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Stress Level and Perceived Nurses' Support among Mothers ofInfants and Neonates in Egypt and Saudi Arabia: A Comparative Study.

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Abstract
Background: *Infants and neonates are affecting and being affected by the families specially the mothers. The illness is reflecting negatively on the family in the form of stress and the stress of the families is reflected back on the health and wellbeing of their infants and neonates. Aim:the aim of the current study was to explore stress level and perceived nurses' support among mothers of infants and neonates in Egypt and Saudi Arabia.*
Design and methods: *Descriptive comparative research design was used for the study, Sample: a convenient sample of 100 Egyptian mothers, and 249 of Saudi mothers of infants and neonates admitted in the Paediatric Intensive Care Unit (PICU) and Neonatal Intensive Care Unit (NICU) were included. Tools: Data was obtained bythe following tools: Structured interview questionnaire, Parental Stress Scale and Nurse Parent Support Tool and infants and neonates charts review for related data.Results: the results revealed that,the mean of total overall stress level among Egyptian mothers was(1.07±0.48) while for the Saudi mothers it was (2.07 ± 0.94) and maximum stress in both Egyptian and Saudi mothers was with regard to parental role alteration (1.23±0.61 and 2.47 ± 1.43) respectively. Mean nurses' support was (1.92±0.86) in Egyptian mothers and (3.92 ± 0.86) in Saudi mothers, however Egyptian mothers perceived least support in instrumental support (1.05±0.81) while Saudi mothers perceived least support in the area of appraisal/ esteem (3.77 ± 1.06). Conclusion: Stress levels among Egyptian and Saudi mothers of infants and neonatesinPICU or NICU had a highly significant negative correlation with perceived nurses' support. Recommendationpediatric nurses needimplement family centered measures and support for mothers of infants and neonates in PICU and NICU to reduce their stress level.*
Key words: *Mothers' stress, Paediatric Intensive Care Unit (PICU) Neonatal intensive care unit (NICU), Perceived Nurses' Support, Paediatric Nursing, Egypt, Saudi Arabia*

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I. Introduction

Infants and neonates are affecting and being affected by the families specially the mothers. The illness is reflecting negatively on the family in the form of stress and the stress of the families is reflected back on the health and wellbeing[1]. Illness and hospitalization are great stressors in life. Every parent whose infant get hospitalized go through varied psychological reactions. It is even more stressful when a neonate is admitted for institutionalized care, especially because it is unexpected most of the time, parents experience stress, various psychological, emotional and behavioural reactions when neonates get admitted to intensive care units[2].

Providing care to neonates and infants is a fundamental maternal attachment behaviour, which is being disrupted by the admission to PICU and NICU. Parents experience anxiety, depression, stress, loss of control, and have mixed feelings of inclusion and exclusion related to care for theneonates and infants[3]. Mothers with admitted neonates and infants to PICU and NICU had higher stress levels compared to fathers which may be probably linked to cultural, psychosocial and maternal attachment factors[4].

The PICU and NICU environment itself produces stress for parents with specific routines, machinery and equipment, lights, sounds and visuals. Diverse factors influenced maternal stress in PICU and NICU. Mechanical ventilation, lower birth weight and lower gestation age were predictors of higher anxiety level and depression among mothers of infants admitted to NICU in Jordan[1]. Higher stress levels were related to increased maternal age, prematurity of baby, longer NICU stay and inability to directly breastfeed the neonate[5] Parental stress had a negative correlation with nursing support[6].

All health care providers have the responsibility to understand parental emotional states and support appropriately. Parents expect nurses to provide psychological support to be physically when needed[4]. Parents could cope better when neonate or infant was in a calm environment, staffed by flexible, friendly professionals who promote parental involvement in care in every possible occasion [7]. Majority did not agree about nurses' support towards the emotional states[8].

It was reported that the families need to understand clearly about the patients' problems, progress, treatment and be able to meet the patient frequently[9]. The provision of support and information for parents in the PICU and NICU, is from the health care team as a whole and not only nurses in isolation which contributed to the issue included language barriers, communication issues, cultural issues and hospital policies[10].It was concluded that even though parents perceived nurses' support to theinfants and neonates in the PICU and NICU was good still nurses need to understand that the stress ofthe parents undergo will come back and affect the infants and neonates health and wellbeing as the functioning level and family health is dramatically affected by the experience of infants and neonates admission to PICUs[1].

Nurses in paediatric and neonatal critical care units must be aware of the stressors experienced by the mothers and the needs for support expected from them. Information giving, answering parents questions, empowering parents by teaching them how to care for the infants and neonates, allow mothers to share in care provision, as well as listening to them when they need to express feelings is very essential to reduce stress on thy experience during these critical times. Family centered nursing care is the skill that needed to be done on daily basics by nurses in these critical situations [10].

Family caregivers have a significant responsibility in the care of theinfant in the PICU, the parents have particular needs that should be acknowledged and responded to by nurse clinicians [4]. Even though there is many studies worldwide in this area, there are a few studies reported from Arab countries related to stressors and nurses' support as perceived by mothers with admitted neonates and infants to NICU and PICU and we cannot use the world wide results as the system in our hospitals as well as the culture in our countries differ greatly. The researchers couldn't find researches that compare between Egypt and Saudi Arabia, particularly. Also, the support perceived bymothers of hospitalized infants and neonates of these two countries is under explored. That is why this study is needed to fill the gap of knowledge in this area.

II. Material and Methods

Aim of the study: the aim of the current study was to:

1) Explore stress level among mothers of infants and neonates in PICU and NICU in Egypt and Saudi Arabia.
2) Assess perceived nurses' support among mothers of infants and neonates in PICU and NICU in Egypt and Saudi Arabia.
3) Identify the relationship between stress level and perceived nurses' support among mothers of infants and neonates in PICU and NICU in Egypt and Saudi Arabia.

Research Questions:

Q1: What are the levels of stress among mothers of infants and neonates in PICU and NICU in Egypt and Saudi Arabia?

Q2: What are the levels of nurses' support as perceived by mothers of infants and neonates in PICU and NICU in Egypt and Saudi Arabia?

Q3: Is there a relationship between stress level and perceived nurses' support among mothers of infants and neonates in PICU and NICU in Egypt and Saudi Arabia?

Research design:A descriptive cross-sectional comparativeresearch designwas utilized to achieve the aim of the current study. A non-experimental design is one type of effective research design that is very helpful to the true experimental design except there is one lost criteria; which is randomization [11].

Setting:

The study was conducted in PICU and NICU in Cairo University Specialized Pediatric Hospital (CUSPH) and in Abha Maternity and Pediatric Hospital, andKhamisMushyte Maternity and pediatric hospital , Ministry of Health (MOH), in Asir province of Saudi Arabia.

Subjects:

A Convenient sample of 100Egyptian mother of hospitalized infants and neonates in PICU and NICU in CUSPH and 249 Saudi mothersof hospitalized infants and neonates in PICU and NICU in Abha Maternity and Paediatric Hospital, and KhamisMushyte Maternity and Paediatric hospital, in Asir province of Saudi Arabia. all participated by convenient sampling. The sample size was calculated based on formula.

Data collection tools:

The required tools developed by researchers after reviewing the related literature through the following tools:

1- Structured interview questionnaire: It included one part (22 item) to assess personal data for the mothers as: age, level of education, occupation, experience in years, and place of residence.

2- **Parental stress scale PSS**: ThePSS is a widely tested scale used to assess stress experienced by parents during hospitalization of neonates in the NICU [12]. The scale identifies sources of parental stress and asks the parent whether or not he or she has experienced a particular situation described in the scale. It has a total of 26 items in three sub scales: Sights and sounds of the environment (5 items), Infant's appearance subscale (14 items), and Parental role alterations subscale (7 items). The parent has to rate each item on a scale from 1-5: 1 (not at all stressful), 2 (a little stressful), 3 (moderately stressful), 4(very stressful) and 5 (extremely stressful). The scale scores are calculated by averaging the items for each subscale and total scale: range of possible scores being 1-5. The scale allows three types of scoring: Stress occurrence level (Metric 1), Overall stress level (Metric 2) and frequency or the number of situations or sources of stress experienced by the parent. The scale has been tested widely and has an alpha of subscales ranging from 0.83 to 0.94 [12].
3- **Nurse Parent Support Tool (NPST):**The health care provider support was measured by using the Nurse Parent Support Tool (NPST) by changing its focus from nurse to health care provider/ staff. The author has suggested that it is possible to change the focus of the tool from nurses to staff or doctors to evaluate the support NPST [13] comprises of 21 items, and evaluates four areas of nursing support provided for the parents: (1) supportive communication and provision of information related to the infant's illness, treatments, care, and related issues (9 items); (2) parental esteem/ appraisal support focused on respecting, enhancing, and supporting the parental role(4 items); (3) emotional support to help parents to cope with the emotional responses and needs related to the infant's illness (3 items); and (4) care giving support which focuses on the quality of care provided to the infant (5 items). Parents rate the amount of nursing support they received from the staff on a rating scale: 1, almost never; 2, not very often; 3, some of the time; 4, most of the time; and 5, almost always. Scoring is done by computing averages. The scores range from 1 to 5, with higher scores indicating greater perceived support.

Validity and reliability:

The tools reviewing by 3 experts in pediatric nursingto test the content validity of tools. Reliability of the tools was performed to confirm its consistency tools. The internal consistency of the 3rd tool was high with a Cronbach's alpha of 0.80. Reliability (internal consistency) of the Arabic version of the scale was established among 38 mothers. The Cronbach's alpha for the total scale of the 2nd tool (26 items) was 0.954; and on three sub scales were: Sights and sounds of the environment (0.930), Infant's appearance subscale (0.920), and Parental role alterations subscale (0.963).

Pilot study:

Pilot study was conducted on 10 Egyptian mothers of hospitalized infants and neonates in PICU and NICU in CUSPH and 20 Saudi mothers of infants and neonates hospitalized in PICU and NICU in Abha Maternity and Pediatric Hospital, Saudi Arabia to ensure the clarity of content of tools and to assess the time needed to fill the tools. Minor modifications were done such as restate some wards.Based on the results of the pilot study, nurse who participated in the pilot study was included in the total study sample.

Procedures and methodology:

Official permissions from CUSPH as well as the director of each of AbhaMaternity and Pediatric Hospital, Saudi Arabia were obtained. Mothers of hospitalized infants and neonates in PICU and NICU in were invited to participate in the study. The purpose and the nature of study explained to each mother individually. An oral consent obtained from each of them to get their acceptance as well as to gain their cooperation.The interview conducted for all mothers to fill structured interview questionnaire which covered personal data about mothers: age, level of education, occupation, and place of residence. At the same time, the researchers obtained Parental stress scale PSS and Nurse Parent Support Tool (NPST). This interview took place in the visitors waiting area the time for each interview was (30 - 40mins). Data collection started at March 2018 and finished at December 2018.

Ethical Considerations:

An informed consent was obtained from the mothers after a full description of the aim and the nature of the study. Mothers were informed that participation in the study is voluntary. The researchers informed the mothers about their rights to withdraw from the study at any time without giving any reason and without any effect on their infants or neonates level of given health care. Also, assurance was given to mothers that the information related to them or to their children is confidential.

Statistical Analysis:

A compatible personal computer (PC) was used to store and analyze data. The Statistical Package for Social Studies (SPSS), version 21.0 was used. Data were coded and summarized using mean, standard deviation and crosstabs for quantitative variables, and percent for qualitative variables. The collected data tabulated, and summarized. Data was computerized and analyzed using appropriate descriptive and inferential statistical tests. Qualitative data were expressed as frequency and percentage. A comparison between qualitative variables carried out by using parametric Chi square test. Comparison of means was performed using paired-sample t-test. Correlation among variables was done using Pearson correlation coefficient. Level of significance at $p<0.05$, 0.001 were used as the cut of value for statistical significance.

III. Results

Table (1): Percentage Distribution of Mothers demographic data

Item	Egyptian Mothers (n=100)		Saudi Mothers (n=249)	
	No.	%	No.	%
Age:				
- 21-30years	66	66	145	58.2
- >30 years	34	34	104	41.8
Education:				
- Below Secondary school degree	60	60	66	26.6
- Secondary school degree	24	24	90	36.1
- University degree	16	16	93	37.3
Place of residence:				
-Rural	60	60	99	39.8
-Urban	40	40	150	60.2
Mothers' job:				
- House wife	30	30	193	77.6
- Employed	70	70	56	22.4
Marital Status:				
- Married	76	76	237	95.2
- Divorced/ Widowed	24	24	12	4.8
Number of infants and neonates:				
- one infant	20	20	89	35.8
- Two infants and neonates	30	30	68	27.3
- ≥Three	50	50	92	36.9

This table showed that mother aged between 21-30 years was 66% 57.9% among Egyptian and Saudi mothers respectively. Among Egyptian mothers two thirds of them (66%) received below secondary school education while among the Saudi mothers over one-third of the mothers were educated up to secondary/ higher secondary school (36.1%) or had completed graduation (37.3%). While 60% of Egyptian mothers resided in rural area there was60.5% of Saudi mothers resided in urban area.While more than two thirds (70%) of Egyptian mothers were employed 77.6% of Saudi mothers were house wives. Above three quarters (76%) of Egyptian mothers were married and 24% of the were either divorced or widowed while the Saudi mothers only small proportion (4.9%) was divorced/ widowed. Half of the Egyptian mothers had three infants and neonates or more, 30% had two and only 20% had one infant while the percentages among Saudi mothers were (36.9%, 27.3%, and 35.8%) respectively.

Table (2) Percentage Distribution of Presence of Good Emotional Support for The Mothers

Item	Egyptian Mothers (n=100)		Saudi Mothers (n=249)	
	No.	%	No.	%
Presence of Good Support System				
- Yes	43	43	152	61.1
- No	57	57	97	38.9

Table (2) illustrated that more than half of Egyptian mothers (57%) reported that they do not have good emotional support while the picture is almost reversed among Saudi mothers as 61.3% of them reported the presence of good emotional support.

Table (3): Percentage Distribution ofSex, Age/Gestational age, and Causes Od Admission, and Presence of Invasive Device forTreatment Cause Among Egyptian Infants and neonates and Saudi neonates:

Item	Egyptian Infants and neonates		Saudi Infants and Neonates	
	No.	%	No.	%
Sex:				
- Male	66	66	128	51.4
- Female	34	34	121	48.6
Age:				

- Birth-1year -1-2 years Gestational Age: - Full term - Preterm	70 30 - -	70 30 - -	- - 162 87	- - 65 35
Causes of Admission: - Medical problems - Surgical problems -Both	 67 33 0	 67 33 0	 232 5 12	 93.1 2 4.9
Presence of Invasive Device: - Yes - No	 100 000	 100 000	 249 000	 100 000

Table (3) demonstrated that near two thirds (66%) of Egyptian infants and neonates were male while (51.4%) of Saudi neonates were male. Majority (70%) of Egyptian infants and neonates aged between birth and one year while more than two thirds (65%) of Saudi neonates were full term babies. More than two thirds (67%) of Egyptian infants admitted because of medical diagnosis while 33% had surgical diagnosis.Majority of the Saudi neonates (93.1%), was admitted because of medical diagnosis, 2 % had surgical diagnosis and 4.9% had both medical and surgical problems. All infants and neonates in both samples (Egypt and Saudi Arabia) experienced invasive procedures for therapeutic causes.

Table (4): Overall Maternal Stress Level Among Egyptian and Saudi Mothers Expressed in Mean and Standard Deviation

Domains	Number of items	Mean ± SD of Egyptian Mothers (n= 100)	Mean ± SD of Saudi Mothers (n=249)
Sights and sounds of the environment	5	0.99±0.43	1.88±0.99
Infant's appearance	14	0.98±0.45	1.94±0.98
Parental role alterations	7	1.23±0.61	2.47±1.43
Total	26	1.07±0.48	2.07±0.94

Scoring System: 1=minimum and 5=maximum

Table (4) shows that overall stress engendered by the PICU and NICU environment for the Egyptian and Saudi mothers, was little (Egyptian mothers) and little to moderately stressful (Saudi mothers), with highest stress experienced in relation to parental role alterations (Mean ± SD = 1.23±0.61 and 2.47±1.43) respectively. Sights and sounds of the PICU and NICU environment and infant appearance posed lesser stress among Egyptian and Saudi mothers (Mean ± SD = 0.99±0.43 and 0.99±0.43) respectively.

Table (5): **Nurses 'Support as Perceived by Egyptian and Saudi Mothers Expressed in Mean and Standard Deviation.**

Domains	Number of Items	Mean ± SD of Egyptian Mothers (n= 100)	Mean ± SD of Saudi Mothers (n=249)
Emotional support	3	1.81±0.03	3.88±1.03
Informational support	9	1.98±0.99	3.82±0.99
Appraisal/Esteem Support	4	1.27±0.06	3.77±1.06
Instrumental Support	5	1.05±0.81	4.25±0.81
Overall Support	21	1.92±0.86	3.92±0.86

Regarding the Nurses support as perceived by Egyptian and Saudi mothers of PICU infants and neonates and NICU neonates it was apparent from table (5) that generally the Saudi mothers perceived nursing support better than Egyptian mothers (over all support mean ± SD = 1.92±0.86 and 3.92±0.86) respectively. The highest level of perceived nursing support was in the area of information for Egyptian mothers and the area of instrumental support for Saudi mothers (mean ± SD =1.98±0.99, and3.88±1.03) respectively. While the least area of support for Egyptian mothers was instrumental support while for Saudi mothers was appraisal/esteem support (mean ± SD = 1.05±0.81 and 3.77±1.06) respectively.

Table (6): Relationship Between Overall Maternal Stress Level and Perceived Nurses' Support Among Egyptian and Saudi Mothers:

Item	Perceived Nurses' Support by Egyptian mothers (n=100)		Perceived Nurses' Support by Saudi mothers (n=249)	
Overall maternal stress	R	p. value	r	P. value
	-1.02	0.000	-0.373	<0.01

Over all maternal stress had a strong statistically significant negative correlation with perceived nurses' support among Egyptian mothers while it has a week statistically negativecorrelation among the Saudi mothers ($r= -1.02$, $p<0.000$ and $r=-0.373$, $p<0.01$) respectively. Maternal stress was higher when provider support was perceived to be less.

IV. Discussion

The overall stress levels of the mothers in the present study was low (Egyptian mothers, mean = 1.07±0.48) to mild (Saudi mothers2.07±0.94), this finding is similar to the findings of Ashwani, Rekha, and Kumar, (2017)[14] from India; Iranmanesh, Hosseini, Rayyani, Razban, and Pooraboli, (2014)[6] from Iran; Turner, Chur-Hansen, Winefield and Stanners, (2015)[5] from Australia which reported mean stress in NICUS to be (1.46-2.44, 2.72, and 2.96) respectively. However, the mean stress identified among mothers in the current setting was markedly lower than the reports of Agrawal and Gaur, (2016)[3], Shanmugam&Ramachandra, (2015)[15] and Anish, Varghese, Sohi, and Singh(2015)[16] from India; and Musabiremia, Bryslewicz, andChipps, (2015)[17] from Rwanda. These differences perhaps may be due to dissimilarities in the sample, setting or tools used for collecting the data.

Our study reported stress level is lower than those of Wright, McCoy and Meadow (2015)[18]probable because the study focused on a specific group (ventilated babies) which was different from the findings of the current study, with a more general sample. However; Egyptian mean overall maternal stress level was lower than Saudi mothers, this can be explained on the light of the socio-demographic data of the Egyptian mothers as they acquainted to more difficult life than Saudi mothers as they work and do not have the cars, drivers and such facilities so they are more tolerant to high stress levels.

Parental role alterations produced maximum stress for the mothers probably because they were separated from theinfants and was not able to be involved in care as in normal situations (Table 4). Several previous studies over the past decade from different regions of the world, had also reported the same findings[3,19,20,14]. Sights and sounds in the NICU environment and appearance and behaviour of the infant created only a little stress among mothers; this finding might be due to frequent visits to the ICU would have enabled them to familiarize and adapt with the environment, reducing the stress felt.

Contradicting findings regarding perception of nurse's support was noticed as Saudi mothers perceived nurses' support to be high, especially in instrumental support/ perceived quality of care subscale, with highest mean values. While Egyptian mothers had a totally opposing perception. For the difference between the perception of nurses' support between Egyptian mothers and Saudi mothers this is totally understood on the light of the fact that nurses in the two countries are different in background, nationality, training and also the nurse patient ratio is higher among the Egyptian nurses.

However; data from table (5) brings to light that nurses' need to improve support pertaining to the provision of information about the neonate, instrumental support as well as in identifying the feelings and concerns of the mothers and support them emotionally. These findings matches those of other studies[8,21,6].

Mothers perceived least support in parental esteem/ appraisal as well as instrumental support. Alteration in parental role was the domain in which highest stress was experienced .Iranmanesh, Hosseini, Rayyani, Razban and Pooraboli (2014)[6]; also reported consistent findings. Results from a study in NICUs of Jeddah also revealed that most parents (53.51%) were unsatisfied about nursing support and experienced higher stress levels[8]. AlbdulAziz, Moss, and Copnell (2017)[10] reported that nurses believed in and acknowledged importance of family-centered care; but, struggled practicing the model in the everyday work due to language barriers, communication issues, cultural issues and hospital policies. These issues are relevant in Saudi mothers.

On the other hand, Egyptian mothers overall maternal stress level was more strongly negative correlated to perceived nurses support than Saudi mothers, that might be explained by the fact that factors related to nurses in the two countries greatly varied as (nationality, training, number of patients assigned to each nurse, salary, working hours).

V. Conclusion

Egyptian as well as Saudi mothers experienced stress related to admission of the infants and neonate to PICU and NICU, with maximum stress occurring due to parental role alterations. Improving support for parents could help to minimize stress experienced by them. The quality of nurse's support was perceived by Egyptian mothers as minimal and by Saudi mothers as good. A negative relationship was found between the overall maternal stress and perceived nurses' support in both samples showing that the lesser the nurses' support the greater the maternal stress experienced.

VI. Recommendations

On the light of the current study the following is recommended:

- Measures need to be taken in the units in order to improve emotional, informational, instrumental and esteem support for the mothers.
- Clinical condition of the baby has to be explained with rationales of treatment provided, in more detail, during each visit.
- Mothers should be taught, encouraged and supported to participate more, in the care of neonates, thereby empower them in the parental role.
-Noise levels of the ICU need to be minimized and mothers have to be familiarized regarding the equipment and environment of the NICU.
- Since health care provider support helps to reduce maternal stress, incorporating teaching strategies that minimize parental stress could facilitate a smoother transition and help mothers to become competent with the parental role.

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