PRIORITIZING NEWBORN CARE FACTORS IN COMMUNITY PRACTICES AMONG MOTHERS USING TOPSIS METHOD

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Abstract

Health and survival of the Newborn is depends on the care, given to them. Although care of Newborn is very essential element in reducing child mortality, it often receives less than optimum attention. The world has been committed to improve newborn health. Current global evaluations confirm that commitment to improving newborn health makes meaningful socio-economic contribution. Many other reasons related to newborn's health why they have been neglected and why the huge mortality rates and neonatal deaths are unseen and undocumented.The primary objective of this paper is to prioritizing newborn care factors among mothers using TOPSIS method. The period for assessment of community practices among mothers was from 2013 to 2015 and results indicate each newborn care factor and their prioritizing ranking.

Keywords: Newborn Care Factors, Community Practices, TOPSIS

1. Introduction

Mortality rate of newborn babies is one of the most neglected health problems in the world. It is estimated that four million newborns worldwide die before the age of 1 month and another four million are stillborn each year. Death during the neonatal period (the first 28 days of life) represents almost two-thirds of the total deaths in the first year of life and 40% of deaths before the age of five. It is estimated that the global burden of neonatal mortality to be 5 million, including 3.2 million deaths occur during the first week of life. Each year 26 million babies are born in India. Of these, nearly 1.2 million die during the postpartum period, before the completion of 4 weeks of life, up to a quarter of all deaths among newborns in the world. Where India, contribute 30% of neonatal deaths 3.9 million worldwide. Decreased mortality

rates in the world's under-five and infant mortality over the past four decades, but rates remained high infant mortality relatively unchanged. It is believed that the main causes of death for newborn children are complications of prematurity (28%), sepsis and pneumonia (26%), birth asphyxia and infections (23%) and tetanus (7%), congenital anomalies (7%), diarrhea (3%), with low birth contribute to a large proportion of the deaths.

Since the problem of the availability of quality care for all, always leads is a multi-faceted, the solution will be necessary. There is sufficient evidence to show that most neonatal care can be delivered in basic homes through primary health care in an effective manner in terms of cost. Thus, to reduce neonatal mortality, and must develop strategies for home births safe, including neonatal care essential, along with the development of the means of proper care of the newborn in the locale and ensure referral sound for newborns only those who cannot be managed at home. Many life-threatening conditions can be prevented or treated with low-tech, and improve labor and delivery care, and attention to the physiological needs of the newborn. Causes and neonatal mortality, and organize care coverage and delivery, recovery, and low birth weight, low body temperature, low temperature rise of technology, and the reduction of infections, and what are some of the important areas that need to be addressed, and showed the infant mortality rate has declined significantly during the 1980s and early of 1990s. After that, the pace of decline slowed significantly. The previous decline in infant mortality rate (IMR) is largely due to the decline in mortality after birth, with mortality rates for newborns (NMRs) do not contribute significantly. As a result, now nearly two-thirds of infant deaths are being contributed by NMR. Thus, the focus on the health of the child turned to neonatal health. This was rightly so, but it should not be at the expense of health interventions for children in the age group of 1 month to 5 years. We review the current rate of child mortality between birth and 5 years in India. The mortality rate in the age group of 0-28 days is about 35/1000 live births, 1-12 months, about 30/1000 live births and 1-5 years about 26/1000 live births. Thus, the proportion of neonatal mortality rates in the mortality rate of about 1.3 Age 1-5. In contrast, in most developed countries the ratio is more than 10, and so on, while efforts are underway to reduce neonatal mortality in India, it is also important that the risk of death of a child who stays postpartum period reduces to a great extent; Last, there will be only a shift in the burden of death from early childhood to the later part of early childhood.

Review ages at death during the first 28 days reveals that two-thirds of deaths occur in the first week of life, and two-thirds of these during the first days of life (2 surveys the baseline for the project intervention multi-centric Home-based Indian Council of Medical Research [ICMR]. Thus, approximately 45% of neonatal deaths occur within 48 hours of birth. Major causes of death during this period are birth asphyxia and trauma, and problems related to low birth weight (LBW) (such as hypothermia, and respiratory problems, nutrition and infections after birth) and distortions. Most of these problems occur because of inadequate care during pregnancy and during labor. Inadequate care immediately after birth and inadequate care low birth weight infants during the first 48 hours contribute to the rest. Although a large proportion of women will be classified as high-risk and identify institutional delivery, but more than 75% of all births in the community, mostly in the hands of unskilled midwives with little care after birth, either the mother or the newborn. Clearly, we must focus package of interventions not only on the newborn alone, but treats dyad mother of one child.

2. Review of Literature

The survival of the newborn is an issue demanding immediate attention in developing countries. Of the almost four million infants deaths that occur yearly the world over 98% happen developing countries. Most newborns die at home because of the lack of proper facilities (WHO, 1996). Almost two-thirds of the deaths happen in the first month. Among these deaths two-thirds die in the first week and out of these 2/3rd die in the first 24 hours (Lawn 2001).Despite several efforts by governments all over the world, neonatal mortality rate just goes on increasing. This happens mostly because very little emphasis is placed on neonatal and maternal health programmes in the overall schemes of healthcare in countries.

Healthcare spanning antenatal intra-natal and postnatal periods, i.e. assistance during pregnancy, labour and delivery is importance for ensuring the health of infants. Care is needed most during the first week of life because nearly three-fourths of neonatal mortality occurs during this period. Furthermore care given to the pregnant mother can enhance the chances of survival of the infant.Proper healthcare facilities, regular checkups, vaccination etc. are imperative for a healthy pregnancy and birth. Overall nutritional care of women during their youth also plays a major role in reducing infant's mortality. For example nutrition of young girls can affect their adult height, which in turn can influence the outcome of labour and delivery. The folic acid status of the mother during pregnancy period can

determine the incidence of some congenital abnormalities in the fetus, Hence maternal care is directly related to the survival of the baby. Sub-sahaharan Africa, where neonatal rate is one of the highest in the world, does not have any facility for ensuring assistance during birth. It is estimated that about 12 million pregnant women do not get tetanus immunization.

Households are the nation's health production system because they produce health at a micro level in the community. Even newborn care remains neglected, adversely impacting MDGs on child health which pledges to reduce less than 5 years mortality by the year 2015. Protecting maternal and newborn lives is essential for securing the future of mankind.Quite understandably the levels of social and economic development, cultural practices and the quality of medical facilities of a region directly affect the neonatal and prenatal mortality rate and morbidity rate (WHO, 2002).The death of a woman during childbirth is a violation of her right to life and a social injustice to her family and her community since nearly all maternal mortality is avoidable. Since the health of a nation are directly dependant on the social and economic development of a country, its health indicators are directly influenced by the social and economic conditions prevalent in the country. The most sensitive health indicators are maternal and infant mortality rates. Women in India are in a subordinate position to men. They are not equal partakers of the national economic resources and are in constant threat of violence from men. A lot of these factors contribute in making up the general health framework of the females in the country. It goes without saying that maternal health affects the infant's health directly. Hence the poor chances of infant and maternal mortality in India (Deogaonkar, 2004).

The socio-economic factors that affect the state of health at a national level are a complex issue. They act at multiple levels of the individual, the family and the community. Hence they are difficult to measure or analyze. An individual woman will take health decisions for herself according to her level of education, her occupation, level of personal income and her autonomy. The health of the mother and the new born baby are a function of a myriad other factors such as the total family income, the occupation and the education of the family members. The socio-economic factors that influence health are a result of the collective resources and wealth of a community (McCarthy and Maine, 1992). According to Parlato et al. (2004), people's behaviours regarding change in intrapartum care practices is influenced and constrained by four factors: informational, social, cultural and economic.

Informational constraints could be a client's lack of knowledge regarding the current recommended neonatal care and the outcomes of the practices. Simply put, sometimes people do not know the latest developments in maternal and infant care. This leads to an inability to avail benefits of a sound medical treatment.Many a time social factors in a community discourage the utilization of modern health care facilities. For example, in India, rural communities put a lot emphasis on the opinion of the elders of the house. A mother -in-law will most likely have a say in the way a woman should care for herself during pregnancy. This influence may be weaker in urban areas where people are more aware of modern medical developments.

Cultural influences too play a major role in a tradition bound society. A woman is often required to fit into a role set for her by the cultural dictates of her country. Sometimes these roles come in the way of a healthy pregnancy.Economic constraints are the most difficult to overcome. A lack of financial stability curtails several benefits which are sometimes essential for the health of the mother and the baby. For example, the unavailability of financial resources may lead to a lack of proper medication and facilities (Parlato*et al*, 2004). The list of newborn care factors were adopted from Jeet et al. (2013).

Table 1: List of Newborn care factors in Community Practices among Mothers

S. No.	Factors	Representation
1	Mothers know by themselves how to breast feed their child, so counseling is not required	F1
2	For the first 6 months of life baby should not be given water, "JanamGhhuti," honey or any other milk except breast milk	F2
3	Immunizing the child is important as this will save the child from many diseases	F3
4	Breast milk provides nourishment to the newborn	F4
5	Breast feeding helps in farming an emotional bond between mother and newborn	F5
6	Wash hands thoroughly with soap and water before handing the newborn	F6
7	Massaging with oil before bath helps to keep the newborn skin healthy	F7

	and improves blood circulation	
8	The newborn should be immunized during the first week of life with BCG,OPV, and hepatitis B	F8
9	Child should always be taken to a big hospital if he/she falls sick	F9
10	Children get loose motions due to effect of evil eye	F10
11	A baby less than 2.5 kg will definitely gain weight and so needs no special care	F11
12	Colostrum is harmful to the newborn	F12
13	Breast milk is not best food for newborn	F13
14	The newborn should be bathed immediately after birth	F14
15	The practice of applying kajal to the newborn eyes is good	F15
16	Newborn should not be dressed with soft and cleaned cloths	F16

Source: Adopted from Jeet*et al.* (2013)

3. Data and Methodology

The main reason was this study is to identify most important Newborn factor in Community practices among mothers using TOPSIS method. Primary information was gathered through an organized structured questionnaire using five point indexed approach (Assari et al., 2012). The respondents gave reactions from 1 to 5 for first eight criteria, where 1stands for not important, 2 stands for less important, 3 stands for average, 4 stands for important and 5 stands for very important. For factors,the total sample size was 150, taken from the urban slum of Lucknow city. In this study, purposive sampling technique was used for data collection.

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│   │ Final ranking of the Newborn baby factors │  │
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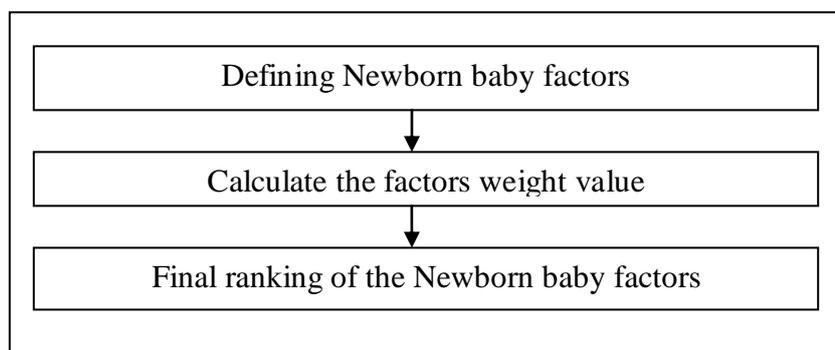
Figure 1: The Research Framework

3.1 The Technique for Order Preference by Similarity to an Ideal Solution Method (TOPSIS)

TOPSIS is one of the most useful techniques to provide priorities of the available alternatives. This method was developed by Hwang and Yoon in 1981. According to this technique, a positive ideal solution maximizes the benefit criteria and minimizes the cost criteria, whereas a negative ideal solution maximizes the cost criteria and minimizes the benefit criteria. The TOPSIS method has six steps which are given below (Yadav et al., 2016):

Step 1: Construct the Decision Matrix (A)

$$A = (a_{ij})_{m \times n} = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{bmatrix}$$

Step 2: Establish the normalized decision matrix. The normalized value p_{ij} is computed asfollows:

$$P_{ij} = A_{ij} / \sqrt{\sum_{i-1}^{m} A_{ij}^2}$$

$i = 1, 2, ..., m$ and $j = 1, 2, ..., n$.

Step 3: Calculate the weighted normalized decision matrix. The weighted normalized value v_{ij} is computed as follows: $v_{ij} = p_{ij} \times w_j$ i $= 1, 2,..., m$ and j $= 1, 2, ..., n$.

Where w_j is the weight of the Jth criterion or attribute and $\sum_{j=1}^{n} w_j = 1$

Step 4: Determine the positive ideal (A^*) and negative ideal (A^-) solutions.

$$A^* = \{(\max_i v_{ij} \mid j \in C_b), (\min_i v_{ij} \mid j \in C_c)\} = \{v_j^* \mid j = 1,2,...,m\}$$

$$A^- = \{(\min_i v_{ij} \mid j \in C_b), (\max_i v_{ij} \mid j \in C_c)\} = \{v_j^- \mid j = 1,2,...,m\}$$

Step 5: Calculate the separation measures of each alternative from the positive ideal solution and the negative ideal solution, respectively, are as follows:

$$S_i^* = \sqrt{\sum_{j=1}^{m}(v_{ij} - v_j^*)^2}, \, j = 1,2,...,m$$

$$S_i^- = \sqrt{\sum_{j=1}^{m}(v_{ij} - v_j^-)^2}, \, j = 1,2,...,m$$

Step 6: Calculate the relative closeness to the ideal solution. The relative closeness of the alternative A_i with respect to A^* is defined as follows:

$$RC_i^* = \frac{S_i^-}{S_i^* + S_i^-}, i = 1, 2, ..., m$$

Step 7: Rank the preference order.

4. Data Analysis and Results

4.1 Demographic profile

All the respondents were mothers who live in slum areainLucknow city of India. Table 3 shows the demographic profiles of the respondents.

Table 2: Demographic profile of the respondents

Demographic		Frequency	Percentage (%)
	Female	150	100
	Total	150	100
Age (Years)	18 - 25	40	33.33
	26 - 35	66	55.00
	36 - 45	14	11.67
	Total	150	100
Educational Qualification	Upto 10th	86	71.67
	12th	30	25.00
	Graduate	3	2.50
	Others	1	0.83
	Total	150	100
Monthly income (Rs.)	Below 5000	3	2.50
	5001 - 10000	34	28.33
	10001 - 15000	83	69.17
	15001 and above	0	0
	Total	150	100

From the above table, it was found that study was conducted on mothers; to know newborn care factors in community practices among mothers. In the sample, 33.33 percent of respondents belong to age group 18-25 years, 55.00 percent of the respondents are from age group of 26-35 years and 11.67 percent of the respondents are from age group of 36-45 years. Out of sample size of 150, 71.67 percent of the respondents have upto high school level education, 25 percent has higher secondary level and 2.50 percent has graduate level education.

4.2 Weight calculation and ranking

The weights of the criteria calculated from the Table 5 are arranged in Table 4(Adopted from Assari et al., 2012).

Table 3: Weights value (W)

	First eight factors (F1 to F8)	Last weight factors (F9 to F16)
$W_{1,1}$	0.01131	0.12114
$W_{2,2}$	0.08216	0.2445
$W_{3,3}$	0.13962	0.12596
$W_{4,4}$	0.36124	0.39938
$W_{5,5}$	0.40567	0.10902
SUM	1	1

Source: Compiled by author

Now TOPSIS method is applied to this calculated weight value to get the ranking of Newborn care factors in Community Practices among Mothers. Table 5 shows the original data matrix collected from the respondents

Table 4: Respondent responses from the questionnaire

Factors	Not Important	Less Important	Average	Important	Very Important
F1	0	5	0	59	86
F2	0	43	28	71	8
F3	4	1	0	54	91
F4	4	2	1	48	95
F5	0	0	63	82	5
F6	2	0	27	112	9
F7	0	2	0	44	104
F8	0	4	1	42	103
F9	0	38	68	43	1
F10	0	39	24	73	14
F11	0	32	19	92	7
F12	0	3	5	111	31
F13	0	1	1	138	10
F14	0	122	0	27	1
F15	72	47	4	18	9
F16	0	5	1	91	53

Source: Compiled by author

From the TOPSIS method,first need to normalize the original data matrix by using the formula in the second step of the TOPSIS method as Table 6 shows:

Table 5: Normalized Decision Matrix from the questionnaire

Factors	Not Important	Less Important	Average	Important	Very Important
F1	0	0.57369	0	18.1682	34.37324
F2	0	42.43014	10.58686	26.31022	0.297443
F3	2.666667	0.022948	0	15.21932	38.48632

F4	2.666667	0.09179	0.013504	12.02514	41.94409
F5	0	0	53.596	35.09421	0.116189
F6	0.666667	0	9.844163	65.47023	0.376451
F7	0	0.09179	0	10.10446	50.26784
F8	0	0.367162	0.013504	9.206751	49.3058
F9	0	9.936904	61.76874	7.78977	0.015434
F10	0	10.46678	7.694376	22.45088	3.025066
F11	0	7.046669	4.822343	35.65853	0.756266
F12	0	0.061934	0.333957	51.90793	14.83208
F13	0	0.006882	0.013358	80.23168	1.543401
F14	0	102.4244	0	3.071251	0.015434
F15	72	15.20126	0.213733	1.365	1.250155
F16	0	0.172038	0.013358	34.88755	43.35413

Source: Compiled by author

Then, the weighted normalized matrix is calculated by multiplying each normalized matrix value with their weight value. The calculated weight value is given in the Table 4. Table 7 represents the weighted normalized decision matrix from the third step of TOPSIS method.

Table 6: Weighted Normalized Decision Matrix

Factors	Not Important	Less Important	Average	Important	Very Important
F1	0	0.047134	0	6.563003	13.94426
F2	0	3.486065	1.478137	9.504193	0.120664
F3	0.030166	0.001885	0	5.497764	15.61282
F4	0.030166	0.007542	0.001885	4.343912	17.01554
F5	0	0	7.483067	12.67729	0.047134
F6	0.007542	0	1.374441	23.65019	0.152716
F7	0	0.007542	0	3.650093	20.39225
F8	0	0.030166	0.001885	3.325808	20.00198
F9	0	2.429621	7.780172	3.111059	0.001683
F10	0	2.559179	0.969156	8.966379	0.329782
F11	0	1.722945	0.607405	14.24121	0.082446
F12	0	0.015143	0.042064	20.73086	1.616943
F13	0	0.001683	0.001683	32.04273	0.168256
F14	0	25.04327	0	1.226589	0.001683
F15	8.722407	3.716782	0.026921	0.54515	0.136288
F16	0	0.042064	0.001683	13.93331	4.72632

Source: Compiled by author

After getting the weighted normalized decision matrix, we find out the positive ideal ($A*$) and negative ideal ($A-$) solutions from step 4 of TOPSIS method, which is given in Table 8.

Table 7: Max and Min value

First eight factors	Max	0.030166	3.486065	7.483067	23.65019	20.39225
(F1 to F8)	Min	0	0	0	3.325808	0.047134
Last eight factors	Max	8.722407	25.04327	7.780172	32.04273	4.72632
(F9 to F16)	Min	0	0.001683	0	0.54515	0.001683

Source: Compiled by author

Now applied step 5 of TOPSIS method to get separation measures of each alternative from the positive ideal and negative ideal solution. After getting the value of separation measure, relative closeness to the ideal solution were calculated using step 6 in TOPSIS method. After that, ranking has given each Newborn care factors in Community Practices among Mothers. The rank of the each of the Newborn care factors in Community Practices among Mothersare shown in Table 9.

Table 8: Final ranking of Newborn care factors in Community Practices among Mothers

Factors	Newborn care factors in Community Practices among Mothers	RC_i*	Rank
F1	Mothers know by themselves how to breast feed their child, so counseling is not required	0.41597057	6
F2	For the first 6 months of life baby should not be given water, "Janam Ghhuti," honey or any other milk except breast milk	0.22171458	8
F3	Immunizing the child is important as this will save the child from many diseases	0.43388998	5
F4	Breast milk provides nourishment to the newborn	0.44425431	4
F5	Breast feeding helps in farming an emotional bond between mother and newborn	0.33877233	7
F6	Wash hands thoroughly with soap and water before handing the newborn	0.48737118	**1**
F7	Massaging with oil before bath helps to keep the newborn skin healthy and improves blood circulation	0.4846613	**2**
F8	The newborn should be immunized during the first week of life with BCG,OPV, and hepatitis B	0.47636484	**3**
Minimization			
F9	Child should always be taken to a big hospital if he/she falls sick	0.18343218	8
F10	Children get loose motions due to effect of evil eye	0.20505536	6
F11	A baby less than 2.5 kg will definitely gain weight and so needs no special care	0.30304522	4
F12	Colostrum is harmful to the newborn	0.40298942	**3**

F13	Breast milk is not best food for newborn	0.52932586	**1**
F14	The newborn should be bathed immediately after birth	0.42934983	**2**
F15	The practice of applying kajal to the newborn eyes is good	0.19520553	7
F16	Newborn should not be dressed with soft and cleaned cloths	0.3007515	5

Source: Compiled by author

5. Conclusion

Our paper showed the ranking of newborn care factors in community practices among mothers using TOPSIS methods. The findings shows that

   i.   So considering the positive side results, the most important factor has been allocated to Wash hands thoroughly with soap and water before handing the newborn(0.48737118). In next level, Massaging with oil before bath helps to keep the newborn skin healthy and improves blood circulation(0.4846613) with, the newborn should be immunized during the first week of life with BCG, OPV, and hepatitis B(0.47636484) have taken place.

   ii.   In Negative side results, the most important factor has been allotted to Breast milk is not best food for newborn (0.52932586) and The newborn should be bathed immediately after birth (0.42934983) with, Colostrum is harmful to the newborn (0.40298942) have taken place.

   iii.   In positive side results, the lowest important factor has been allotted to for the first 6 months of life baby should not be given water, "JanamGhhuti," honey or any other milk except breast milk (0.22171458) where as in negative side results, child should always be taken to a big hospital if he/she falls sick (0.18343218).

This paper discusses practical implication of community practices and also focuses on factors that can reduce infant mortality rate. These factors are basically practiced in the community. Here is the need of awareness among mothers to know the importance of maximizing factor and reduction of minimizing factors.

6. Limitation and Scope of Future research

The present study has considered eight maximization and eight factors to provide ranking of Newborn care factors in Community Practices among Mothers. The finding of the current study provides understandingbased on limited factors. The result may not be generalized to the country level because of limitation.In future, author may be considered more factors,

different method for weight calculation and used integrated approach to provide ranking. In present study, we have not been considered alternative so researcher can used alternatives.

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