



Assessment of physical problems, psychological stress and social problems perceived by mothers of hospitalized neonates, in SNCU of a selected hospital, West Bengal

Debarpita Mukherjee

Assistant Professor, Department of Pediatrics, Sai Nath Nursing College, Sai Nath University, Ranchi, Jharkhand, India

Abstract

A descriptive survey was conducted on assessment of physical problems, psychological stress and social problems perceived by mothers of hospitalized neonates, in SNCU of a selected hospital, West Bengal. The objectives of the study were to find out the physical problems, perceived psychological stress and social problems of mothers of hospitalized neonates admitted in SNCU and to determine association between physical problems, psychological stress and social problems with selected socio-demographic variables. The conceptual framework of Conservation Theory of Myra Levine was used and descriptive survey design was adopted. Study was conducted among 120 purposively selected mothers of newborn babies admitted in SNCU of Asansol District Hospital. Structured Interview Schedule was prepared to collect the data of demographic characteristics, physical problems and social problems of mother; Record analysis for demographic data of the Newborn and modified PSS: NICU for assessment of psychological problems. The findings of the study were: major (22.02%) problem was breast engorgement, 16.30% was fatigue. Among the mothers, 50% had moderate stress, 43.33% had severe stress and 6.67% mothers had mild stress. Total 93.33% of the mothers had Financial Problems, 57.71% had problem regarding Religious Belief and Superstitions, 27.17% had problem in Activity Performance, 5.56% mothers had problem in Family Support and 5.28% mothers had social problem in communication and there was no significant association between physical problems, psychological stress and social problems with selected socio-demographic variables. It is concluded that mothers of hospitalized neonates experience physical problems, psychological stress and social problems. The study has implications in the field of nursing practice, nursing education, nursing administration and nursing research. A similar study can be conducted on a larger scale sampling by randomization in a different setting for generalization.

Keywords: Hospitalized neonates, mothers, physical problem, psychological stress, social problem

Introduction

The birth of a newborn brings happiness in family. Birth of a healthy baby is expected during the pregnancy period. The first cry of newborn baby brings joy and relief to mother. To facilitate the bonding between the baby and mother, both of them are kept together. But soon after birth if the baby becomes sick, the bonding becomes interrupted. It makes the mother and baby anxious. If the newborn becomes sick and hospitalized, the family integrity gets disrupted, family bonding gets loosened. So, if child is sick, the lifestyle of the mother no more remains normal.

The environment of the SNCU may appear stressful to the non-medical person. There is the movement of a large number of unfamiliar medical personnel, the continuous noise of alarms, characteristic smells of medicine, surface disinfectant and the instruments surrounding the child makes her anxious. In the first week of the hospitalization of their child in the SNCU, uncertainty health of the child creates a situational crisis for mother. Mothers experience depression and anxiety for ambiguity about her parental role, an uncertain prognosis of newborn and ineffective communication with medical personnel. Parents often feel helpless and blame themselves for the sickness. Mothers feel guilty for the inability to take care of other family members. The lack of communication with spouse strains the marriage. Sometimes hospitalization of the baby ends in separation of parents.

Approximately, 10% of infants are born prematurely and admitted into the Neonatal Intensive Care Unit (NICU), with additional infants being admitted for other reasons

(e.g., sickness, low birth weight, etc.) (March of Dimes, 2015).

Due to hospitalization, the mother becomes often sick. Sleep disturbances is very common among them. Mothers of hospitalized neonates experience various problems including physical, psychological and social. Insomnia, breast engorgement, loss of appetite, constipation, extreme tiredness are very common. It mentions almost 55.05% mothers were suffering from sleep disturbances. Physical and psychological issues may arise when the mother spends long hours at hospital, taking care of the child. Eiser JR, Eiser CJ, Mayhew AG, Gibson AT. found that behavioural-mood problems and quality of life of mothers of hospitalized newborns was not good. Mothers of preterm infants had more deteriorated physical health and behavioral difficulties than mothers of full-term infants.

Ghosh A in her survey found that 10.77% mothers blamed themselves for illness of baby, superstition present for 18.97% of mothers, 67.18% mothers had financial problems. 45.13% mothers experienced moderate stress due to child's admission to NICU. A statistically significant relationship was found between social problems and emotional stress ($r = 0.201$).

If the mother has another offspring staying at home, she feels guilty for her inability to take care of that child. Pending household chores, staying at hospital away from family makes her feel of getting isolated.

Family support is very important to continue the treatment of the baby, as of the family gets over burdened by the expenses of treatment. Proper communication, ventilation of

feelings helps the parents to cope with the situational crisis. It was found that the social pressure is higher among those who don't get adequate family support.

Material and methods

Research approach

The research approach used for this is Survey approach.

Research design

The design selected for this study is descriptive survey design.

Sample

Sample is the representative of the population selected for the study. In this study, samples are the mothers of neonates admitted in S.N.C.U, Asansol District Hospital, West Bengal.

Sample size

The final study was conducted on 120 mothers.

Sampling technique

Non probability purposive sampling technique was used in this study.

Data collection tools and techniques

Table 1: Data collection tools and techniques

Tool No.	Variables	Name of the Tools	Techniques
Tool I	Demographic data	Structured Interview Schedule	Interviewing
Tool II	Demographic data	Record analysis	Recording
Tool III	Physical problems	Structured Interview Schedule	Interviewing
Tool IV	Psychological Stress	Modified PSS: NICU Scale	Interviewing
Tool V	Social problems	Structured Interview Schedule	Interviewing

Data collection procedure

The final study data collection was done from 04.01.2021 to 31.01.2021.

- From admission register of SNCU, a list of the babies meeting the sampling criteria was prepared.
- From the list, samples are selected through non probability purposive sampling technique.
- Self introduction was given to the samples to build interpersonal relationship and rapport.
- Explanation was given regarding the study and its objectives.
- The terms of anonymity and confidentiality was addressed.
- Informed Consent was received from the samples.
- Separate code number was given to each participant.
- Participants were taken to a separate room for privacy and data was collected by interviewing the subjects and analyzing records.
- Record analysis was done from Bed Head Tickets (BHT).
- For Record Analysis, it took 5min for each sample.
- Interviewing each participant took 25mins on average.
- After interviewing, each participant was thanked for their kind cooperation.

Organization of the study findings

Section I

Part A: Findings related to demographic characteristics of the respondents

Data presented in Table 2 shows that majority (65.83 %) of mothers belonged to age group of 20- 29 yrs., 25 % were of below 20years age group and 9.17% mothers belonged to age group of 30-39yrs age group. It shows that majority (85%) of the mothers were Hindu, 14.17% of the mothers were Muslim and 0.83% of the mothers were belonging from other religion. It also shows that all the mothers were married. Majority (50.83%) of the mothers had secondary education. 23.33% of the mothers were illiterate, 11.67% mothers had the primary education, 7.50% mothers had higher secondary education and 6.67% mothers had graduation and higher education. Most (84.17%) of the mothers were housewife. 9.17% of the mothers were labour, 4.16% mothers were self-employed and 2.50% mothers' occupation was service. Most (73.33%) of the mothers' monthly family income was Rs.5000 – Rs.10,000. 14.17% of the mothers belonged from the family of monthly income below Rs.5000, 7.50% mothers were having monthly family income above Rs.15,001 and 5.0% mothers were from the group of Rs. 10,001 – Rs. 15,000. Majority (55.83%) of the mothers had 05-10 members in their family, 40.83% mothers had below 5 family members and 3.34% of the mothers had more than 10members in family.

Part B: Findings related to characters of new born babies

Data presented in Figure 1 depicts that majority (54.17%) of the babies were born Preterm, 45% were term babies, 0.83% babies were born Post term.

Section II: Findings regarding physical problems of respondents

Figure 2 shows from overall physical problem, major (22.02%) problem was breast engorgement, 16.30% was fatigue, 14.54% was insomnia, 12.78% was constipation, 10.35% fever, 8.37% headache, dizziness 5.07%, 4.41% loss of appetite, 2.20% palpitation, 2.20% nausea, 1.10% heartburn, 0.66% vomiting.

Section III: Findings related to psychological stress of respondents

Pie diagram in Figure 3 shows majority (50%) of mothers had moderate stress, 43.33% had severe stress and 6.67% mothers had mild stress. Bar diagram in Figure 4 depicts that majority (90.83%) of mothers had severe stress for Parental Role Alteration, 59.17% had moderate stress for New born's Appearance.23.33% mothers had severe stress and 17.50% had mild stress for New born's Appearance. 8.33% mothers had moderate stress and 0.84% mothers had mild stress for Parental Role Alteration.

Section IV: Findings regarding social problems of respondents

Figure 4 shows that majority (93.33%) of the mothers had Financial Problems, 57.71% had problem regarding Religious Belief and Superstitions, 27.17% had problem in Activity, 5.56% mothers had problem in Family Support and 5.28% mothers had social problem in communication. Table 3 depicts that majority (7.50%) mothers had problem in maintaining good communication with in laws. 4.17% of

the mothers were not maintaining good communication with husband as well as with paternal family. Majority (8.33%) mothers had problem as they were not getting support from their in laws. 4.17% of the mothers were not getting support from husband as well as paternal family. Religious activity of majority (93.33%) got hampered due to hospitalization of the new born. 68.33% of the mothers wanted to seek help from other belief systems like Tantrik Ojha. 50% of the mothers blamed themselves and 19.17% of the family members blamed the mother for hospitalization of the new born. Majority (95%) of the mothers are facing financial burden. Among the mothers, 94.17% were facing financial loss for hospital stay, 93.33% were facing financial loss for transportation and 90.83% mothers were feeling insecure about the job of their own of their spouse. Most (83.33%) of the mothers were unable to perform their activities of daily living, 18.33% mother’s Household Activities were getting hampered, 10% were getting socially isolated and 9.17% of the mothers were not getting sufficient ‘me time’ for themselves.

Section V: Description of association between physical problems, psychological stress and social problems with selected socio demographic variables

There is no association between physical problems, psychological stress and social problems with selected socio demographic variables [df=1(3.84) p>0.05]

Conclusion

Though advancement in medical treatment has resulted in reduction of morbidity and mortality, yet thousands of babies get admitted in SNCU every year. The hospitalization of newborn is a traumatic event for both the parents. Mothers of hospitalized neonates very often experience different kind of problems in every aspect-physical, psychological as well as social. Physical problems like breast engorgement, insomnia, headache, palpitation, nausea, vomiting etc. are very common. Mothers gets vulnerable and often experiences social problems like inability to perform the parental role, sick appearance of baby, environment of the unknown setting of the hospital cause to precipitate psychological stress in her. Inability to perform daily activities of living, interrupted religious

activity, financial burden, inadequate support from family, lack of communication and many others. So proper counselling should be done, emotional support to be given by nurses. Assessment and proper treatment facility should be available for the mothers of hospitalized neonates, as health is a right for all.

Tables and diagrams

Table 2: Findings related to demographic characteristics of the respondents

Demographic Characteristics	Frequency	Percentage (%)
Age (in years)		
<20	30	25
20 - 29	79	65.83
30 - 39	11	9.17
Religion		
Hindu	102	85
Muslim	17	14.17
Others	1	0.83
Marital Status		
Married	120	100
Unmarried	0	Nil
Separated	0	Nil
Education	28	23.33%
Illiterate	14	11.67%
Primary	61	50.83%
Secondary	9	7.50%
Higher Secondary	8	6.67%
Graduation and higher education	28	23.33%
Occupation		
Housewife	101	84%
Business	0	0%
Labour	11	9%
Self employed	5	4%
Service	3	3%
Monthly Family Income		
Below Rs.5,000	17	14%
Rs.5,000 - Rs.10,000	88	73%
Rs. 10,001 - Rs. 15000	6	5%
Above Rs. 15,001	9	8%
Total Family Members		
Below 5 members	49	41%
05-10 members	67	56%
Above 10 members	4	3%

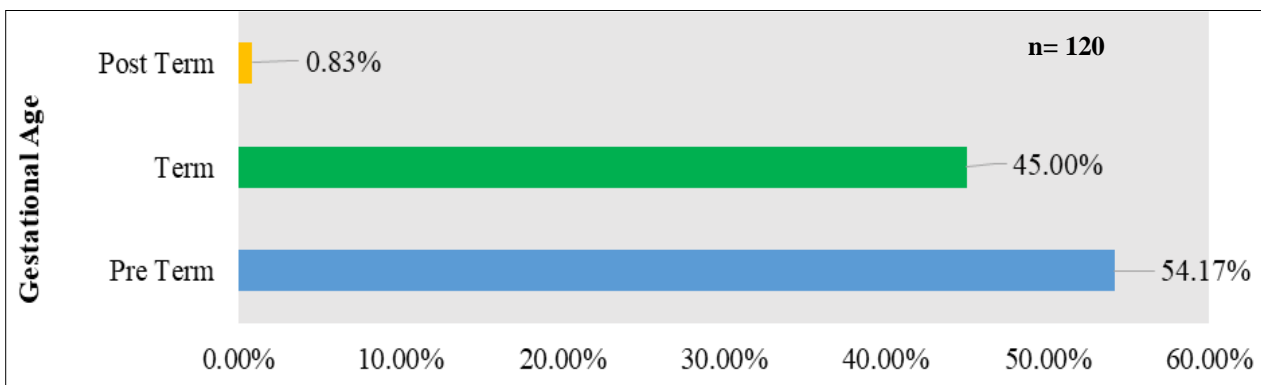


Fig 1: Bar diagram showing percentage distribution of gestational age of newborn babies

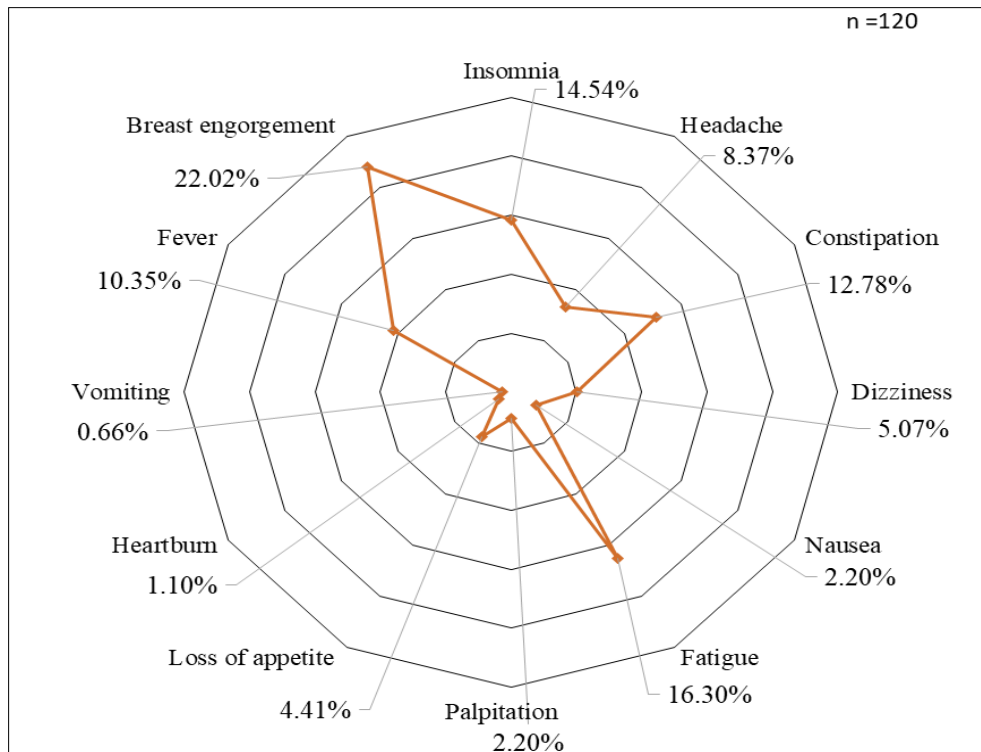


Fig 2: Radar diagram showing percentage distribution of different physical problems from overall physical problems of respondents

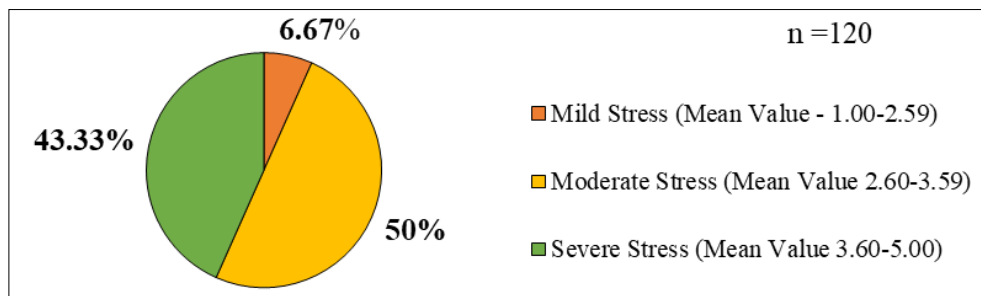


Fig 3: Pie diagram showing percentage distribution of overall psychological stress of respondents

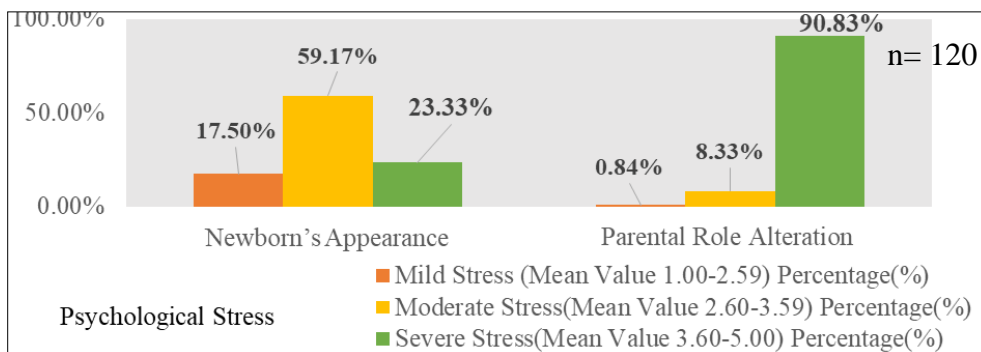


Fig 4: Bar diagram showing percentage distribution of psychological stress of respondents according to factors

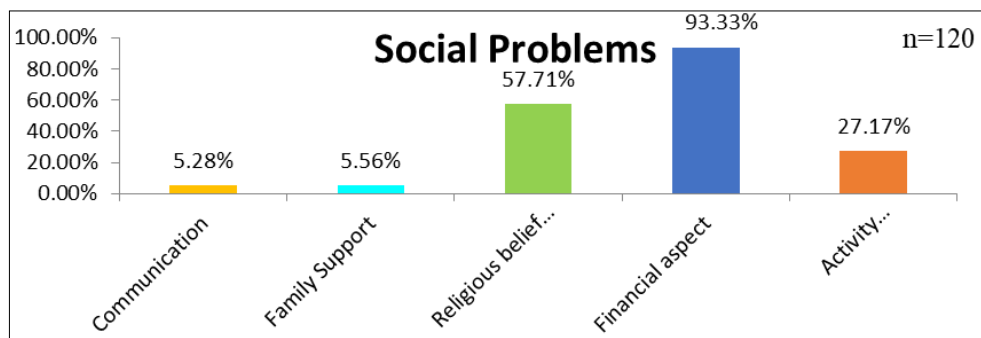


Fig 5: Bar diagram showing percentage distribution of overall social problems in different aspects of respondents

Table 3: Findings related to social problems of the respondents

Social Problems	Frequency	Percentage (%)
Communication		
Paternal family	5	4.17%
In laws	9	7.50%
Husband	5	4.17%
Family Support		
In laws	10	8.33%
Paternal family	5	4%
Husband	5	4.17%
Religious belief and superstitions		
Family blame	23	19.17%
Seek help from 'tantrik, ojha'	82	68.33%
Self-blame	60	50%
Hampered religious activity	112	93.33%
Financial aspect		
Financial burden	114	95.00%
Job insecurity	109	90.83%
Financial loss for hospital stay	113	94.17%
Financial loss for transportation	112	93.33%
Activity Performance		
No 'Me Time	11	9.17%
Social Isolation	12	10.00%
Hampered household activity	22	18.33%
Interrupted bonding	18	15.00%
Hampered activities of daily living	100	83.33%

References

- Sharma S. Nursing Research & Statistics. 2nd ed. New Delhi: Elsevier India Pvt Ltd, 2015.
- Basavanthappa BT. Nursing Research. 2nd ed. New Delhi: Jaypee Brothers Medical Publisher (P) Ltd, 2007.
- Datta P. Pediatric Nursing. 3rd ed. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd, 2014.
- Kurian S. Textbook of Pediatric Nursing. 1st ed. Bangalore: EMMESS Medical Publishers, 2016.
- Marlow DR, Redding BA. Marlow's Textbook of PEDIATRIC NURSING. 6th ed. New Delhi: Elsevier India Pvt Ltd, 2017.
- Pal P. Textbook of Pediatric Nursing. 1st ed. Hyderabad: Paras Medical Publishers, 2016.
- Wong. Essentials of Pediatric Nursing. 7th ed. New Delhi: Mosby publication, 2005.
- Padmaja A. The Textbook of Child Health Nursing. 1st ed. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd, 2016.
- Soni S. Text book of Advanced Nursing Practice 1st ed. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd, 2013.
- Sarkar S. Pediatric Nursing. 1st ed. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd, 2018.
- Mandal S. A Study on Clinical Profile and Outcome of Sick Neonates in a District Level SNCU. Journal of evidence based Medicine and Health Care [internet], 2020;7(1):29-33. Available From https://jebmh.com/latest_articles/989722
- Ivashchuk A, Guillen U, Mackley A, *et al.* Parental protective factors and stress in NICU mothers and fathers. Journal of Perinatology [internet], 2020. Available from <https://doi.org/10.1038/s41372-020-00908-4>
- Feeley N, Robins S, Genest C, *et al.* A comparative study of mothers of infants hospitalized in an open ward neonatal intensive care unit and a combined pod and single-family room design. BMC Pediatrics [internet], 2020, 20(38). Available from <https://doi.org/10.1186/s12887-020-1929-1>
- Adams SY, Tucker R, Clark MA, *et al.* "Quality of life": parent and neonatologist perspectives. Journal of Perinatology [internet], 2020;40:1809-1820. Available from <https://doi.org/10.1038/s41372-020-0654-9>
- Ghosh A. A study to find out the physical, social problems & emotional stress experienced by the mothers of babies admitted in NICU / SNCU of selected Government hospital of Kolkata, West Bengal. 2nd Regional Conference of Society Of Midwives India. March 14-15; Sagore Dutta Hospital, Kolkata, 2020, 46.
- Loewenstein K. The Experiences of Parents in the Neonatal Intensive Care Unit. The Journal of Perinatal & Neonatal Nursing [internet], 2019;33(4):340-349. Available from https://journals.lww.com/jpnnjournal/Abstract/2019/10000/The_Experiences_of_Parents_in_the_Neonatal.12.aspx
- Ong Leong S, Abdullah Lim K, Danaee M, Soh Lam K, Soh Goek K, Japar S. Stress and anxiety among mothers of premature infants in a Malaysian neonatal intensive care unit. Journal of Infant Psychology [internet], [cited 2018 Nov 27] 2019, 37(2). Available from <https://tandfonline.com/doi/full/10.1080/02646838.2018.1540861>
- Basnet S. Factors associated with stress among mothers of hospitalized children admitted through emergency department. Journal of Patan Academy of Health Sciences [internet]. [cited 2019 May 25], 2019;6(1):61-65. Available from <https://jpahs.edu.np/index.php/jpahs/article/view/255>
- Dhungana M, Kachapati A. Maternal Stress Of Hospitalized Children In A Hospital Of Rupandehi, Nepal. Journal of Psychiatrists' Association of Nepal [internet], [cited 2018] 2018, 7(1). Available from <https://www.nepjol.info/index.php/JPAN/article/view/22937>
- Lima E. Parental Quality of Life Among Parents in the NICU: Examining Moderators of Change Over Time. Philosophy in Clinical Psychology [internet]. Loma Linda University Electronic Theses, Dissertations & Projects 432, 2017. Available from: <https://scholarsrepository.llu.edu/etd/432>
- Prasanna KV. Assess the parental stress among mothers of neonates admitted in NICU. International Journal of Applied Research [internet], 2017;3(10):167-168. Available from <https://www.allresearchjournal.com/archives/?year=2017&vol=3&issue=10&part=C&ArticleId=4485>
- Palma E, Von Wussow F, Morales I, Cifuentes J, Ambiado S. Stress in parents of newborns hospitalized in a neonatal intensive care unit. Revista Chilena de

- Pediatría[internet],2017;88(3):332-9. Available from <http://dx.doi.org/10.4067/S0370-41062017000300004>
23. Baía I, Amorim M, Silva S, Kelly-Irving M, Freitas C, Alves E. Parenting very preterm infants and stress in Neonatal Intensive Care Units. *Early Human Development* [internet], ISSN 0378-3782,2016;(101):3-9. Available from: <https://doi.org/10.1016/j.earlhumdev.2016.04.001>
 24. Wormald F, José L, Torres G, Cánepa P, González M, Rodríguez D, *et al.* Stress in parents of very low birth weight preterm infants hospitalized in neonatal intensive care units. A multicenter study. *Arch Argent Pediatrics*[internet],2015;113(4):303-309. Available from:<https://www.sap.org.ar/docs/publicaciones/archivosarg/2015/v113n4a04e.pdf>
 25. Sayed H, Mohammed E. Stress Among Mothers of Hospitalized Children at Qena Governorate. *Assiut Scientific Nursing Journal* [internet], [2014 December] 2014, 2(4). Available from https://www.researchgate.net/publication/330684407_Stress_Among_Mothers_of_Hospitalized_Children_at_Qena_Governorate
 26. Shelton S, Dana M Meaney D, Margie H, Shih-Yu L. Depressive symptoms and the relationship of stress, sleep, and well-being among NICU mothers. *Journal of Nursing Education and Practice*.[internet],2014;4:70-79. Available from: <https://10.5430/jnep.v4n8p70>
 27. Shajahan A. A study to assess the level of stress among parents of under five children who got admitted for treatment in selected hospitals at Bangalore. *Goldfinch College of Nursing:Rajiv Gandhi University of Health Sciences, Karnataka, 2013.* Available from: <https://52.172.27.147/bitstream>
 28. Kynø NM, Ravn IH, Lindemann R, *et al.* Parents of preterm-born children; sources of stress and worry and experiences with an early intervention programme – a qualitative study. *BMC Nursing* [internet], 2013, 28(12). Available from <https://doi.org/10.1186/1472-6955-12-28>
 29. Ravn IH. Lindemann R. Smeby NA. Bunch EH. Sandvik L. Smith L. Stress in fathers of moderately and late preterm infants: a randomised controlled trial. *Early Child Development and Care* [internet],2012, 182(5). Available from <https://doi.org/10.1080/03004430.2011.564279>
 30. Hasan Tehrani T, Haghghi M, Bazmamoun H. Effects of Stress on Mothers of Hospitalized Children in a Hospital in Iran. *Iran J Child Neurology Autumn* [internet],2012;6(4):39-45. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3943023>
 31. Sikorova L, Kucova J. The needs of mothers to newborns hospitalised in intensive care units. *Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub* [internet],2012;156(4):330-336. Available from (PDF) <https://www.researchgate.net> The needs of mothers to newborns hospitalised in intensive care units (researchgate.net)
 32. Chourasia N, Surianarayanan P, Adhisivam B, Bhat V. NICU Admissions and Maternal Stress Levels. *The Indian Journal of Pediatrics* [internet],2012L80(2013):380-384. Available from: <https://doi.org/10.1007/s12098-012-0921-7>
 33. Mackley Amy B, Joseph R. Forgotten Parent NICU Paternal Emotional Response. *Advances in Neonatal Care* [internet],2010;10(4):200-203. Available from https://journals.lww.com/advancesinneonatalcare/Abstract/2010/08000/Forgotten_Parent__NICU_Paternal_Emotional_Response.10.aspx
 34. Yurdakul Z, Akman I, Kemal KM, Karabekiroglu A, Yaylalı G, Demir F. Maternal Psychological Problems Associated with Neonatal Intensive Care Admission. *International Journal of Pediatrics* [internet]. 2009 Jun 08 [cited 2009], 2009, 1-7. Available from https://www.researchgate.net/publication/40812766_Maternal_Psychological_Problems_Associated_with_Neonatal_Intensive_Care_Admission
 35. Szczapa T, Gadzinowska JS, Jopek A. Evaluation of stress responses in parents of newborns hospitalized in the Intensive Care Unit. *Ginekologia Polska* [internet], 2009, 80(5). Available from https://journals.viamedica.pl/ginekologia_polska/article/view/46613
 36. Miedema B, Easley J, Fortin P, Mathews M, Hamilton R. The economic impact on families when a child is diagnosed with cancer. *Current Oncology* [internet],2008;15(4):173-178. Available from https://www.researchgate.net/publication/23234046_The_Economic_Impact_on_Families_When_a_Child_is_Diagnosed_with_Cancer
 37. Tilly R, Ros B, Nicola B, Weindling AM. A new stressor scale for parents experiencing neonatal intensive care: the NUPS (Neonatal Unit Parental Stress) scale. *Journal of Reproductive and Infant Psychology* [internet],2007;25(1):66-82. Available from:<https://www.researchgate.net/publication/262950536>
 38. Franck LS. Measuring neonatal intensive care unit-related parental stress. *Wiley online library* [internet],2005;49(6):608-615. Available From <https://doi.org/10.1111/j.1365-2648.2004.03336.x>
 39. Eiser JR, Eiser C, Mayhew AG J, Gibson AT. Parenting the premature infant: Balancing vulnerability and quality of life. *Journal of child psychology and psychiatry, and allied disciplines* [internet],2005;46(11):1169-77. Available from [Parenting the premature infant: Balancing vulnerability and quality of life | Request PDF \(researchgate.net\)](https://www.researchgate.net/publication/262950536)
 40. Sato C. Social and Behavioral Aspect of Mother's Health Behaviors and Neonatal Health: Risk Factor Analysis of Neonatal Septicemia in Urban Slums of Muntinlupa, Philippines. [Master of Public Health]University of South Florida Department of Environmental and Occupational, Health College of Public Health University of South Florida, 2004.

- Available from:
<https://scholarcommons.usf.edu/etd/2972>
41. Rautava P, Lehtonen L, Helenius H, Sillanpää M. Effect of newborn hospitalization on family and child behavior: a 12-year follow-up study. *Pediatrics, Official Academy Of Journal of Pediatrics* [internet],2003;111(2):277-283. Available from: <https://doi.org/10.1542/peds.111.2.277>
 42. Miles MS, Funk GS, Carlson J, Parental Stressor Scale: neonatal intensive care unit. *Nursing research* [internet],1993;42(3):148-152. Available from <https://pubmed.ncbi.nlm.nih.gov/8506163/>
 43. Wallinga CR. Child hospitalization: the effects on well siblings and parents. *Lowa State University State Depository* [internet], 1984, 61-65. Available from <https://lib.dr.iastate.edu/rtd/7738>
 44. UNICEF [Internet]. Unicef.org. [cited 2021 Jul 28]. Available from: <https://www.unicef.org>
 45. Home of JAMA and the Specialty Journals of the American medical association [Internet]. Jamanetwork.com. [cited 2021 Jul 28]. Available from: <https://jamanetwork.com>
 46. India Number of births, 1950-2020 - knoema.com [Internet]. Knoema.com. [cited 2021 Jul28]. Available from: <https://knoema.com/atlas/India/topics/Demographics/Fertility/Number-of-births>
 47. India Infant Mortality Rate 1950-2021 [Internet]. Macrotrends.net. [cited 2021 Jul 28]. Available from: <https://www.macrotrends.net/countries/IND/india/infant-mortality-rate>
 48. India Neonatal mortality rate, 1960-2020 - knoema.com [Internet]. Knoema.com. [cited 2021 Jul 28]. Available from: <https://knoema.com/atlas/India/Neonatal-mortality-rate>