Original Article

Anxiety determinants in mothers of children with congenital heart diseases undergoing cardiac surgery

Ali Akbar Rahimianfar, Seyed Khalil Forouzannia, Mohammadtaghi Sarebanhassanabadi, Hamide Dehghani[1], Syedeh Mahdieh Namayandeh, Zohre Khavary[1], Fatemeh Rahimianfar[2], Hamid Aghbageri[3]

Department of Cardiac Surgery, Yazd Cardiovascular Research Center, [1]Faculty Member of Nursing, School of Nursing and Midwifery, [2]Student of Medicine, [3]Department of English Language and School of Medicine, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

Abstract

Background: The infants with congenital cardiovascular diseases are faced with too much problems in the case of their ongoing life. Mothers' stress investigation would be important because can receive the stress from his parents. The aim of the following study was determined anxiety in mothers of children undergoing cardiac surgery.

Materials and Methods: The present study was conducted by an analytical study on 69 infants' mothers who were operated due to their cardiovascular abnormalities in Yazd Afshar Hospital (2012). In this study, some demographic information and influential factors were recorded germane to mothers' stress, including residential location, history of infant hospitalization or congenital disease as well as some questions in the case of stimuli of the hospital environment, family support, economic situation and the mothers' awareness of their stress.

Results: There are statistically significant differences between mothers' stress and their age ($P = 0.03$) and infants' age ($P < 0.0001$). There are not statically significant differences between mothers' stress score mean and their educational level ($P = 0.75$), the infants' hospitalization history ($P = 0.57$), the history of congenital of disease in family ($P = 0.24$) and the family support in infant care ($P = 0.08$).

Conclusion: Those mothers who asserted the stimuli of the hospital environment, infant and its mother support, economic situation and the mothers' awareness lack of disease and infant status as strong stress-making stimuli enjoy a stress high mean.

Key Words: Congenital cardiovascular diseases, hospitalization, mothers' stress

Address for correspondence:
Dr. Zohre Khavary, School of Nursing and Midwifery, Shahid Sadoughi University of Medical Sciences, Yazd, Iran. E-mail: khavaryz394@gmail.com
Received: 08.07.2013, **Accepted:** 08.01.2014

INTRODUCTION

Approximately, 2-3% of newborn infants suffer from the congenital abnormalities life threatening if they not cured.[1] One of the abnormalities is congenital cardiovascular diseases in which it is the most common congenital irregularity and almost 0.8% of newborn infants suffering from these malfunctions.[2] These infants are faced with many problems, including operational interventions, long-term hospitalization and confidence lack of future life in which all the mentioned problems lead to parents' stress and confidence lack.[1,3] Although operational treatments result in life expectancy and survival up to 85%,[4,5] these treatments impose myriad stress upon infants

Access this article online	
Quick Response Code:	Website: www.advbiores.net
	DOI: 10.4103/2277-9175.170680

How to cite this article: Rahimianfar AA, Forouzannia SK, Sarebanhassanabadi M, Dehghani H, Namayandeh SM, Khavary Z, *et al.* Anxiety determinants in mothers of children with congenital heart diseases undergoing cardiac surgery. Adv Biomed Res 2015;4:255.

and mothers.[6] Parents' stress has too extensive and different effects.[7] In fact, each disturbance in mothers' behavior can lead to a negative effect on infant. The infant hospitalization in heart ward is a too much stress-provoking factor for parents; especially, when an infant is in urgent care need.[8] This stress deteriorates the situation and has a harmful effect on family and influential interventions.[9] Studies have been revealing that stress level is too high before the operation and the stress is higher in mothers comparing to fathers.[10] Furthermore, there are other determinants in the case of parents stress considered in related studies such as infant growth incapability, infant behavioral problems childish conduct infant raising methods and diseases.[11-16] The infant hospitalization due the disturbance of life routine leads to parents stress and undoubtedly, this issue can be stress-provoking for the infant. The mothers' stress investigation is vital due to its effect on the infant who can receive the stress in accordance with his development level. Despite parents' attempts, their stress transforms to infants owing to their role as the most important source of support. Consequently, in the present study, the level and influential factors in making stress for mothers of infants who are in need of heart operation was investigated.

MATERIALS AND METHODS

Present study was conducted by an analytical observation study of infants' mothers who were operated in heart ward of Yazd Afshar Hospital (2012). Sample size were determined as 69 persons and sampling was performed via a convenience sampling method. Inclusion criteria was considered as: Anti-stress medicines, addiction and verbal, aural mothers' abnormalities. Data collected by two questionnaires in which the first one is a standard questionnaire of evident stress by spielberger state trait anxiety inventory and the second one was a researcher-made checklist used to collect the data in the cases of demographic information and influential factors on mothers stress. First part including demographic information (age, mother education and infant age), residential place, infant hospitalization history, congenital disease background in family and the second part including some questions in the case of stimuli of the hospital environment, infant and its mother support, economic situation and the mothers' awareness of their stress.

The questionnaire completion was done by one of the conductors and then the responses were reported. To remove the inter observer variation; all the questionnaires were completed by a unique conductor to achieve the goal of same explanation and questioning-answering procedure. The present study was conducted in Afshar Hospital after the Ethic Committee approval of Heart Center and Shahid Sadoughi University of Medical Sciences.

RESULTS

Mothers' age mean in observed samples was 30.48 ± 8.59 and range (17-49), respectively. Infants' age mean in observed samples was 3.77 ± 4.42, with range (0.8-16), respectively. Nearly 29% of them were native. In the case of mothers' education, the following varieties were observed: 76.7% high school and 23.2% university. In the case of infants' hospitalization background, the following varieties were observed: 34.8% no case, 26.1% 1 time, 30.4% 2 times and 8.7% more than 2 times. The results are presented in Table 1.

The observed samples' stress mean was 50.90 ± 10.80 and the min and max were 26 and 71, respectively. The stress mean of mothers was more than average. The results are presented in Table 2. In the case of the mothers' stress mean and infant's age comparison, the regression results revealed an opposite linear relationship ($P < 0.0001$). There was a statistically significant opposite relationship between mothers' stress mean and mothers' age ($P = 0.03$). In the case of mothers' attitude to environmental stress-making stimuli (ward's noises, hospitalization in unfamiliar ward, the nurses conduct to infants and mothers, the facilities of the room and ward), those mothers who assumed environmental stimuli as debilitative ones enjoyed the stress mean of 59.89 ± 3.9 comparing with 49.14 ± 11 ($P = 0.1$). Regression findings revealed a raise in mothers' attitude in the case of environmental stress-making factors comparing to stress mean among who assumed the environmental stress-making factors more debilitative ($P = 0.058$). Those mothers who considered the economic factors as debilitative ones (hospital expenses, infant's care

Table 1: Frequencies of mother's residential location, infant's hospitalization background, mother's education

Variable	No.	Present
Residential location		
Native	20	29
Non-native	49	71
Mother's education		
High school	53	76.6
University	16	21.7
Infant's hospitalization history		
No case	24	23.2
One time	18	26.1
Two times	21	30.4
More than two times	6	8.7

Table 2: The comparison of mother's stress score mean with stressors

Variables	Stress			
	Regression co	Low	High	*P* value
Environmental stressor	2.71	−0.09	5.51	0.058
Economical stressor	4.31	1.70	6.91	0.002
Awareness about disease	8.20	5.74	10.65	<0.0001
Family support	6.63	0.96	14.23	0.08
Infant's age	−1.11	−1.642	0.581	<0.0001
Mother's age	−0.32	−0.617	−0.024	0.03
Mother's education	−0.42	−3.07	2.23	0.75
Infant's hospitalization history	−0.75	−3.38	1.87	0.57
Congenital diseases background history	−2.80	−7.54	1.92	0.24

expenses) enjoyed the stress mean of 55.36 ± 9.81 comparing with 46.75 ± 9.99, which was statistically significant ($P = 0.007$). Regression findings revealed a raise in mothers' attitude in the case of economic stress-making factors comparing to stress mean among who assumed the economic stress-making factors more debilitative ($P = 0.002$). Those mothers who considered the awareness lack factors as debilitative ones (infant's care after operation awareness, infant's operation result and future life awareness, treatment and care methods awareness) enjoyed the stress mean of 55.36 ± 8.01 comparing to 35.80 ± 5.35 which was statistically significant ($P < 0.0001$). Regression findings revealed a raise in mothers' attitude in the case of awareness lack stress-making factors comparing to stress mean who assumed the awareness lack stress-making factors more debilitative ($P = 0.002$). There were not statistically significant relationship between mothers' stress and their education ($P = 0.75$), infants' hospitalization background ($P = 0.57$), congenital disease background ($P = 0.24$), also family support ($P = 0.08$).

DISCUSSION

In the present study, 69 cases were questioned and demographic data, stress-making reasons of mothers whose infants were operated by heart reported. Findings revealed that mothers' stress mean was 50.90 ± 10.80. It means the stress mean was higher than average. Findings of Linda's study which 211 cases were questioned (mothers whose infants were operated by heart) revealed that mothers' stress before and after the heart operation was higher than average;[17] consequently, two studies findings were in line. In addition, some others studies showed that mothers' stress mean of heart suffering diseases was high.[18-21] Regression findings revealed that there is an opposite linear relationship between mothers' stress and infants' age ($P < 0.0001$), it means mothers' stress of younger infants was higher than others. In sum, other studies could find the same result.[17] It seems younger infants' stimulation is more than others and it issue cause the more stress of mothers. Those mothers who considered the economic factors as debilitative ones (hospital fee and infant's care fee) have the stress mean of almost high ($P < 0.007$). It means economical stimuli lead to stress raise. Other studies showed that economical stimuli result in mothers' stress.[22] Although a study conducted by Elaine in Alberta hospital in the case of mothers' stress of infants suffering from petit mal revealed that there is not any relationship between family variables such as economic status, family type and parent's education level and parents stress.[21] In sum, the mentioned finding was not in line with present study results. Regression findings revealed a raise in mothers' attitude in the case of environmental stress-making factors (ward noises, hospitalization in an unfamiliar environment, facilities of room and ward and the nurses relationship with infants and their mothers) comparing to stress mean who assumed the environmental stress-making factors more debilitative ($P = 0.058$). It means, panicky persons are sensitive to environmental stress-making factors; consequently, it is highly recommended that some explanations should be available in the cases of infants' heart ward, ward environment, instruments, personnel movements, ward equipment, ventilators, room and ward facilities in hospitalization and during visiting.[23] Present study findings revealed that following variables including awareness lack of infant care after operation, awareness lack of operation result, infant future life and awareness lack in the cases of treatment and recovery methods lead to mothers stress raise. A study on the parents' understanding of cardiovascular congenital disease in infants was conducted by Cheuk *et al*. in Hong Kong Grantham Hospital and questioned 156 parents. Findings revealed although 59% of parents were aware of disease name, 28.8% of them could appropriately explain related complications. More than 80% were cognizant of heart operation reason and angiography. Half of them were aware of etiology and congenital as well as risk factors and among 56 of parents who talked about medicine treatment, only 25 were cognizant of medicine functions and side-effects. Nearly 59% of parents were aware of suitable level of sport activities of infant. In total, findings showed infants' parents were a little aware of the case and available educational programs are not enough also they are in urgent need of revolution to raise parents' understanding of their infant disease and this awareness can cause the stress reduction.[24] Findings of a study conducted by In an article in 2007, Lee *et al*. in Seoul questioned 51 mothers of infants suffering from congenital cardiovascular disease showed that parents' stress is in direct relationship with the following factors: Social supports,

understanding lacks and awareness lack. In the case of family support, present study findings showed family support in infant care leads to mother's stress reduction.[25] Some studies emphasized on the family support positive effect in mothers stress reduction.[18,26] In other words, family members collaborating in mental support of infant and mother can reduce mothers' stress. It is highly recommended all the members of families having a congenital-suffering infant co-operate in infant's treatment and care. There was not any statistically significant relationship between mothers' stress and education (P = 0.75), infants' hospitalization background (P = 0.57), congenital disease background (P = 0.24), family support in infant's care (P = 0.08); it means, these factors did not have any effect on mothers' stress. Elian's results in the case of mothers' education effect lack on stress were correlate with the present findings.[27,28] Infants after operation are suffering from stress too much,[3] but it is not exactly clear to what extent these stresses are relevant to operation conditions, hospitalization in intensive care unit, or mothers' stress; therefore, further studies having higher samples are highly recommended.

CONCLUSION

This study showed that mothers' stress level of infants being operated is high; however, this high level can be reduced by appropriate interventions such as awareness rising in the case of disease type, operation procedure and future life.

REFERENCES

1. Mazer P, Gischler SJ, Koot HM, Tibboel D, van Dijk M, Duivenvoorden HJ. Impact of a child with congenital anomalies on parents (ICCAP) questionnaire; a psychometric analysis. Health Qual Life Outcomes 2008;6:102.
2. Eskedal L, Hagemo PS, Eskild A, Aamodt G, Seiler KS, Thaulow E. Survival after surgery for congenital heart defects: Does reduced early mortality predict improved long-term survival? Acta Paediatr 2005;94:438-43.
3. Poley MJ, Stolk EA, Tibboel D, Molenaar JC, Busschbach JJ. Short term and long term health related quality of life after congenital anorectal malformations and congenital diaphragmatic hernia. Arch Dis Child 2004;89:836-41.
4. Meberg A, Lindberg H, Thaulow E. Congenital heart defects: The patients who die. Acta Paediatr 2005;94:1060-5.
5. Van Rijen EH, Utens EM, Roos-Hesselink JW, Meijboom FJ, van Domburg RT, Roelandt JR, *et al*. Styles of coping and social support in a cohort of adults with congenital heart disease. Cardiol Young 2004;14:122-30.
6. Solberg Ø, Dale MT, Holmstrøm H, Eskedal LT, Landolt MA, Vollrath ME. Long-term symptoms of depression and anxiety in mothers of infants with congenital heart defects. J Pediatr Psychol 2011;36:179-87.
7. Hsiang-Yang C, Ting-Wei H, Chao-Hua C. Applying data mining to explore the risk factors of parenting stress. Expert Syst Appl 2010;37:598-601.
8. Board R, Ryan-Wenger N. State of the science on parental stress and family functioning in pediatric intensive care units. Am J Crit Care 2000;9:106-22.
9. Shudy M, de Almeida ML, Ly S, Landon C, Groft S, Jenkins TL, *et al*. Impact of pediatric critical illness and injury on families: A systematic literature review. Pediatrics 2006;118 Suppl 3:S203-18.
10. Wray J, Sensky T. Psychological functioning in parents of children undergoing elective cardiac surgery. Cardiol Young 2004;14:131-9.
11. Hauser-Cram P, Warfield ME, Shonkoff JP, Krauss MW, Sayer A, Upshur CC. Children with disabilities: A longitudinal study of child development and parent well-being. Monogr Soc Res Child Dev 2001;66:i-1.
12. Briggs-Gowan MJ, Carter AS, Skuban EM, Horwitz SM. Prevalence of social-emotional and behavioral problems in a community sample of 1- and 2-year-old children. J Am Acad Child Adolesc Psychiatry 2001;40:811-9.
13. Secco ML, Moffatt ME. Situational, maternal, and infant influences on parenting stress among adolescent mothers. Issues Compr Pediatr Nurs 2003;26:103-22.
14. Copeland D, Harbaugh BL. Differences in parenting stress between married and single first time mothers at six to eight weeks after birth. Issues Compr Pediatr Nurs 2005;28:139-52.
15. Woolfson L, Grant E. Authoritative parenting and parental stress in parents of pre-school and older children with developmental disabilities. Child Care Health Dev 2006;32:177-84.
16. Faught J, Bierl C, Barton B, Kemp A. Stress in mothers of young children with eczema. Arch Dis Child 2007;92:683-6.
17. Franck LS, McQuillan A, Wray J, Grocott MP, Goldman A. Parent stress levels during children's hospital recovery after congenital heart surgery. Pediatr Cardiol 2010;31:961-8.
18. Vrijmoet-Wiersma CM, Ottenkamp J, van Roozendaal M, Grootenhuis MA, Koopman HM. A multicentric study of disease-related stress, and perceived vulnerability, in parents of children with congenital cardiac disease. Cardiol Young 2009;19:608-14.
19. Majnemer A, Limperopoulos C, Shevell M, Rohlicek C, Rosenblatt B, Tchervenkov C. Health and well-being of children with congenital cardiac malformations, and their families, following open-heart surgery. Cardiol Young 2006;16:157-64.
20. Lawoko S. Factors influencing satisfaction and well-being among parents of congenital heart disease children: Development of a conceptual model based on the literature review. Scand J Caring Sci 2007;21:106-17.
21. Wirrell EC, Wood L, Hamiwka LD, Sherman EM. Parenting stress in mothers of children with intractable epilepsy. Epilepsy Behav 2008;13:169-73.
22. Vrijmoet-Wiersma CM, Hoekstra-Weebers JE, Margreet de Peinder WM, Koopman HM, Tissing WJ, Treffers PD, *et al*. Psychometric qualities of the dutch version of the pediatric inventory for parents (PIP): A multi-center study. Psychooncology 2010;19:368-75.
23. Carter JD, Mulder RT, Darlow BA. Parental stress in the NICU: The influence of personality, psychological, pregnancy and family factors. Personal Ment Health 2007;1:40-50.
24. Cheuk DK, Wong SM, Choi YP, Chau AK, Cheung YF. Parents' understanding of their child's congenital heart disease. Heart 2004;90:435-9.
25. Lee S, Yoo JS, Yoo IY. Parenting stress in mothers of children with congenital heart disese. Asian Nurs Res 2007;1:2.
26. Tak YR, McCubbin M. Family stress, perceived social support and coping following the diagnosis of a child's congenital heart disease. J Adv Nurs 2002;39:190-8.
27. Kang N, Cole T, Tsang V, Elliott M, de Leval M. Risk stratification in paediatric open-heart surgery. Eur J Cardiothorac Surg 2004;26:3-11.
28. Miles MS, Brunssen SH. Psychometric properties of the parental stressor scale: Infant hospitalization. Adv Neonatal Care 2003;3:189-96.

Source of Support: Our study was supported by Yazd Cardiovascular Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran. **Conflict of Interest:** None declared.

To,
The Editor

Covering Letter

Submission of Manuscript for publication

Dear Sir,

We intend to publish an article entitled

_____

in your journal.
On behalf of all the contributors I will act and guarantor and will correspond with the journal from this point onward.

Prior presentation of the data reported in this manuscript:

Organisation
Place
Date

We have done sufficient work in the field to justify authorship for this manuscript.

We hereby transfer, assign, or otherwise convey all copyright ownership, including any and all rights incidental thereto, exclusively to the journal, in the event that such work is published by the journal.

Thank you,
Yours' sincerely,

Name of corresponding contributor

Signature

Title of the manuscript:

Type of manuscript:
Running title:
Contributors:

	First name	Middle name initial	Last name	Highest academic degree	Names of departments and institutions (including city and state)	Email addresses
1						
2						
3						
4						
5						
6						

Corresponding Author:
Name:
Address:
Phone numbers:
Facsimile numbers:
E-mail address:

Total number of pages:
Total number of tables:
Total number of figures:
Total number of supplementary files:
Word counts: For abstract: For the text:

Acknowledgement:

Conflict of interest:

Financial Support:

Contributors' form

Contribution details (to be ticked marked as applicable):

	Contributor 1	Contributor 2	Contributor 3	Contributor 4	Contributor 5	Contributor 6
Concepts						
Design						
Definition of intellectual content						
Literature search						
Clinical studies						
Experimental studies						
Data acquisition						
Data analysis						
Statistical analysis						
Manuscript preparation						
Manuscript editing						
Manuscript review						
Guarantor						