboration in nursing. Nursing Forum, Vol. (53), No. (4), Pp.567-573. doi:10.1111/nuf.12287. Available at: https://onlinelibrary.wiley.com/doi/full/10.1111/nuf.12287

- **Frith, K. (2020):** Medication errors in the intensive care unit: literature review using the SEIPS model. AACN Advanced Critical Care; Vol. (24), No. (4):Pp.389-404.

- **Gab Allah, A., & Nassar, R., (2018):** Assessing and enhancing nurse managers' knowledge and skills in polarity management. International Journal of Nursing Research. Vol. (4), No. (3): Pp162-170.

- **Govaerts, M., van der Vleuten, C., & Holmboe, E. (2019):** Managing tensions in assessment: moving beyond either-or thinking. Medical education, Vol. (53), No. (1), Pp.64–75. Available at: https://doi.org/10.1111/medu.13656

- **Haruta J, Ozone S, & Goto R (2019):** Factors for self-assessment score of intra professional team collaboration in community hospitals in Japan. Family Medicine and Community Health, Vol. (7), No. (4):Pp.1-6.

- **Hellman T, Jensen I, & Bergström G. (2016):** Essential features influencing collaboration in team-based non-specific back pain rehabilitation: Findings from a mixed methods study. Journal of Intra professional Care, Vol. (30), No. (3): Pp.309-315.

- **Johnson B, DePol L. & Jacobs J. (2013):** Polarity Partnerships. Available from: http://www.polaritypartnerships.com

- **Karadaş A, Doğu Ö, & Kaynak S. (2022):** The Effect of Nurse-Nurse Collaboration Level on Job Satisfaction. Cyprus Journal Medical Science. Vol. (7):Pp.128-135

- **Kerps G (2016):** Communication and effective intra professional health care teams. International Archives Nursing & Health Care. Vol. (35), No. (2): Pp.30-45. 2:051. 10.23937/2469-5823/1510051

- **Lech, L., Husted, G., Almarsdottír, A., Andersen, T., Rossing, C., & Nørgaard, L. (2020):** Hospital and Community Pharmacists' Views of and Perspectives on the Establishment of an Intraprofessional Collaboration in the Transition of Care for Newly Discharged Patients. Innovations in pharmacy, Vol. (11), No. (3), 10.24926/iip.v11i3.2440. Available at: https://doi.org/10.24926/iip.v11i3.2440

- **Levknecht, L. (2013):** Using 'polarity thinking' to achieve sustainable positive outcomes. Elsevier, Posted on 8 January 2013. Accessed at 14 May 2023. Available at: https://www.elsevier.com/connect/using-polarity-thinking-to-achieve-sustainable-positive-outcomes

- **Liao C, Quin. Y, Hem Y., & Guo, Y., (2015):** The Nurse-Nurse Collaboration Behavior Scale: Development and psychometric testing, International Journal of Nursing Sciences, http://dx.doi.org/10.1016/j.ijnss.2015.10.005

- **Marcussen M, Nørgaard B, & Borgnakke K (2019):** Intra professional clinical training in mental health improves students' readiness for intra professional collaboration: a non-randomized intervention study. BMC Medical Education, Vo. (19) No. (1): Pp.1-10.

- **Merriam Webster's Online Dictionary, Attribute. (2019).** Retrieved March 23,2023, from https://www.merriamwebster.com/dictionary/attribute

- **Mink J, Mitzkat A, & Krug K (2021):** Impact of an intra-professional training ward on intra professional competencies–a quantitative longitudinal study. Journal of Intra professional Care, Vol. (35), No. (5): Pp.751-759.

- **Mohamed F., Abo Elmagd N. & Yussief, Y., (2021):** Effect of educational training program about polarity management on Nurse Managers' knowledge and Skills. Egyptian Journal of Health

Care, Vol. (12) No. (1), P.p892. Available at: https://ejhc.journals.ekb.eg/article_159849_a6b1726f03b6

▪ **Polarity Partnership team, (2017):** Collaboration Pattern: Leveraging Tensions. Retrieved at 21 June 2023. Available at https://www.polaritypartnerships.com/

▪ **Sari V, Hariyati R, & Hamid A (2018):** The association between stereotyping and intra professional collaborative practice. Enfermeria Clinica, Vol. 28: Pp. 134-138.

▪ **Shalaby, S., Shazly, M., & EL- Sayed, S. (2022):** Staff Nurses` Perception of Inter-Professional Collaboration versus Patient Safety Climate. Egyptian Journal of Health Care, Vol. (13), No. (4), Pp80-94. doi: 10.21608/ejhc.2022.258973

▪ **Sibyl, S., Bennadi, D., Kshetrimayum, N. & Reddy, (2018):** Readiness for interprofessional learning among dental undergraduate students: An institutional study. Journal of Indian Association of Public Health Dentistry. Vol. (16), No. (4) P.p, 328-332. Available at:https://journals.lww.com/aphd/pages/default.aspx/article.asp?issn=23195932;year=2018;volume=16;issue=4;spage=328;epage=332;aulast=Sibyl;t=6

▪ **Slusser M, Garcia LI, Reed CR, & McGinnis PQ (2018):** Foundations of inter professional collaborative practice in health care-e-book. New Jersey: Elsevier Health Sciences.

▪ **Staggers N., & Troseth M. (2020):** The role of usability and clinical application design in health information technology adoption. Nursing Informatics. In: Ball M., et al, Ed. Nursing Informatics: Where Caring and Technology Meet. 4th ed. New York: Springer Publishing.

▪ **Taie, E. (2014):** Designing and validating protocol for managing polarities in healthcare. Clinical Nursing Studies, Vol. (2), No. (3). Available at: https://www.sciedupress.com/journal/index.php/cns/article/viewFile/4144/2856

▪ **Tan-Tar A, Beach, M & Roth. (2017):** Unsolvable Problems and the Role of Polarity Thinking in Schools. Available at: http://www.learningforward-mo-msdc.org/wp-content/uploads-Introduction-to-Polarities-exanded .

▪ **Wang, G., & Wilcox, D. (2006):** Training evaluation: Knowing more than is practiced. Advances in Developing Human Resources, 8(4), 528-539

▪ **Wick, J. (2017):** Improving communication among health professionals, avoiding mistakes. Consult Pharm. Vol.(28), No.(8):Pp483- 486, 488. Available at: https://pubmed.ncbi.nlm.nih.gov/23906892/

▪ **Ylitörmänen, T., Kvist, T. & Turunen H. (2023):** Intraprofessional collaboration: A qualitative study of registered nurses' experiences, Collegian, Vol. (30), No. (1), Pp. 17-24, ISSN 1322-7696, (https://www.sciencedirect.com/science/article/pii/S1322769622000786)