Assessment of Nurses' Knowledge Regarding Short Term Symptoms of Neonates with Neonatal Abstinence Syndrome

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Abstract

Background: Nurses' knowledge significantly impacts the care of neonates with Neonatal Abstinence Syndrome. Adequate knowledge allows nurses to accurately assess short symptoms and provide the neonates with appropriate interventions and can reduce complication. **Aim:** The present study was aimed to assess nurses' knowledge regarding short term symptoms of neonates with neonatal abstinence syndrome. **Design:** A descriptive research design was utilized. **Setting:** The study was conducted at Intensive Care Unit of El Menshawy and Tala hospital, which are affiliated to Ministry of Health and population **Subject:** sixty nurses and neonates who attended the previously mentioned settings were involved. **Tools:** two tools were used, **Tool I**: Nurses' knowledge regarding Neonatal Abstinence Syndrome questionnaire.**Tool II:** Modified Finnegan Neonatal Abstinence Syndrome Scoring tool. **Result:** the majority of studied nurses had low level of knowledge regarding Neonatal abstinence syndrome. there was no statistically significant relation between neonates' total score of modified Finnegan neonatal abstinence syndrome and their socio-demographic characteristics of studied neonates **Conclusion:** the total level of knowledge of the studied nurses were unsatisfactory regarding short term symptoms of neonates with neonatal abstinence syndrome. **Recommendation:** educational program should be applied at Neonatal Intensive Care Units as one of the nursing interventions aiming to improve nurses' knowledge to provide high quality care for neonates with neonatal abstinence syndrome.

Keywords: Knowledge, Neonatal abstinence syndrome, short term symptoms

Introduction

Neonatal Abstinence Syndrome (NAS) is a classification for the group of problems that occur in a newborn due to withdrawal symptoms from in utero exposure to opioid drugs or after delivery. Regular maternal drug use during the last two weeks preceding birth is a risk factor for neonatal abstinence syndrome **(Shan& MacVicar, 2020)**.The impact of opioid drugs in a pregnant woman is profound, not only on her health and wellbeing, but also on that of her fetus and subsequent newborn. Over the past few decades, the United States has been during an opioid epidemic. A widespread epidemic has impacted individuals across all demographics, including pregnant women. As a result, there has been a rise in the number of newborns exposed to drugs either during pregnancy or shortly after delivery. Many of these infants experience withdrawal symptoms soon after birth, a condition referred to as neonatal abstinence syndrome. **(Jilani & Jones, 2021)**

The incidence of the neonatal abstinence syndrome has increased 82% nationally from 2010 to 2017 It was diagnosed every 1,000 neonates, One study suggests there is one neonate diagnosed with neonatal abstinence syndrome every 25 minutes, which equals between 2 to 7 neonates out of every 1,000 births. Approximately one neonate is diagnosed with neonatal abstinence syndrome every 19 minutes in the United Satiates. **(Daniel et al., 2020)**

Neonatal abstinence syndrome is a condition affecting multiple body systems, caused by the sudden discontinuation of drug exposure in newborns whose mothers used or misused substances during pregnancy. Substance use by mothers during pregnancy poses a significant risk for adverse outcomes in both the pregnancy and the newborn. Infants who are vulnerable to Neonatal Abstinence Syndrome also face higher chances of being born prematurely, having a low birth weight, or experiencing restricted growth in the womb. Additionally, drug use during pregnancy often reflects broader social and

environmental challenges that may lead to mental, physical, and developmental difficulties for the infant **(Patrick, 2020).**

Neonates exposed to opioids either before birth (in utero) or after delivery due to medical conditions may experience a broad range of negative symptoms. These symptoms can impact multiple body systems, including the autonomic and central nervous systems, as well as the respiratory and gastrointestinal systems. The severity of these symptoms can vary from mild to severe **(Petrich et al., 2022).**

Withdrawal symptoms in affected newborns may include fever, rapid breathing, sweating, tremors, difficulty feeding, weight loss, seizures, persistent crying, frequent sneezing and yawning, excessive sucking, vomiting, diarrhea, and skin irritation across the body. These symptoms can appear with different levels of intensity or may not appear at all. In more severe cases, infants often need extended and expensive care in neonatal intensive care units **(Pahl et al., 2020).**

The first line of treatment of Neonatal Abstinence Syndrome includes both pharmacological and non-pharmacological interventions, Morphine is the most common pharmacological interventions are used and non-pharmacological interventions care which is less controversial, more cost-effective, and may help shorten the average duration of hospitalization **(Lee H. & Cho H. 2023)**

Conducting assessments and utilizing standardized scoring tools enable healthcare providers to implement suitable interventions for managing neonatal abstinence syndrome (NAS). The Finnegan Neonatal Abstinence Scoring Tool (FNAST) is the most widely used method, helping to evaluate the severity of NAS symptoms and inform treatment decisions accordingly **(Kocherlakota et al., 2020**)

The Finnegan Neonatal Abstinence Scoring Tool is also used to assess the effectiveness of treatment and recovery of the neonates. Assessment is performed and then scored. A daily score is calculated.

The decision to treat the neonate may be based upon a higher score and help the clinician experience to guide treat. **(Goyal S& Saunders KC, 2020)**

The nurse professional has a responsibility of creating and healing environment. conducive to the healing process in monitoring and reducing noise levels, Lighting should be adjustable, neonate's should be provided with developmentally supportive positioning to optimize musculoskeletal development and behavioral response organization, provide opportunities for kangaroo care when possible, minimize stress by reduce the neonate's exposure to noxious. **(Blackwood & Cadet 2021)**

Significance of the study:

Nurses' knowledge was direct impact on neonate's quality care and improving outcome of neonates with neonatal abstinence syndrome. The first line of treatment should always be non-pharmacological interventions included, developmental supportive care as comfort measure, tight swaddling with light weight blankets, providing quite environment, manage lighting environment, comfortable position, encouraging frequent uninterrupted rest periods and appropriate breast feeding **(Haaland et al, 2022)**

The number of cases of Neonatal Abstinence Syndrome (NAS) has steadily increased in recent years, emphasizing the importance of healthcare providers being equipped to identify and effectively address its complications. Infants with NAS face considerable risks of long-term neurodevelopmental issues and increased mortality **(Curran et al., 2020).**

The Aim of the Study

The present study was aimed to assess nurses' knowledge regarding short term symptoms of neonates with neonatal abstinence syndrome

Research questions

1- What is nurses' knowledge regarding short term symptoms of neonates with neonatal abstinence syndrome?

2- What are nurses' knowledge regarding Modified Finnegan

scorning tool of neonates with neonatal abstinence syndrome?

Subjects and methods:

Research design:

A descriptive research design was used in the current study.

Setting:

The present study was conducted at two Neonatal Intensive Care Unit at El- Manshawy Hospital El-gharbia Governorate and Tala Hospital EL-Menoufia Governorate, which are affiliated to Ministry of Health and Population.

Subject:

A Purposive sampling of (60) nurses and neonates who was admitted in the previously mentioned setting at the time of data collection

40 nurses and neonates at Neonatal Intensive Care Unit (NICU) of tala hospital and 20 at Neonatal Intensive Care Unit of El Manshawy hospital.

Tools of the study

Three tools were utilized as follows:

Tool (1): Structured interview schedule regarding neonatal Abstinence Syndrome.

It was prepared by the researcher after extensive reviewing of recent literatures to collect data. **(Chiang & Grossman, 2019)** It was consisted of three parts:

Part (1): Socio demographic characteristics of nurses:

It was covered the characteristics of the nurses which include age, sex, level of education and attendance of clinical training courses.

Part (2): Socio demographic characteristic of neonates

It covered the characteristics of the neonates which include gestational age, birth weight, length, post-natal age and type of delivery.

Part (3): Nurses' knowledge regarding neonatal abstinence syndrome.

It was developed by the researcher after reviewing the related literature **(Anderson C& CacolaP. 2017)** which includes:

-Nurses' knowledge about neonatal abstinences syndrome such as definition, causes, short term symptoms, behavior response, complications and management of neonates with

neonatal abstinence syndrome.

The total scores of Nurses' knowledge were calculated as follow:

-Less than 60% was considered low level of knowledge. (0-24)

-From 60- 80% was considered moderate level of knowledge. (24-32)

-From 80% and more was considered high level of knowledge. (32-40).

Tool (II): Modified Finnegan Neonatal Abstinence Syndrome Scoring tool.

The Modified Finnegan Neonatal Abstinence Scoring Tool. **(Kunswa M. & Bayoumi O, 2018**) used to assess short symptoms that include: - Central nervous system disturbances, Gastrointestinal disturbances and Respiratory disturbances.

Modified Finnegan Neonatal Abstinence Syndrome was calculated as follows:

Less than 20 were considered mild symptoms-

Less than 30 were considered moderate symptoms–

More than 30 were considered sever symptoms.

Methods:

The study was accomplished through the following steps:

Administrative Process

To carry out this study, an official permission for data collection was obtained from the Dean of the Faculty of Nursing, Tanta University directed to administrators responsible for the selected hospitals.

Ethical considerations

-Ethical approval was taken from the Scientific Research Ethics Committee of the Faculty of Nursing, Tanta University before conducting the study code No. 239/4/2023

-Confidentiality and privacy were taken into consideration regarding the data collection and was maintained by coding number

-Nature of the study didn’t cause any harm or pain to the entire sample.

-Nurses' informed consents to participate in this study were obtained after explanation of the aim and benefits of the current study. The nurses had the right to withdraw from the study at any time.

Tools development

Two tools were developed by the researcher after reviewing of recent literatures and under the supervision of the supervisors.

Content validity

A jury of five experts in the field of Pediatric Nursing to check content validity and clarity of the questionnaire. Modifications were carried out accordingly.Content validity index 98.5%.

Reliability test

Testing reliability of proposed tools was done by using Cronbach's alpha coefficient test. It was 0,762 for tool (I) "Nurses knowledge" and 0.861 for tool (II) "Modified Finnegan neonatal abstinence syndrome" Which indicates that the two tools were reliable to detect the objectives of the study.

Pilot study:

A pilot study was carried out on 10% of nurses and neonates (6 nurses and neonates). It study was done to test the tool for its clarity, applicability, feasibility to determine any obstacles that my encountered the researcher during the period of data collection. Pilot study was excluded from the total sample.

Statistical analysis

Data was entered and analyzed by using SPSS statistical package version 27. Graphics were done using Excel program. Quantitative data were presented by mean ($\bar{X}$) and Standard Deviation (SD). Qualitative data were presented in the form of frequency distribution tables, number and percentage. It was analyzed by chi-square ($\chi 2$) test, ANOVA test (F), Pearson's correlation ®, and Friedman test (Fr). Level of significance was set as P value <0.05 for all significant tests.

Result:

Table (1): Shows percentage distribution of the studied nurses according to their biosocial characteristics. It was revealed that 48.3% of the studied nurses aged between 30<40 years old with the mean age of 31.17±5.63 years Moreover, 95% of them were female, and 56.7% of them had bachelor's degree of nursing science. Also, half of the studied nurses (50%) had 5-10 years of experience in Neonatal Intensive

Care Unit. This table also revealed that all the studied nurses didn't attend any courses related to neonatal abstinence syndrome.

Table (2): Shows percentage distribution of the studied neonates according to their biosocial characteristics. It was clear that 75% of the studied neonates their gestational age were in between 37 to less than 42 weeks gestation with the mean age of 37.13± 1.94 weeks. Moreover, 55% of them their birth weights were between 2500 to less than 4000 gram and 61.7% of them their length at birth were between 48 and less than 50 cm. This table also reveals that 56.7% of studied neonates were delivered by the cesarean section.

Table (3): Shows percentage distribution of studied nurses related to their knowledge regarding neonatal abstinence syndrome. It was observed that all of studied nurse's answer were incomplete and corrected about definition of neonatal abstinence syndrome, while all nurses and 46.7% of them gave complete and correct answer. Regarding causes of neonatal abstinence syndrome it was found that 48.3% of studied nurses gave incomplete correct answer, while all nurses and 60% of them gave complete and correct answer. Concerning manifestation of neonatal abstinence syndrome it was found that 75% of studied nurses gave incomplete correct answer, while all nurses and 56.7% of them gave complete and correct answer

Table (4): Illustrates percentage distribution of studied neonates regarding disturbances of modified Finnegan neonatal abstinence syndrome. This table reveals that more than three quarters of studied neonates had moderate disturbance of modified Finnegan about central nervous system while 6.6% of them had sever disturbances. It was observed that 38.3% of studied neonates had moderate disturbance of modified Finnegan about metabolic, vasomotor and respiratory disturbances. While one quarter of them had sever disturbances.

Regarding gastrointestinal disturbances. It was observed that

80% of studied neonates had severed disturbance of modified Finnegan while 8.3% of them had moderate disturbances.

Table (5): Shows relation between the socio-demographic characteristics of the studied neonates on their total score of modified Finnegan neonatal abstinence syndrome. It was noticed that there was no statistically significant relation between neonates' total score of modified Finnegan neonatal abstinence syndrome and their socio-demographic characteristics of studied neonates.

Table (1): Percentage Distribution of the Nurses Studied According to their Biosocial Characteristics.

Socio- demographic characteristics	(n=60)	
	No	%
Age in years		
20<30 yrs.	25	41.7
30<40 yrs.	**29**	**48.3**
≥40 yrs.	6	10
Mean ±SD 5.63±31.17		
Gender		
Male	3	5
Female	**57**	**95**
Qualifications		
Diploma	14	23.3
Bachelor of Nursing Science	**34**	**56.7**
Postgraduate studies	12	20
Years of experience		
<5 years	20	33.3
5-10 years	**30**	**50**
>10 years	10	16.7
Mean ±SD 3.91 ± 6.70		
Previous training courses about neonatal abstinence syndrome		
Yes	0	0
No	60	100

Table (2): Percentage distribution of the studied neonates according to their biosocial characteristics.

Socio- demographic characteristics	(n=60)	
	No.	%
Gestational age		
< 37 weeks.	15	25
37-<42 weeks	**45**	**75**
≥42 weeks	0	0
Mean ±SD 37.13± 1.94		
Birth weight		
<1000 gram	0	0
1000-< 1500 gram	2	3.3
1500-<2500 gram	25	41.7
2500-<4000 gram	**33**	**55**
Mean ±SD 2432.50± 450.31		
Birth length		
48-<50 cm	**37**	**61.7**
50-<52 cm	23	38.3
52-<54 cm	0	0
≥54 cm	0	0
Mean ±SD 49.28± 0.90		
Type of delivery		
Normal	26	43.3
Cesarean section	34	56.7

Table (3): Percentage Distribution of Studied Nurses related to their Knowledge regarding Neonatal Abstinence Syndrome. (n= 60)

Total knowledge level about neonatal abstinence syndrome	Complete correct answer		Incomplete correct answer		Incorrect answer	
	No	%	No	%	No	%
Definition	0	0	60	100	0	0
Causes	0	0	29	48.3	31	51.7
Manifestation	0	0	45	75	15	25
Behavioral responses	0	0	15	25	45	27
feeding behavior	0	0	45	75	15	25
Short-term complication	6	10	51	85	3	5
Long-term complication	0	0	41	68.4	19	31.7
goal of nursing care	0	0	43	71.7	17	28.3
Nursing care	0	0	53	88.3	7	11.7
Factor that determines choice & duration of medication	2	3.3	45	75	13	21.7

Table (4): Percentage Distribution of Studied Neonates regarding Disturbances of Modified Finnegan Neonatal Abstinence Syndrome (n= 60)

Disturbances of modified Finnegan related to studied neonates with neonatal abstinence syndrome		No	%
Central nervous system disturbances	**Mild**	10	16.7
	Moderate	46	76.7
	Severe	4	6.6
Metabolic, vasomotor and respiratory disturbances	**Mild**	22	36.7
	Moderate	23	38.3
	Severe	15	25
Gastrointestinal disturbances	**Mild**	7	11.7
	Moderate	5	8.3
	Severe	48	80

Table (5): Relation between the Socio-Demographic Characteristics of the Studied Neonates on their total Score of Modified Finnegan Neonatal Abstinence Syndrome.

Socio-demographic characteristics related to studied neonates	Total score of modified Finnegan neonatal abstinence syndrome (60) Mean±SD
Gestational age	
< 37 weeks.	25.53 ± 3.14
37-<42 weeks	27.47 ± 4.98
t, P-value	1.409, **0.164**
Birth weight	
1000-< 1500 gram	26.50 ± 0.71
1500-<2500 gram	28.16 ± 5.58
2500-<4000 gram	26.12 ± 3.81
F, P-value	1.402, **0.254**
Birth length	
48-<50 cm	27.54 ± 5.21
50-<52 cm	26.09 ± 3.46
t, P-value	1.183, **0.241**
Type of delivery	
Caesarian section	27.18 ± 3.61
Normal vaginal delivery	26.73 ± 5.79
t, P-value	0.366, 0**.716**

Discussion

Neonatal abstinence syndrome (NAS) occurs due to abrupt discontinuation of chronic fetal exposure to substances that were used or abused by the mother during pregnancy. Signs typically manifest 48 to 72 hours after birth but may not occur until 14 days after birth. Opioid exposure is the most common cause of Neonatal abstinence syndrome. Withdrawal signs in these neonates can include Central nervous system disturbances signs such as tremors, seizures and excessive crying. Gastrointestinal disturbances signs include vomiting, diarrhea and poor feeding. Metabolic, vasomotor and respiratory disturbances signs such as fever, nasal stuffiness, yawning and sweating (**McCarty & Braswell, 2022).**

The major role of neonatal nurses in the Neonatal Intensive Care Unit is to promote normal neurological, physical, and emotional development, otherwise, they aim to prevent disabilities and improve outcomes for neonates **(Kolomboy et al., 2022).**

Therefore, nurse's knowledge and practice significantly impact the care of neonates with Neonatal Abstinence Syndrome. Adequate knowledge allows nurses to accurately assess symptoms and provide the neonates with appropriate intervention, effective support and can reduce complication. **(Romisher et al., 2018).**

Regarding the studied nurses' socio-demographic characteristics, the present study revealed that less than half of the studied nurses were in the age category 30-<40 years old with the mean age of (31.17±5.63). Moreover, majority of them are female, and that more than half of them had Bachelor of Nursing. Also, half of the sample had 5-10 years old of experience with mean of (6.70±3.91). While none of them had received previous training courses about neonatal abstinence syndrome **(Salameh & Polivka, 2020).**

This finding in the previous paragraph is consistent with **(Romisher et al., 2018)** who conducted a study "Neonatal abstinence syndrome, exploring nurses' attitudes, knowledge, and practice" in USA, and concluded that the majority being female, and bachelor's prepared. Also, these results were not match with **(Salameh & Polivka, 2020)** who conducted a study on "Knowledge of and perceived competence in trauma-informed care and attitudes of neonatal intensive care unit nurses toward mothers of newborns

with neonatal abstinence syndrome" in USA, and reported that most of participants were in the age group of 30-40, females and didn't receive training courses about neonatal abstinence syndrome.

Regarding the socio-demographic characteristics of studied neonates. The result of the current study related that three quarters of the studied neonates were in the gestational age group 37 to less than 42 weeks, more than half their birth weight were 2500 to less than 4000 gram and their length at birth were between 48 and less than 50 cm. Also, more than half of them were delivered by the cesarean section. The researcher can justify this result as most of them were normal birth weight.

These results are on the same line with **(Kushnir et al., 2023)** entitled "Neonatal abstinence syndrome in infants with prenatal exposure to methadone versus buprenorphine" in USA and concluded that most of neonates were more than 37wks with mean age of (38.5 ± 1.8), and most of them their mean birth weight were (2857 ± 457). Also, more than half of them delivered by the cesarean section.

Nurses' Level of Knowledge regarding Neonatal Abstinence Syndrome

Concerning the acquisition of knowledge the result of current study had, no one answered complete correct answers about definition, causes, manifestation, behavioral and feeding responses, long term complication, the main goal of nursing care and nursing procedures. This may be due to lack of in-service educational program about neonatal abstinence syndrome, no accurate sources of acquisition knowledge and lack of training courses.

This result is supported by **(Draper, 2020)** who studied "developing training to address neonatal nurse knowledge, practice, and perceived attitude for neonatal abstinence syndrome" in USA and stated that registered nurses not correctly answered about symptoms, nursing care and treatment for neonatal abstinence syndrome. Also, **(Tobin, 2018)** was in the same line with the result of current study, who conducted a study entitled "Changing neonatal nurses' perceptions of caring for infants experiencing neonatal abstinence syndrome and their mothers" in Oman with a sample size of 112 nursing students and stated that zero was increased percentage of incorrect answer of the definition, causes, signs and symptoms, and

caring of neonates with neonatal abstinence syndrome.

Concerning the total nurses' knowledge about neonatal abstinence syndrome, the current study revealed that samples studied had low level of knowledge about neonatal abstinence syndrome this may be attributed to the studied nurses had a lack of information about with neonatal abstinence syndrome.

The result of the current study was consistent with **(Draper, 2020)** who concluded that the nurses knowledge about neonatal abstinence syndrome was low. Also, **(Regimbal, 2022)** who studied "Neonatal abstinence syndrome educational intervention and nursing protocol: nursing knowledge and perceptions" in USA was in the same line with the results of the current study and mentioned that nurse's knowledge about neonatal abstinence syndrome was unsatisfied

This result was in congruent with **(El-Ziady et al., 2017)** who conducted a study entitled "Effect of implementing an educational intervention about family centered developmental care on neonatal nurses' knowledge and practices at neonatal intensive care units" in Egypt and reported that more than two fifths of the studied nurses did not know the definition, components, or the importance care of neonates. As well as, less than half, and more than one third of them didn't know the principles of care of neonatal abstinence syndrome.

The studied Neonates' about disturbances of Modified Finnegan Neonatal Abstinence Syndrome scoring system.

Concerning disturbances of modified Finnegan neonatal abstinence syndrome. The present study revealed that the studied neonates' central nervous system, metabolic, vasomotor and respiratory, and gastrointestinal disturbances severity level. This may be due to the neonate's need crucial care early intervention can greatly affect outcomes. Also, the nursing knowledge about modified Finnegan neonatal abstinence syndrome scoring system to determine short symptoms had a lasting effect, which is important for establishing the efficacy and sustainability of the treatment methods used in the study. **(Disher, T., et al 2019)**

These findings done by **(Miller PA & Willier T. 2021)** who conducted a study about "Early detection of neonatal abstinence syndrome by neonatal intensive care unit nurses" in Minnesota was in the same line

with result of current study and concluded that establishing a training program for nurses to care can improve neurodevelopmental and gastrointestinal disturbances of neonates with Neonatal Abstinence Syndrome. Also, the study conducted by **(Mohammed et al., 2024)** reported that neonates exhibited stable behavioral cues, neurological stability and less stress signs after implementation of the developmental supported care.

The present study revealed that there was no statistically significant relation between studied neonates' total score of modified Finnegan neonatal abstinence syndrome and their socio-demographic characteristics This may be due to causes of increase total score of modified Finnegan neonatal abstinence syndrome related to types and amount of used by their mother and period of time the neonates had exposed to the drug while in his mother's pregnant or after birth. **(Anbalagan et al., 2024**)

Finally, considering this discussion, the current study affirms that the nurses had insufficient knowledge and short term symptoms for neonates with neonatal abstinence syndrome. Moreover, the current study showed that revealed the studied neonates' total score of modified Finnegan neonatal abstinence syndrome level.

Conclusion

The current study concluded that the studied nurses had low level and unsatisfactory knowledge of neonatal abstinence syndrome and practices regarding care for neonates with neonatal abstinence syndrome. Finally, the research findings support and answer the research question.

Recommendations

-Neonatal intensive care units should include updated policies related nursing care for neonatal abstinence syndrome.

-Proper pre-service and in-service training for newly recruited nurses and in- service training program for nurses about neonates with neonatal abstinence syndrome to improve their performance

-Encourage research on the long-term outcomes and benefits of nursing educational programs regarding neonatal abstinence syndrome.

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