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Moderate Effects of Sense of Coherence on the relationship between Postpartum Depression and Its Related Factors at a Teaching Hospital in Sri Lanka

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Abstract

Introduction: In Sri Lanka, postpartum depression (PPD) is gaining attention; however, only few studies exist. Based on our literature review, studies on the sense of coherence (SOC) are extremely limited.

Objectives: To examine the PPD status and whether the moderation effects of SOC would exist between PPD and PPD-related factors among mothers.

Methods: From November 2012 to January 2013, we recruited 490 mothers who visited the outpatient paediatric clinic for a check-up of their babies born in the previous year. Each woman was interviewed using a questionnaire in the Sinhalese language by trained interviewers. Valid responses from 470 mothers were assessed using Edinburgh Postnatal Depression Scale. Chi-square test and multiple logistic regression analysis were used to examine whether SOC has a moderation effect on the relationship between PPD and its related factors.

Results: 15.5% of mothers showed PPD tendencies. Those more likely to show PPD included mothers with present illness (odds ratio = 4.33; 95% confidence interval: 1.44–13.01), who were primiparous (2.38; 1.31–4.33) and with childcare-related stress (3.36; 1.89–5.98). Among mothers with low SOC, PPD was associated with present illness, primiparity and childcare-related stress. In the high SOC group, PPD was not significantly associated with any other factors examined.

Conclusions: Approximately >15% of mothers showed PPD tendencies that were significantly related to present illness, primiparity and having childcare-related stress. SOC may have moderation effects on the association between PPD and related factors. It is important to understand mothers targeted for primary preventive care for PPD.

Key words: postpartum depression, childcare-related stress, Sri Lanka, Edinburgh postnatal depression scale, sense of coherence

Introduction

Depression among mothers during the postpartum period is known as 'Postpartum depression' (PPD). It usually begins within 1–12 months after giving birth [1].

Most PPD is self-limiting, as it resolves within months of onset [2, 3]. However, for many women, childbirth is the stressor that triggers the start of recurrent or chronic episodes of depressive disorder [1]. It is reported that PPD affects a mother's function in her family as well as the

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development of her child as it affects the quality of care that the mother can offer [4 – 6]. It may also reduce the quality of interaction between the mother and child [7] and contribute to cognitive disorder in the infant [8], adjustment disorder in the infant [9] and fathers' onset of depression [10]. Thus, PPD has significant impact on the soundness of families and society. Thus, implementing measures against PPD is important not only for mothers' health but also for the sound development of children and wellbeing of generations to come.

The evaluation of 59 previous studies in industrial countries revealed that the average prevalence of PPD was 13% among all mothers (n = 12,810; 95% confidence interval (CI): 0.12, 0.13) [11]. Moreover, a meta-analysis of 84 studies on PPD published during the preceding 10 years revealed 13 risk factors. In order of their strength of association, these included prenatal depression, low self-esteem, childcare-related stress, prenatal anxiety, life stress, poor social support and marital relationship, history of previous depression, difficult temperament of the infant, maternity blues, single marital status, low socioeconomic status and unplanned/unwanted pregnancy [12].

Although many studies have addressed PPD in industrial countries, studies remain lacking in developing countries. According to a review of PPD research in Asia by Piyanee et al. [13], its prevalence is 22%–23% in India, 15%–22% in Indonesia and 33% in Vietnam. These figures show that the prevalence of PPD is high in Asia.

Sri Lanka has excellent health indices among developing countries. The literacy rate among young people (15 to 24 years old) is nearly 100%. The maternal mortality rate is 39/100,000 childbirths, and neonatal mortality rate is 10/1,000 [14]. Thus, Sri Lanka maintains an outstanding level of health for mothers and children, especially in comparison to other developing countries. The total fertility rate declined from 5.8 in the 1950s and 1960s to 2.3 in 2010 [14, 15] and continues to decline today. In addition, due to recent changes in lifestyle and social environment, such as stress and unemployment [16], Sri Lanka's suicide rate is rising. These recent changes in the social environment may be affecting the onset of PPD in Sri Lanka, as they increase the stress associated with significant life events for families, such as pregnancy, childbirth and childcare. Hence, additional studies on PPD are necessary [17, 18, 19].

A person's sense of coherence (SOC) is the ability to preserve his/her health under very stressful conditions, such as those associated with critical life events, essentially the ability

to cope with stress [20]. It is less likely for PPD to occur in women with high SOC [21, 22].

To the best of our knowledge, studies on SOC have been extremely limited in Sri Lanka. Thus, we conducted this study to examine the status of PPD among mothers in Sri Lanka and identify its related epidemiological factors. Further, we examine and confirm whether SOC would provide moderate effect against certain factors related to PPD among these mothers.

Methods

Research methods

From November 2012 to January 2013, we implemented a cross-sectional study of 490 consecutive mothers who had given birth in the previous year and brought their babies to the outpatient paediatric clinic at the University of Peradeniya Teaching Hospital in the Kandy District for a health check-up. This study site was selected because it is one of the three teaching hospitals, and more than 90% of births occur at public facilities in the Kandy District.

We gathered basic information using a semi-structured questionnaire in the Sinhalese language. Seven trained interviewers conducted 20-minute face-to-face interviews.

Data collection

Data gathered included basic attributes, information on maternal health status and delivery, information on baby, and childcare situation. In assessing a partner's cooperation in childcare, mothers chose between 'Yes, very often/Sometimes' and 'Hardly ever/Never'.

Measurement scale for PPD

To screen for PPD, we used the Edinburgh Postnatal Depression Scale (EPDS) developed by Cox et al. [23]. This scale has been widely used as a depression screening tool and has been adapted and validated in many languages [24].

This 10-item self-report questionnaire assessed depressed mood, loss of interest and joy, insomnia, feelings of worthlessness and guilt, decline in thinking ability and concentration and suicidal intent. Participants rated their agreement with the items (0, 1, 2 or 3) based on their experience during the week prior to the survey. A higher total score for all items (range: 0 to 30) indicated a depressive state. We use the cut-off EPDS value of 9/10 similarly as in a previous study to estimate the national prevalence of PPD in

Sri Lanka [19].

Scale for measuring childcare-related stress

We modified a scale developed by Sato et al. that measured childcare-related stress [25]. This scale measured degree of childcare-related stress. It included 12 items on child-caused stress and 10 items on mother-caused stress. Participants were asked to assess their level of agreement with the items on a scale of 1–4. A higher total score for all items (range: 22–88) indicated more intense childcare-related stress. As the participants included mothers with children who had not yet weaned, we added items on breastfeeding/nursing to address related issues. The questionnaire was subjected to several rounds of reverse translation, and a pretest confirmed that it was correctly understood before it was administered to the participants.

Sense of coherence (SOC)

The SOC concept was introduced by Antonovsky [20] in connection with his concept of 'salutogenesis'. Here, we adopted the SOC-13 scale translating it into Sinhalese. This scale consists of 13 items assessing three major aspects of SOC: meaningfulness (the belief that life is worthwhile and that life events are meaningful; 4 items), comprehensibility (the belief that one can predict and understand life events; 5 items) and manageability (the belief that one can manage even tough situations; 4 items). Our translation was subjected to several rounds of back translation and was then confirmed through a pretest that questions could be correctly understood. Participants assessed the strength of their agreement with each item on a scale of 1–7. A higher total score for all items (range: 13 to 91) indicates a higher SOC.

Data analysis

Data were analysed using statistical software (SPSS Statistics version 27; IBM, Armonk, NY, USA). To examine the relationships between basic attributes, health status and childcare support and PPD, we used the chi-square test. We identified PPD-related factors using multiple logistic regression models (Forced Entry Method) including any variables for which a significant difference was obtained through univariable analysis and the variables that were potential confounding factors, such as months after childbirth [26], experience with child prior to marriage, family members in household [12], household income per month [12] and husband's participation in childcare [12]. We performed these multiple logistic regression analyses for SOC high and low

groups (<71 or ≥ 71 , based on the median for the total score) to examine the moderation effect of SOC on the relationship between PPD and its related factors. The internal consistencies of EPDS, childcare-related stress scale and SOC-13 were assessed by Cronbach's α , where 0.701, 0.879 and 0.784, respectively, were acceptable.

Ethical considerations

Both verbally and in writing, participants were informed that their participation was voluntary, and they could withdraw from the study any time. In addition, the confidentiality of all data was assured, and data were anonymised. The participants acknowledged receiving this information by providing their signatures on a consent form. The study was approved by both the Hokkaido University Graduate School of Medicine Ethics Committee and the University of Peradeniya Faculty of Medicine Ethics Committee.

Results

Descriptive statistics and mother's postpartum depression

Of the 490 mothers who had given birth within the previous year, 20 participants were excluded because of a medical history of depression or current treatment for depression, twin pregnancy or voluntary withdrawal from the study. Thus, 470 mothers were included in this study.

Table 1 shows relationships between basic attributes, health status of mothers and children, history of childbirth, childcare support status, and stress in childcare and PPD. The average age of mothers was 28.6 ± 5.3 years. The average age of babies at the time of the interview was 3.99 ± 3.3 months. 73 participants (15.5%) showed postpartum depressive tendencies. No significant relationship was found between mothers' basic attributes, child's sex and birth weight and PPD.

We found that mother's physical discomfort, present illness, reproductive history and type of last delivery were significantly associated with PPD.

PPD was not significantly related to husband's participation in childcare. Childcare-related stress was found to be significantly related with PPD.

Table 1 Estimation of the prevalence of postpartum depression in Sri Lanka according to various variables

	Postpartum depression					P-value ^a
	Total	Depressed		Not depressed		
	n	n	(%)	n	(%)	
Total	470	73	(15.5)	397	(84.5)	
Sociodemographic characteristics						
Mother's age (years)						
<20	31	5	(16.1)	26	(83.9)	
20–29	277	42	(15.2)	235	(84.8)	
30–39	152	25	(16.4)	127	(83.6)	
40–49	10	1	(10.0)	9	(90.0)	0.95
Mother's employment						
Non-working	395	65	(16.5)	330	(83.5)	
Working	75	8	(10.7)	67	(89.3)	0.20
Family members in household						
Extended family ^b	326	46	(14.1)	280	(85.9)	
Nuclear family	144	27	(18.8)	117	(81.3)	0.20
Household income per month (Rs) ^c						
<10,000	20	6	(30.0)	14	(70.0)	
10,000–19,999	178	27	(15.2)	151	(84.8)	
>20,000	269	40	(14.9)	229	(85.1)	0.19
Mother's education (years)						
No formal education	5	2	(40.0)	3	(60.0)	
<6	35	6	(17.1)	29	(82.9)	
6–11	201	29	(14.4)	172	(85.6)	
12–14	189	32	(16.9)	157	(83.1)	
>15	39	4	(10.3)	35	(89.7)	0.46
Mother's health/obstetric history						
Mother's physical discomfort						
No	252	29	(11.5)	223	(88.5)	
Yes	218	44	(20.2)	174	(79.8)	0.01
Present illness						
No	452	66	(14.6)	386	(85.4)	
Yes	18	7	(38.9)	11	(61.1)	0.01
Reproductive history						
Primiparous	251	47	(18.7)	204	(81.3)	
Multiparous	219	26	(11.9)	193	(88.1)	0.04
Type of last delivery						
Vaginal	264	31	(11.7)	233	(88.3)	
Caesarean	206	42	(20.4)	164	(79.6)	0.01
Child's sex						
Boy	238	37	(15.5)	201	(84.5)	
Girl	232	36	(15.5)	196	(84.5)	0.99
Child's weight at birth (g)						
<1500	34	7	(20.6)	27	(79.4)	
1500–2499	166	25	(15.1)	141	(84.9)	
2500–3999	265	40	(15.1)	225	(84.9)	
>4000	5	1	(20.0)	4	(80.0)	0.85
Childcare support and stress						
Husband's participation in childcare						
Very often/sometimes	438	66	(15.1)	372	(84.9)	
Hardly ever/never	31	6	(19.4)	25	(80.6)	0.52
Childcare-related Mother's stress						
High	226	52	(23.0)	174	(77.0)	
Low	244	21	(8.6)	223	(91.4)	<0.001

^aP-values were calculated using chi-square test.

^bExtended family was a family consisting of the nuclear family and their blood relatives.

^c1Rs (Sri Lanka rupee) = 0.0075 USD

Childcare-related stress: high, median > 41; low, ≤41

Childcare-related stress and SOC

Table 2 shows childcare-related stress. The child-caused item that was considered most stressful was 'Baby is in poor health condition' (average score with a standard deviation: 2.6 ± 1.2), followed by 'Baby's growth is late/delayed' (2.4 ± 1.2).

The mother-caused item that was considered most stressful was 'If your baby has any shortcoming, you feel responsible' (2.5 ± 1.2), followed by 'You don't know how to bring up your baby in the future' (2.2 ± 1.2).

Table 3 shows participants' SOC scores. The average score for 'Manageability' tended to be lower than 'Comprehensibility' and 'Meaningfulness'.

Factors associated with mother's depression in total and in the SOC low and high groups

Multiple logistic regression analysis showed that childcare-related stress, present illness, reproductive history and type of last delivery were significantly related to PPD, after controlling for potential confounding factors (Table 4).

For the low SOC group, present illness, primiparous and childcare-related stress were found to be associated with the occurrence of PPD. Conversely, any variables were not significantly associated with PPD in the high SOC group (Table 5).

Discussion

In this study, we showed the prevalence of PPD among mothers in Sri Lanka. Our finding (15.5%) was much lower than the 27.1% ($n = 1492$) reported in a previous study that Agampodi et al. conducted in eight Sri Lankan provinces [19]. A possible reason is that mothers with a history of depression or current treatment for depression and mothers of twins were excluded from the analysis. In addition, more than one-half of the participants were from middle-class families with income of over 20,000 rupees per month. All participants were married and most of their partners had jobs. Thus, they could be considered a population of mothers with comparatively stable positions in Sri Lankan society.

Considering the prevalence of PPD in South Asian countries, it was 36% ($EPDS \geq 12$) in Pakistan [27], 9% ($EPDS \geq 10$) in Bangladeshi [28], 6% ($EPDS \geq 10$) in India [29] and 4.9% ($EPDS > 12$) in Nepal [30]. With our finding of 15.5% prevalence of PPD among Sri Lankan mothers, the country has the second highest prevalence among South Asian countries.

We must acknowledge the importance of mental

healthcare for mothers during child rearing, as more than 15% of the participants showed postpartum depressive tendencies.

The most common form of pain or discomfort reported by the participants was low back pain, which was reported in 30.2% of all participants. Health guidance to prevent low back pain must be initiated during pregnancy because mothers are likely to experience increased pain while they are pregnant.

As for birth style, 43.8% had a caesarean birth. A national rate of caesarean birth exceeding 15% is considered overuse of the technique according to the standards of the World Health Organization [31]. The reasons for the high caesarean birth rate in this present study may be related to the fact that this research was performed at a large hospital and 42.5% of the babies were less than 2,500 g (low birth weight).

Childcare-caused stress is also considered a risk factor for PPD [12]. Our study demonstrated that childcare-related stress was significantly associated with PPD. The highest scored item in child-caused stress was 'Baby is in poor health condition' and in mother-caused stress was 'If your baby has any shortcoming, you feel responsible'. An understanding of child-caused stress is important as a cornerstone in the treatment of PPD. To enable mothers to cope with these stressful issues, childcare support tailored to their child's individual challenges must be made available.

Also, the nature of the perceived shortcomings varied among individuals, but the sociocultural situation in Sri Lanka, which encourages this belief, gives rise to a strong need for care for mothers' feelings.

Our findings suggest that SOC provides a moderation effect against those three factors associated with mother's depression: present illness, primiparity and intense childcare-related stress. SOC can be defined as a stable orientation towards life experience. However, according to Antonovsky, professionals may temporarily change or positively correct clients' SOC through the provision of effective support [20]. Further discussion on intervention options such as SOC-enhancing experiences for mothers is likely beneficial.

The limitations of this study are related to the restricted methodology and participants. All participants were recruited at one medical facility and were able to read Sinhalese. Moreover, their health behaviour levels may have originally been high because they brought their babies for health check-ups. In Sri Lanka, some mothers do not bring their babies for health check-ups after birth. To address these limitations, we intend to continue our investigations among

Table 2 Childcare-related Mother's stress in Sri Lanka

Item	Mean \pm SD (range, 1–4) ^a
Child-caused	
1 Poor health ^b	2.6 \pm 1.2
2 Late/delayed growth	2.4 \pm 1.2
3 Nursing (Mother's milk)/weaning problem	2.4 \pm 1.2
4 Intense crying at night	2.3 \pm 1.2
5 Intense crying throughout the daytime	2.2 \pm 1.2
6 Hard to calm	2.0 \pm 1.1
7 Difficult to get child to sleep	1.9 \pm 1.1
8 Unhappy unless held	1.8 \pm 1.1
9 Irregular sleep pattern	1.7 \pm 0.9
10 Throw temper tantrum ^b	1.6 \pm 0.9
11 Getting easily distracted	1.5 \pm 0.7
12 Too shy	1.2 \pm 0.7
Mother-caused	
1 Blame one for any child's shortcomings	2.5 \pm 1.2
2 Uncertain about how to bring up in the future	2.2 \pm 1.2
3 Feel regret for childcare with everything	1.8 \pm 1.0
4 Confused by too much information ^b	1.7 \pm 0.9
5 Treat child emotionally	1.7 \pm 0.9
6 Uncertain about how to care	1.6 \pm 1.0
7 Feel bad about bothering husband ^b	1.5 \pm 0.9
8 Husband's indifference to childcare ^b	1.4 \pm 0.8
9 Lack of time to spend with child ^b	1.4 \pm 0.8
10 Want to quit childcare	1.3 \pm 0.6

^aWe requested that participants assess their agreement level with items on a scale of 1–4. This scale constitutes 12 and 10 items on child-caused and mother-caused stress, respectively.

A higher score for all items (range: 1–4) indicates more intense stress.

^bMissing data point

SD, standard deviation

Table 3 Sense of coherence (n = 470)

	Mean	SD
	4.7	1.8
	5.9	1.6
	5.9	1.4
	6.3	1.2
	4.8	2.0
	5.3	1.7
	5.5	1.6
	5.6	1.4
	5.6	1.7
	4.6	2.0
	5.1	2.1
	5.2	1.7
	5.3	1.8

Table 4 Multiple logistic regression analysis of Mother's depression in Sri Lanka

Item	Postpartum depression				Unadjusted		Adjusted ^a	
	Total	Depressed	Not depressed	n (%)	OR	95% CI Lower-Upper	OR	95% CI Lower-Upper
Childcare-related stress								
High	226	52 (23.0)	174 (77.0)	174	3.17	1.84-5.47	3.36	1.89-5.98
Low	244	21 (8.6)	223 (91.4)	223	Ref.		Ref.	
Present illness								
Yes	18	7 (38.9)	11 (61.1)	11	3.72	1.39-9.95	4.33	1.44-13.01
No	452	66 (14.6)	386 (85.4)	386	Ref.		Ref.	
Physical discomfort								
Yes	218	44 (20.2)	174 (79.8)	174	1.95	1.17-3.24	1.69	0.99-2.92
No	252	29 (11.5)	223 (88.5)	223	Ref.		Ref.	
Reproductive history								
Primiparous	251	47 (18.7)	204 (81.3)	204	1.71	1.02-2.87	2.38	1.31-4.33
Multiparous	219	26 (11.9)	193 (88.1)	193	Ref.		Ref.	
Type of last delivery								
Caesarean	206	42 (20.4)	164 (79.6)	164	1.93	1.16-3.19	1.61	0.94-2.78
Vaginal	264	31 (11.7)	233 (88.3)	233	Ref.		Ref.	

Ref, reference; OR, odds ratio; CI, confidence interval

Childcare-related stress: high, median > 41; low, ≤41

^a Adjusted ORs were calculated by adjusting all variables in this table using the multiple logistic regression model.

We used multiple logistic regression analysis to control potentially confounding roles of months after childbirth, experience with child prior to marriage, family members in household, household income per month and husband's participation in childcare.

Table 5 Factors associated with Mother's depression according to multiple logistic regression analysis

Item	SOC low group				SOC high group			
	n	OR	95% CI		n	OR	95% CI	
			Lower	Upper			Lower	Upper
Childcare-related stress								
High	141	2.94	1.29	6.70	85	2.45	0.99	6.08
Low	84	Ref.			160	Ref.		
Present illness								
Yes	8	20.17	3.11	130.88	10	1.00	0.11	8.94
No	217	Ref.			235	Ref.		
Uncomfortable symptoms								
Yes	118	1.86	0.90	3.84	100	1.72	0.69	4.33
No	107	Ref.			145	Ref.		
Reproductive history								
Primiparous	118	3.46	1.57	7.64	133	1.71	0.62	4.69
Multiparous	107	Ref.			112	Ref.		
Type of last delivery								
C-section	104	1.81	0.90	3.65	102	1.23	0.48	3.13
Vaginal	121	Ref.			143	Ref.		

Ref, reference; OR, odds ratio; CI, confidence interval; EPDS, Edinburgh Postnatal Depression Scale; SOC: high, median ≥ 71 ; low, < 71

Childcare-related stress: high, median > 41 ; low, ≤ 41

ORs were calculated by adjusting all variables in this table by the multiple logistic regression model. We used multivariable logistic regression analysis to control for potentially confounding roles of months after childbirth, experience with child prior to marriage, family members in household, household income per month and husband's participation in childcare.

mothers in rural (estate) areas, as they may have a higher risk of PPD. Moreover, we excluded the variable of mother's health status and baby's health condition from multiple logistic regression analysis because of their skewed distribution. Further studies are needed to clarify these factors.

One positive aspect of maternal and child health in Sri Lanka is the close support offered to community residents by public health maternity nurses. To make good use of this resource, we must establish an active support system to approach disease-related stress, anxiety and concerns related to primiparity and childcare-related stress. To develop such support system, it is important to increase the public's interest in PPD and to improve our understanding of EPDS and SOC levels of mothers targeted for primary preventive care. Sri Lanka needs to intensify its activities at the national level to raise awareness of PPD and allow medical service workers to provide better support within a restricted time frame for health guidance.

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Conflicts of Interest

There are no conflicts of interest.

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