Effect of Education Guidelines on Nurses' Performance toward Neonates Suffering from Meconium Aspiration Syndrome

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Abstract

Background: Meconium Aspiration Syndrome is defined as well as respiratory distress in neonates born through meconium stained amniotic fluid whose symptoms cannot be otherwise explained. The nurse role is assessing the signs of distress, keep normal temperature, prevent aspiration, and observe for complications. This study **aimed** to evaluate the effect of educational guidelines on nurses' performance toward neonates suffering from meconium aspiration syndrome.**Design:** A quasi- experimental design was used in the current study. **Settings:** The study was conducted in Neonatal Intensive Care Units at Specialized Pediatric Hospital at Benha City, Egypt.**Study subjects**: A convenient sample of (62) nurses and a purposive sample of (62) neonates suffering from meconium aspiration syndrome and need hospitalization. **Tools of data collection: Tool (1):** A structured interviewing questionnaire sheet consists of **Part (1):** Personal characteristics of the studied nurses, **Part (2):** Personal characteristics of the studied neonates and **Part (3):** Nurses' knowledge regarding meconium aspiration syndrome. **Tool (II):** An observational checklist to assess nurses' practices. **Results:** Majority of the studied nurses had good level of total knowledge in post-educational guidelines compared to pre-educational guidelines implementation. Also, the majority of the studied nurses had competent level of total practice in post educational guidelines. **Conclusion**: The educational guidelines were effective in improving nurses' knowledge and practice regarding care of neonates with meconium aspiration syndrome. There was a positive correlation between nurses' total level of knowledge and practices pre and post educational guidelines implementation. **Recommendation**: Conducted regular training programs and workshops for nurses regarding care of neonates with meconium aspiration syndrome.

Keywords: Educational guidelines, Nurses' performance, Neonates, Meconium aspiration syndrome.

Introduction

Meconium Aspiration Syndrome (MAS) is defined as respiratory distress in neonates born through Meconium-Stained Amniotic Fluid . However meconium aspiration syndrom can present with varying degrees of severity from mild respiratory distress to life-threatening respiratory failure. Coordination of care between the obstetric and neonatal team is important to reduce the incidence of MAS and to identify and provide urgent therapy in those who develop MAS to reduce morbidity and mortality**(Sharma et al., 2022).**

The occurrence of meconium aspiration syndrom for neonates is due to the aspiration of meconium-stained amniotic fluid. More ever, Meconium stained amniotic fluid is not an uncommon finding and is not always associated with meconium aspiration syndrom. Uterine stress due to hypoxia or infection can cause early fetal meconium passage. Which is darker

and thicker. It is formed through the accumulation of fetal cellular debris (skin, gastrointestinal, hair) and secretions. Aspiration of these materials causes airway obstruction, triggers inflammatory changes, and inactivates surfactant. Through these mechanisms, the neonate develops respiratory distress **(Carmona & Sayad 2022).**

The first clinical sign of MAS is the presence of MSAF at birth in a non-vigorous neonate, suggesting the typical pattern of asphyxia. The general findings may also include encephalopathy, heart failure, poor peripheral perfusion and a reduction of urine output. A neonate with MAS shows respiratory distress with heterogeneous severity associated with tachypnea, cyanosis, nasal flaring, respiratory retractions and a hyperexpanded and barrel-shaped thorax. **(Monfredini et al., 2021).** The best approach for managing meconium aspiration syndrom is prevention. Intrapartum care to reduce the incidence of it includes, intrapartum fetal heart monitoring – Continuous or periodic fetal heart rate monitoring has become a standard of care in the United States, particularly in pregnancies thought to be at higher risk for intrapartum fetal hypoxemia, evaluation and interventions are implemented in cases with abnormal tracings indicative of fetal stress to reduce the likelihood of perinatal asphyxia. Fetal heart rate monitoring identifies signs of hypoxemia and allows the caregivers to initiate prompt interventions in order to reduce the risk of it. Prevention of postterm delivery, preventing delivery after 41 weeks gestation reduces the incidence of meconium aspiration syndrome **(Phattraprayoon N., et al., 2022).**

Instructional guidelines for management of MSAF have been adopted. The most effective interventions for prevention of meconium aspiration syndrome include various methods to remove meconium from the pharynx, trachea and stomach during and immediately after delivery. Pharyngeal suctioning performed by the delivering attendant before the delivery of the shoulders has become almost universally accepted. The evidence for pharyngeal suctioning is based upon large body of data that shown dramatic decreases in meconium aspiration syndrom and neonatal morbidity and mortality after the institution of widespread pharyngeal suctioning for meconium stained amniotic fluid **(Madar et al., 2021).**

The goals of nursing care plann for neonates with Meconium aspiration syndrome are, maintain normal core temperature as evidenced by vital signs within normal limits and normal weight blood cells level, maintain fluid volume at a functional level as evidenced by individually adequate urinary output with normal specific gravity, stable vital signs, moist mucous membranes, good skin turgor and prompt capillary refill and resolution of edema, demonstrate increased perfusion as evidenced by warm and dry skin, strong peripheral pulses, normal vital signs, adequate urine output and absence of edema, identify the mother and demonstrate techniques to sustain lactation until breastfeeding is initiated**(Pillai et al., 2022).**

Significance of the study:

About, 10% of cases of respiratory failure in all neonates are due to Meconium aspiration syndrome. It is associated with significant morbidity and high mortality (up to 40%). The most common cause of Persistent pulmonary hypertension is meconium aspiration syndrom. At present, the management of neonates with MAS involves only supportive care such as oxygen therapy,

iv antibiotics for co-existing sepsis, assisted ventilation, inhaled nitric oxide, and if available, extracorporeal membrane oxygenation (ECMO) **(pillai et al.,2022).**The mortality rate of meconium stained neonates is considerably higher than that of non-stained neonates. So that, the currently study was aimed to evaluate the effect of educational guidelines on nurses' performance toward neonates suffering from meconium aspiration syndrome.

Aim of the study:

The study aimed to evaluate the effect of education guidelines on nurses' performance toward neonates suffering from meconium aspiration syndrome.

Research hypotheses:

1. The level of nurses' performance toward caring for neonates with MAS will be improved significantly after implementation of the education guidelines.
2. Outcomes of neonates with MAS will be improved after implementation of education guidelines.

Subjects and Method

Research design:

A quasi-experimental design was utilized for conducting this study.

Setting:

The study was conducted in Neonatal Intensive Care Units (NICUs) at Specialized Pediatric Hospital at Benha City,Egypt.

Subject:

1- A convenience sample of all available nurses working at the previously mentioned setting regardless of their characteristics.
2- A purposive sample of all available neonates suffering from MAS during the study period from the previously mentioned setting under the following inclusion criteria: Enrollment within 24 hours of birth at NICU. Neonates suffering from MAS and need hospitalization.

Tools of data collection-:

Data of the current study was collected through using the following two tools:

Tool (1): A structured interview questionnaire sheet: It was developed by the researcher and reviewed by the supervisors in the light of relevant studies and researches. It was written in a simple Arabic language and was consisted of three parts as the following:

Part (1): Personal characteristics of the studied nurses, which included, age, gender, educational level, position, years of experience in NICU and previous attendance of training courses about MAS.

Part (2): Characteristics of the studied neonates which included,gender, gestational age, current age, type of delivery , birth weight, current weight, ,vital Signs, oxygen source, modes of mechanical ventilator, duration for connection to mechanical ventilator, and complications occurred during connection to mechanical ventilator **.**

Part (3): Nurses' knowledge regarding care of neonates suffering from meconium aspiration syndrome: It was based on **(Singh ., et al., 2018).** It contained of (58) questions and classified into two main items-:

a) Nurses' knowledge regarding meconium aspiration syndrome (8 questions) : about definition of meconium, definition of MAS, composition of meconium, causes, risk factors, sign and symptoms, diagnostic tests and complication**.**

b)Nurses' knowledge regarding nursing care provided to neonates suffering from MAS, divided into (3) elements:

1)Nursing preparationbefore delivery.

2)Nursing care provided at delivery room

3) Nursing care at neonatal intensive care unit which included:-suctioning, endotracheal tube, oxygen therapy, continous positive airway

pressure (CPAP), mechanical ventilation, chest physiotherapy and infection control .

Scoring system for nurses' knowledge:

Nurses' knowledge was evaluated upon completion of the interview questionnaire where the studied nurses' knowledge was checked with a model key answer and accordingly, then the Correct answer was scored (1) grades, and incorrect answer was scored (0) grade.

The total scoring system was calculated as following:

•(75-100%)was considered good level of knowledge.

•60 less than 75% were considered average level of knowledge.

•Less than 60% was considered poor level of knowledge**.**

Tool (II): An observational checklist-:

It was based on **Kattwinkel, et al., (2011)** to assess nurses' practice regarding care of neonates suffering from meconium aspiration syndrome, such as: immediate neonatal recovery and immediate neonatal care, endotracheal intubation, oxygen therapy, chest physiotherapy, suctioning, care of neonate on nasal CPAP, care of neonates on mechanical ventilator, capillary blood gases sampling and infection control measures .

Scoring system for nurses' practice-:

The nurse response for each statement was ranged from (1) correctly done, and (0) for not done .

The total scoring system was calculated as the following:

(•85 %100) was considered competent level of practices.

• Less than 85% was considered incompetent of practices..

Validity and reliabilty of the study tools:

The study tools were revised by a panel of three experts in the field of Pediatric Nursing from Faculty of Nursing, Benha University to assess the content validity of the study tools. The experts reviewed the tools for clarity, relevance, comprehensives, simplicity, applicability and sequence of items. All their remarks were taken into consideration regarding the format, layout, rephrasing, consistency, accuracy and relevance of the study tools. Then the final form was used in data collection. The reliability was applied by researcher for testing the internal consistency of the tools by administrating the tool to the same subject under similar condition using cronbach's alpha coefficient test. Answers from repeated testing was compared(test-retest reliability), this turned to be (r=0.934) for Nurses' knowledge regarding care of neonates suffering from meconium aspiration syndrome and (r= 0.979) for nurses'practice regarding care of neonates suffering from meconium aspiration syndrome

Ethical considerations:

Written approval was obtained from the ethical committee of Faculty of Nursing Benha University. Ethical aspect was considered before starting the study the researcher explained the aim, natural and expected outcomes of the research for the nursies before their inclusion. They were informed that study is harmless. Also, maintain confidentiality was taken into consideration regarding data collection. Moreover, the studied nurses had the right to withdraw from the participation at any time. An oral consent was obtained from every nurse to participate in the study.

Pilot Study:

The pilot study was carried out during June 2021 (1 month) on 10% of the expected sample size of the studied nurses (6 nurses) from the previously mentioned setting to

evaluate the feasibility and applicability of the study tools, and estimate the proper time required for answering the data required. Nurses included in the pilot study were not excluded from the study as no radical modifications were done in the study tools.

Filed Work:

The actual field work started from the beginning of July 2021 to the end of December 2021, six months for data collection. The data was collected from the previously mentioned setting until reaching the size of sample. The researcher was available in the study setting three days weekly (Saturday, Monday and Wednesday) at morning and afternoon shifts from 9AM until to 4PM to collect the data using the previous tools.

Assessment Phase

A pre test carried out by using the study tools to assess thenurses' knowledge and practice regarding the neonates suffering from meconium aspiration syndrome .the average time needed for the complition of each tol was ranged between 20-30 minutes. The period of assessment phase (pre-test) took one month (July 2021).

Planning phase

Based on baseline data obtained from pre-test assessment and relevant of review of literature, the educational guidelines were developed by the researcher according to the actual needs assessment of the study subjects. According to the educational guidelines were designed by the researcher using simple Arabic language and pictures in order to facilitate nurses' understanding.

Statement of objectives:-

General objective:- The aim of educational guidelines was to improve nurses' knowledge and practice regarding care of neonates suffering from meconium aspiration syndrome based on full filling their needs of knowledge and practice .

Implementation phase:

The educational guidelines were implemented at period of (4) months from the beginning of August 2021till the end of November 2021.

General and specific objectives of implementation the educational guidelines were stated and implemented to improve nurses' knowledge and practice regarding care of neonates suffering from meconium aspiration syndrome based on full filling their needs of knowledge and practice.The implementation phase was achieved through eight sessions at period of three days /week .(3) sessions for the theoretical part and (5) sessions for the practical part, the time of each theoretical session ranged from (30- 60) minutes, and the time of each practical session ranged from (60-90) minutes .Each session started by asummry of the previous session and objectives the new one. Take into consedration,the use of the Arabic language that suit the nurses' education level. During session, each nurse has an opportunity to ask questions and share information with each other. Otherwise, the researcher answered any questions about the guidelines as needed.

Precautionary measures are taken into consideration during data collection and sessions including-: Personal protective materials such as facemask, gloves, antiseptic solution for hand hygiene..Personal distancing to maintain a minimum 1.5m distance.. Avoiding shaking hands or hugging.. Avoid touching one's mouth, nose or eyes to prevent spread of infection.

Motivation and enhancement during sessions were used to enhance sharing in this study. Different teaching methods were used

as lecture, group discussion, brain storming and role- play. The media used were booklet, colored poster, white board, videos, brochure and power point. Evaluation methods as feedback through oral questions were used in sessions of education guidelines. The researcher motivated the studied nurses by encouraged them with words and gave pencils and note books as reward to gain their participation.

The education guidelines were implemented in (8) sessions for all nurses as the following:

A-Theoretical sessionas the following, first session, it was focused on identification of the objectives of the study and its expected out comes, definition the meconium aspiration (MAS) and meconium composition**,** and pathophysiology of MAS .**Second session**: it was focused on , common causes of MAS , risk factors of MAS , signs and symptoms of MAS, and management of MAS.**Third session**: it was focused on , treatment methods for neonates with MAS, common complication of MAS , immediate neonatal care, and Apgar score

B-Practical sessions:- Fourth session: it was focused on**,** neonatal resuscitation care, the importance for neonatal resuscitation. And steps of neonatal resuscitation in case of MAS.**Fifth session**: it was focused on, the steps of endotracheal intubation.**, i**mportance of oxygen therapy.**, i**ndication of oxygen therapy in neonates and nursing care for neonates on oxygen therapy .**Sixth session**: it was focused on:, nursing care during capillary blood gases.**,** indications for chest physiotherapy, common position used drainage chest physiotherapy, contraindications of frequent positioning., indications and precautions taken during suction., complications from in appropriate suctioning , appropriate catheter for suctioning , types of suctioning, and nursing care before, during and after suctioning. **Seventh session**: it was focused on **,** indication of CPAP **,** nursing care of neonates on N.CPAP, definition of neonatal mechanical ventilation and its mechanism of action., indications for mechanical ventilation, different parameters of mechanical ventilation, and nursing care before, during and after connection to mechanical ventilato. **Eighth session:** it was focused on, methods of spread the infection**,** symptoms of infection , prevention methods of infection

Evaluation phase:

Evaluation was carried out after completion of the guideline contents on the nurses' knowledge and practice. Reassessment was done using the same tools after implementation of the guideline was evaluated immediately after implementing the educational guideline the past test will administered by using the same pretest tools .

Statistical Analysis

The collected data was organized, analyzed and tabulated using appropriate statistical methods. Data were extracted from the interview questionnaire and computerized in Microsoft Excel 2019. Statistical analysis was done by IBM SPSS (statistical package for social science) version 22.0. Qualitative data were represented using numbers and percentages. Quantitative data were described as mean and standard deviation. Chi-Square Test was used to examine the relationship between two qualitative variables. Spearman Correlation Analysis was used to assess the strength of association between two quantitative variables. The correlation coefficient defines the strength and direction of the linear relationship between two variables. A significant level values was considered when the p-value ≤ 0.05, while a highly significant level value was considered

when the p-value ≤ 0.001, and p-value > 0.05 indicates non-significant results.

Results:

Table (1): Showed that, less than one third (32.3%) of nurses were in the age group 30>35 years .Regarding gender, 95.2% of nurses were females. Regarding to educational level, slightly less than half (48.4%) of them had Bachelor degree in nursing science. As regards to position, less than half (16.1%) of them were nurse specialist. As regards to years of experience, more than two fifth (43.5%) of the studied nurses had experience more than 15 years. Regarding previous training courses, less than two thirds (61.3%) of them didn't attend any training courses about meconium aspiration syndrome.

Table (2): Revealed that, slightly more than one third (33.9%) of them were delivered at 34 - >37 weeks of gestation. As regards to their current age, most of them (87.1%) at 12 to 24 hours.. In relation to weight at delivery, slightly more than one third (33.9%) of them had 2000 -> 2500 grams and, more than one third of them (35.5%) had current weight 1500->2000 grams.

Figure (1): Represented that, the majority of the studied nurses(83.9%)had good level of total knowledge about care of neonates suffering from meconium aspiration syndrome post-educational guidelines implementation, compared to slightly more than one third 33.9% pre-educational guidelines implementation.

Figure(2): showed that ,the majority of the studied nurses(90.3%) had competent level of total practice in post educational guidelines implementation compared to slightly more than one third (33.9%)pre educational guidelines implementation.

Table (3): Represented that, there were no statistically significant relation between nurses' age, educational level with their total level of knowledge at pre and post educational guideline implementation (P>0.05). On the other hand, there were statistically significant relations between nurses' gender with their total level of knowledge at pre and post educational guidelines implementation (P≤0.05). In addition, there were statistically significant relation between previous training and level of knowledge at the pre- guideline phase (p≤ 0.05).

Table (4): Illustrated that, there were no statistically significant relation between nurses' gender, educational level and, previous training, with their total practice at the pre and post educational guidelines implementation (P>0.05) while there was statistical significant relation between nurses' age with their total practice post educational guidelines implementation at(P≤0.05).

Table (5): Represented that, there was a positive correlation between nurses' total knowledge and total practice at pre and post educational guidelines implementation.

Table (1): Percentage distribution of the studied nurses according to their characteristics (n= 62)

Nurses' characteristics	No.	%
Age (years)		
20->25	5	8.1
25 - >30	18	29.0
30->35	20	**32.3**
35->40	11	17.7
≥ 40	8	12.9
Mean ± SD	34.29 ± 7.625	
Gender		
Male	3	4.8
Female	59	95.2
Educational level		
Diploma of secondary nursing school	7	11.3
Technical institutes of nursing	15	24.2
Bachelor in nursing science	**30**	**48.4**
Post graduate in nursing	10	16.1
Position		
Nurse specialist	10	**16.1**
Staff nurse	52	83.9
Years of experience related to neonatal care		
>5 years	17	27.4
5->10	5	8.1
10->15	13	21.0
≥15	27	**43.5**
Mean ± SD	14.63 ± 6.357	
Previous training courses		
Yes	24	38.7
No	38	**61.3**
Number of training courses regarding MAS (n= 24)		
Once	12	50.0
Twice	12	50.0

Table (2): Percentage distribution of the studied neonates according to their characteristics (n= 62)

Neonates' characteristics	No.	%
Gestational age (weeks)		
Less than 30	9	14.5
30->34	13	21.0
34->37	21	**33.9**
37≤	19	30.6
Current age (hours)		
Less than 12	8	12.9
12-24 hrs	54	**87.1**
Gender		
Male	15	24.2
Female	47	75.8
Type of delivery		
Vaginal delivery	35	**56.5**
Cesarean section	27	43.5
Weight at delivery (grams)		
1000->1500	6	9.7
1500->2000	19	30.6
2000->2500	21	**33.9**
2500->3000	5	8.1
More than 3000	11	17.7
Current weight (grams)		
1000->1500	7	11.3
1500->2000	22	**35.5**
2000 ->2500	21	33.8
2500->3000	7	11.3
More than 3000	5	8.1

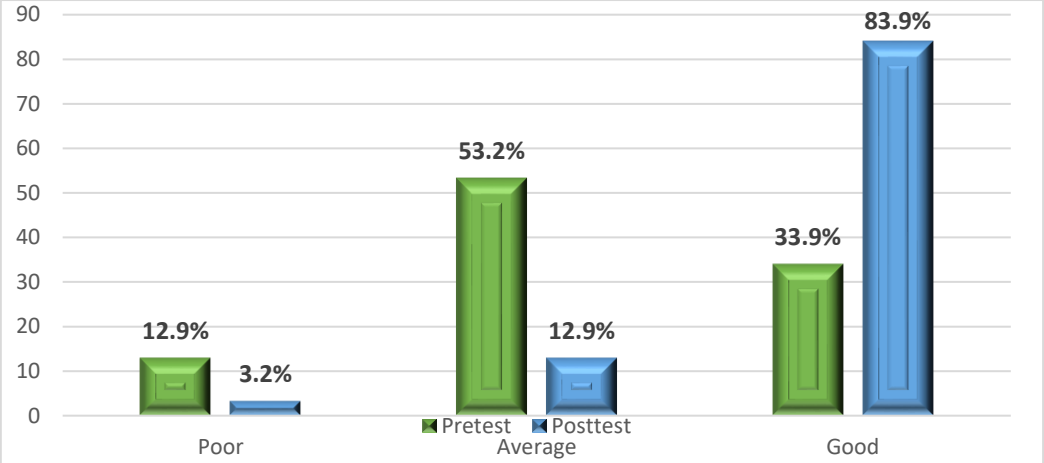

Figure (1): Total knowledge level of the studied nurse regarding care of neonates with meconium aspiration syndrome (n= 62)

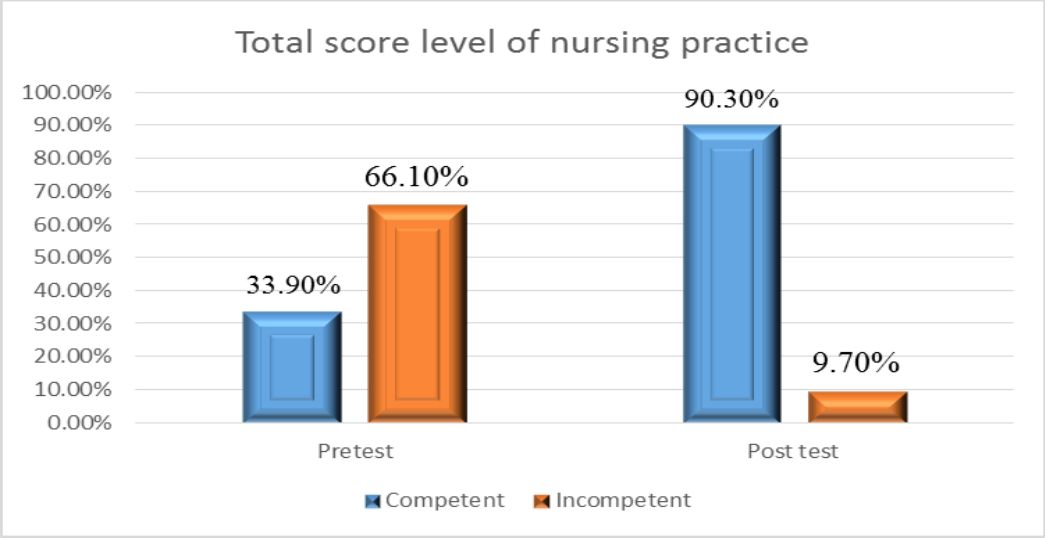

Figure (2): Total score of practice regarding nursing care for neonates with meconium aspiration syndrome pre/post educational guidelines implementation (n=62)

Table (3): Relation between nurses' characteristics and their total knowledge pre and post guidelines implementation (n= 62)

Nurses' characteristics	Pre educational guidelines implementation (n= 62)								Post educational guidelines implementation (n= 62)							
	Good(n=8)		Average(n=33)		Poor(n=21)		Significance		Good(n=52)		Average(n=8)		Poor(n=2)		Significance	
	No.	%	No.	%	No.	%	X2	P	No.	%	No.	%	No.	%	X2	P
Age (years)																
20-<25	0	0	4	6.5	1	1.6	8.901	0.351	3	4.8	1	1.6	1	1.6	10.592	0.226
25-<30	1	1.6	11	17.7	6	9.7			14	22.6	3	4.8	1	1.6		
30-<35	5	8.1	9	14.5	6	9.7			16	25.8	4	6.5	0	0		
35-<40	2	3.2	6	9.7	3	4.8			11	17.7	0	0	0	0		
≥ 40	0	0	3	4.8	5	8.1			8	12.9	0	0	0	0		
Gender																
Male	1	3.2	0	6.5	2	9.7	5.411	0.041*	1	1.6	1	1.6	1	1.6	7.517	0.027*
Female	7	9.7	33	46.7	22	24.2			51	82.3	7	11.3	1	1.6		
Education																
Nursing school	0	0	5	8.1	2	3.2	9.154	0.165	7	11.3	0	0	0	0	3.736	0.712
Technical nursing institutes	1	1.6	9	14.5	5	8.1			13	21	2	3.2	0	0		
Bachelor degree	3	4.8	15	24.2	12	19.4			24	38.7	4	6.5	2	3.2		
Post graduate	4	6.5	4	6.5	2	3.2			8	12	2	3.2	0	0		
Years of experience																
Less than 5 years	2	3.2	10	16.1	5	8.1	8.794	0.185	16	25.8	0	0	1	1.6	6.276	0.393
5-<10	1	1.6	3	4.8	1	1.6			4	6.5	1	1.6	0	0		
10-<15	4	6.5	7	11.3	2	3.2			9	14.5	3	4.8	1	1.6		
>15	1	1.6	13	21	13	21			23	37.1	4	6.5	0	0		
Previous training																
Yes	6	21.0	10	16.1	8	1.6	7.642	0.020*	22	35.5	1	1.6	1	1.6	2.823	0.304
No	2	12.9	23	37.1	13	11.3			30	48.4	7	11.3	1	1.6		

Table (4): Relation between nurses' characteristics and their total practice pre/post educational guidelines implementation (n=62)

Nurses' characteristics	Pre educational guidelines implementation (n= 62)						Post educational guidelines implementation (n= 62)					
	Satisfactory(n=21)		Un satisfactory(n=41)		Significance		Satisfactory (n=56)		Un satisfactory(n=6)		Significance	
	No.	%	No.	%	X2	p	No.	%	No.	%	X2	P
Age (years)												
20-<25	2	3.2	3	4.8	4.266	0.371	5	8.1	0	0	8.230	0.048*
25-<30	4	6.5	14	22.6			18	29	0	0		
30-<35	6	9.7	14	22.6			16	25.8	4	6.5		
35-<40	4	6.5	7	11.3			11	17.7	0	0		
≥ 40	5	8.1	3	4.8			6	9.7	2	3.2		
Gender												
Male	0	0.0	3	4.8	2.559	0.545	3	4.8	0	0.0	0.627	0.429
Female	21	33.9	38	61.3			53	85.5	6	9.7		
Education												
Nursing school	3	4.8	4	6.5	0.772	0.856	5	8.1	2	3.2	3.327	0.344
Technical nursing institutes	6	9.7	9	14.5			14	22.6	1	1.6		
Bachelor degree	9	14.5	21	33.9			28	45.2	2	3.2		
Post graduate	3	4.8	7	11.3			9	14.5	1	1.6		
Years of experience												
Less than 5 years	5	8.1	12	19.4	0.361	0.948	17	27.3	0	0	8.611	0.035*
5->10	2	3.2	3	4.8			5	8.1	0	0		
10->15	5	8.1	8	12.9			13	21	0	0		
<15	9	14.5	18	29			21	33.9	6	9.7		
Previous training courses												
Yes	7	11.3	17	27.4	0.391	0.591	21	33.9	3	4.8	0.349	0.669
No	14	22.6	24	38.7			35	56.5	3	4.8		

Table (4): Represented that, there was a positive correlation between nurses' total knowledge and total practice at pre and post educational guidelines implementation

Variables	Total practice			
	Pre educational guidelines implementation		Post educational guidelines implementation	
	r	P-value	r	P-value
Total knowledge	0.226	0.078	0.143	0.267

Discussion:

Meconium aspiration syndrome (MAS) is a neonatal respiratory distress that occurs in the context of meconium-stained amniotic fluid when respiratory symptoms cannot be attributed to another etiology **(Carmona & Sayad, 2022).** Moreover, MAS is an important cause of morbidity and mortality in neonates that need close observation and management; as well as they need closed observation to prevent other complications **(Kumar et al., 2019).**

Concerning nurses' characteristics, the finding of the current study revealed that, less than one third of the studied nurses were in the age group 30<35 years. This finding was supported by **Mohammed & Abou Zed (2019**) who conducted a study "Evaluate the effect of instructional guidelines on nurses' performance regarding care of high risk neonates undergoing surfactant replacement therapy", and found that less than one third (32.0%) of nurses were in the age group more than 30 years. From the researcher point of view, the neonatal intensive care unit is one of the most places that need great effort. So, nurses in this age group 30<35 years are distributed to maintain a good level of practice for neonates .

Regarding gender of the studied nurses, the present study clarifed that, the majority of the studied nurses were females. This finding may be due to the few numbers of males in nursing profession as males are recently allowed to join to nursing schools and colleges in Egypt. This finding goes on the same context with, **Elsobkey & Amer (2018),** who carried out a study of "Effect of educational guidelines program about nursing care of[illegible] positive airway pressure (CPAP) in "NICU", and found that, most (81.3%) of nurses were females.

As regards the characteristics of the studied neonates, the finding of the current study revealed that, less than one quarter of the studied neonates were males, these findings were contrast with **Prasanna et al, (2021),** whose study entitled "A study of factors causing meconium stained amniotic fluid and it's impact on perinatal outcome", and found that, less than half of the studied sample were males .

As regards neonates' weight at delivery, the ongoing study concluded that, slightly more than one third of studied neonates had weight from 2000<2500 gms. This study finding were supported by those of a study by **Bhutani (2018),** who studied developing a systems approach to prevent meconium aspiration syndrome" and found that, most of neonates' weight of the studied sample was 2000<3000 gms. This could be attributed to the fact that most neonates with MAS delivered by prolonged labor and the end of GA period with completion of the weight.

The present study revealed that more than two quarters of studied neonates were delivered by caesarean section. This result was in accordance with the study **Chiruvolu & Wiswell (2022),** who studied "Appropriate management of the nonvigorous meconium-stained new born meconium" and found that less than half of neonates delivered by caesarean section .

The current study findings mentioned that slightly more than two fifths of neonates were need Mechanical ventilator, this finding was incompatible with **Nangia., et al, (2021),** who

studied, "Tracheal suction at birth in non-vigorous neonates born through meconium-stained amniotic fluid", who found, that the most of neonates need immediate endotracheal tube.

Regarding total nurses' knowledge about nursing care of neonates with meconium aspiration syndrome , the current study revealed that, the majority of the studied nurses had good level of total knowledge about care of neonates suffering from meconium aspiration syndrome post-educational guidelines implementation, compared to slightly more than one third pre-educational guidelines implementation. This finding was sustained by **Guang et al., (2021),** whose study entitled, "Clinical features and prognosis of severe meconium aspiration syndrome with acute respiratory distress syndrome", who found that, the educational guidelines had appositive effect in improving the level of nurses with statistically significant improvement observed between pre and post-tests. This emphasized the importance of educational guidelines in improving nurses' knowledge as it provide them with the baseline information about meconium aspiration syndrome and its prevention and management.

As regards to total level of the studied nurses' practices regarding nursing care for neonates with meconium aspiration syndrome , the current study portrayed that, the majority of the studied nurses had competent level of total practice in post educational guidelines implementation compared to slightly more than one third pre educational guidelines implementation. These findings were consistent with **Mohammed & Abou Zed (2019)**, who found that, the total level of nurses' practice regarding hand washing, vital signs, suctioning, endotracheal tube care, capillary blood sampling, nursing care for neonates undergoing CPAP and mechanical ventilator were good, and the total score of practice were improved after the educational program implementation.

As noticed by the findings of the current study regarding the relation between nurses' characteristics and total level of knowledge , there were no statistically significant relation between nurses' age, educational level with their total level of knowledge at pre and post educational guideline implementation. These findings were similar to **Hammod & Mohammed (2016),** who studied the ''Effectiveness of an educational program on nurses' knowledge concerning complications prevention of mechanical ventilation at intensive care unit in Al- Hussain Teaching Hospital" showed that there was no statistical relation between total nurses' knowledge and general characteristics. Also, these findings were consistent with, **Al Wily & Aziz (2020)** who observed that there was no statistically relation between demographic variables and total level of knowledge .

According to the relation between total nurses' practice and their characteristics (Table 28). The current study indicated that, there were no statistically significant relation between nurses' gender, educational level and, previous training, with their total practice at the pre and post educational guidelines implementation. These findings were dis agreed with **Ahmed et al. (2020),** who illustrated that, there was a statistical significant relation between general characteristics (age, level of education, and years of experience) in NICU and level of practices in NICU. Meanwhile, **Hussein & Abbas (2021**) mentioned that, nurses' socio- demographic and professional variable were no significant effect on their performance.

Concerning correlation between nurses' total knowledge and total practice pre/post the educational guideline. The present study illustrated that, there was a positive correlation between nurses' total knowledge and total practice at pre and post educational guidelines implementation. The researcher clarified that the increase of knowledge should be associated with

an increase in level of practices especially at NICU. This finding was supported by **Saleh et al., (2015**), in a study entitled " instructional guidelines for enhancing nurses' performance caring for neonates suffering from meconium aspiration" found that, the guidelines had a role in enhancement of neonatal nurses' performance and there was a positive correlation between nurses' total knowledge and total practice at pre and post educational guidelines implementation . Additionally, this finding was parallel to **Goel et al., (2015),** who studied " meconium aspiration: challenge and solution", mentioned that, there was a correlation between knowledge and practice of the studied sample with high improvement in nurses' performance post intervention.

Conclusion:

The research hypotheses are accepted, and the educational guidelines program had a significant positive effect in improving nurses' knowledge and practice regarding the care of neonates suffering from meconium aspiration syndrome. Besides, there was a positive correlation between nurses' total knowledge and total practice at pre and post educational guidelines implementation.

Recommendations:

- Conducting regular training program and workshops for nurses regarding care of neonates with meconium aspiration syndrome.
- Further studies should be conducted to replicate the study on a larger sample and multiple settings for generalization of results.
- Resuscitation should follow the same principles for neonates with meconium-stained fluid as for those with clear fluid.

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تأثير الإرشادات التعليمية على أداء الممرضين تجاه الأطفال حديثي الولادة الذين يعانون من متلازمة استنشاق العقي

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متلازمة استنشاق العقي هي حالة مرضية تصيب الاطفال حديثى الولاده الذين يولدون من خلال السائل الأمنيوسي المصبوغ بالعقى وتسبب فشل الجهاز التنفسي و يتم تصنيفها على أنها ضائقة تنفسية تتحتاج تدخل من الفريق الطبيى وتقوم الممرضة بمتاعة العلامات الحيوية والحفاظ على درجة الحرارة .لذلك فان الارشادات التعليمية لها تأثير كبير فى تحسين أداء الممرضين والممرضات تجاة الاطفال حديثى الولادة المصابين بمتلازمة استنشاق العقى. لذلك هدفت هذه الدراسة إلى تقييم تأثير الإرشادات التعليمية على أداء الممرضين تجاه الاطفال حديثي الولادة الذين يعانون من متلازمة شفط العقي .تم اجراء هذه الدراسة داخل وحدات العناية المركزة لحديثي الولادة بمستشفى الأطفال التخصصي ببنها واشتملت عينة الدراسة على (62) من الممرضين والأطفال حديثي الولادة مصاب بمتلازمة استنشاق العقى (62). وأظهرت الدراسة أن الغالبية العظمي من الممرضين يتمتعن بمستوى جيد من المعرفة الكلية حول رعاية الأطفال حديثي الولادة الذين يعانون من متلازمة استنشاق بعد تطبيق الارشادات التعليمية مقارنة ب أقل من نصفهم ما قبل تطبيق الارشادات ,و أن الغالبية العظمي من الممرضين لديهم مستوى مرتفع للممارسة الكلية في تطبيق الإرشادات بعد تطبيق الارشادات التعليمية مقارنة بنسبة اقل من نصفهم قبل تطبيق الارشادات التعليمية. حيث كشفت النتائج عن أن الارشادات التعليمية على أداء الممرضين فعالة في تحسين معلومات وأداء الممرضين تجاه الاطفال حديثى الولادة المصابين بمتلازمة استنشاق العقى. كما أوصت الدراسة بأهمية أجراء برنامج لتدريب الممرضين المسؤلين عن رعاية الاطفال خديثى الولادة المصابين بمتلازمة استنشاق العقى.