Client perceived quality of the postnatal care provided by public sector specialized care institutions following a normal vaginal delivery in Sri Lanka: A cross sectional study

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Abstract

Background: Majority of the maternal and neonatal adverse events take place during the postnatal period. Provision of high-quality care during this period can minimize these events. Assessment of mothers’ perceptions of the quality of care received by them provides valuable feedback to improve the care and ultimately outcomes. Methods: A cross-sectional survey was conducted in specialized institutions of Colombo district, Sri Lanka, to assess the maternal perceptions of the quality of regular postnatal care and its correlations, using an interviewer administered questionnaire. The questionnaire contained 23 items distributed under three main domains: technical and information domain, interpersonal care domain and ward facilities and cleanliness domain. Each item was given a score from 1 to 5 and total scores were calculated for the total questionnaire and for each domain. Descriptive statistics were used to assess the perceptions and multivariate analysis was conducted to assess the significant correlates of positive perceptions. Results: The median score obtained for the questionnaire was 108, (Inter Quartile Range 96-114). The median scores of the technical care and information domain, interpersonal care domain and ward facilities and cleanliness domain were 43 (IQR 38-45), 33 (IQR 30-35) and 32 (IQR 28-35) respectively. Attending teaching/ specialized hospitals (1.6, p<0.001), 20-35 age group (aOR=1.8, p=0.024), and services such as initiation of breast feeding within one hour of delivery (2.1, p=0.009), pain relief during episiotomy suturing (2.2, p<0.001), practicing Kangaroo Mother Care (1.4, p=0.035), receiving health advices by doctors or midwives (2.1, p<0.001) were significant correlates of positive perceptions. Conclusions: Majority of mothers had favourable perceptions of the quality of care received by them. However, the ward facilities and environment domain has obtained lower ratings compared to technical and interpersonal care domains. Several services were significantly associated with favourable perceptions. Authorities should consider these findings when attempting to improve care quality. Further, this assessment should be carried out regularly to obtain more current data.

Key words: Client perceptions, Postnatal care, Quality of care, Client perceived care, institutional postnatal care

Background
The first few weeks following the delivery of a baby is a crucial period for both mother and the newborn as a majority of maternal and newborn adverse outcomes takes place in this period (1–3). Immediate postnatal period or the first 24 hours after delivery is the most vital period, where more than half of the postpartum maternal deaths (4) and 25%-45% of the newborn deaths occur (5). Provision of evidence-based care with adequate quality during this period is vital to ensure a smooth recovery of the mother and the baby.

Quality of health care is now considered an essential component of health services (6). It ensures that services are effective, efficient, patient centered, cost effective and safe (4). Further it should be regularly monitored and upgraded to ensure best outcomes. Assessment of client experiences and perceptions of the care is increasingly being considered as a useful monitoring measure (7–10). Client perceived quality is defined as “subjective and dynamic perception of the extent to which expected health care is received by a person” (11). It provides health workers and authorities with valuable information to improve the service quality and render it patient-centered. Client perceptions of the quality of service received by them will also determine their level of satisfaction with the services. It is known that unsatisfied clients may not return to the same facility even during an emergency and even if the facility provides state of the art care (6,10).

In Sri Lanka, around 99.9% women receive institutional postnatal care, and a clear majority of them (94.6%) receive care from public sector institutions (12). Evidence based practices are implemented in these institutions through national guidelines, and regular supervision is aimed to maintain the highest level of care. However, client perceived quality is not a popular measure of quality in this context. Further, though studies have assessed mothers’ perceptions and satisfaction of antenatal and intra-natal services (13,14), studies on institutional postnatal care as sparse in Sri Lanka.

Therefore, this study was conducted with the aim of assessing the quality of the regular postnatal care provided by the public sector specialized institutions in the district of Colombo, Sri Lanka, following a normal vaginal delivery (NVD), from the mothers’ perspective, and the factors that are associated with their perceptions. This is a component of a larger study that evaluated the quality of the regular institutional postnatal care comprehensively. We hope that the information gained from
this study would be beneficial to improve the institutional postnatal care services in Sri Lanka to meet mothers’ expectations.

Methods
A cross sectional analytical study was conducted from the 1st December 2016 to the 30th April 2017 in the public sector specialized health institutions in Colombo district. Colombo District is situated in the south west of Sri Lanka and has an area of 699 km². It’s mixture of urban, semi urban, rural and estate areas. It has the highest population in Sri Lanka, which is 20,359,439 (15).

Study setting
Curative health sector in Sri Lanka is comprised of three levels: primary, secondary and tertiary. Primary health services provide the field and the first contact care, while the secondary and tertiary level institutions provide specialized services under the guidance of specialist health professionals. Thus, in the institutions providing specialized Maternal and Newborn Health (MNH) care, both routine basic care and comprehensive care for emergencies and complications are provided through a team of trained health care providers.

Of the 330,898 deliveries that took place in government hospitals in 2014, the highest proportion (12.6%) took place in Colombo district (12). It is worthwhile to note that Colombo district also reports the lowest rate of vaginal deliveries, which was 55.1% in year 2017 (16). This may be attributed to the fact that the two main referral institutions for pregnant mothers are situated in this district.

The six state sector health care institutions providing specialized MNH care in Colombo account for 98.4 % of the total deliveries (17). These six institutions include three base hospitals (secondary level), one teaching hospital (tertiary level) and two special hospitals specialized to provide women’s’ health services only. Altogether, there are 17 wards providing specialized MNH services in these six institutions.

Study population and sampling
The study population consisted of mothers who had been discharged following a normal vaginal
delivery. Mothers who had complications and the mothers with newborns who had complications following a normal delivery were excluded from the study as their care would deviate from the regular postnatal care, which was the focus of the study. A sample of 1300 mothers was deemed necessary to detect the significant associations of client perceptions.

Mothers were selected from all 17 wards. Number of mothers selected from each ward was proportionate to the number of NVDs in the first quarter of 2016 in that ward. Consecutive sampling technique was used to select eligible mothers in each ward.

**Data collection**

A thorough literature survey was conducted to identify a suitable instrument to assess client perceptions of institutional postnatal care in Sri Lanka. Though a number of instruments were available for assessment of client satisfaction, instruments assessing client perceived quality of postnatal care were scarce. The possibility of using the instrument used by van Duong et al, to evaluate the client perceived quality of maternity services in rural Vietnam (11) was assessed by an expert panel consisting of three public health specialists. According to the experts, several items in this instrument were not relevant to the institutional postnatal care provision in Sri Lanka. Therefore a new instrument - The Client Perceived Quality of Institutional postnatal Care (CPQIPNC) questionnaire- was developed by the Principal Investigator (PI), for data collection. It had a total of 23 items divided into three domains: technical care and information, interpersonal care and ward facilities and cleanliness. Each item was rated on a five-point Likert scale, from one to five, and had five statements: “very poor”, “poor”, “neutral”, “good” and “very good”. The scores ranged from one for “very poor” ratings, to five for “very good” ratings. Therefore, the total obtainable score ranged from 23 to 115. It was validated by conducting an exploratory and confirmatory factor analysis and had an internal consistency and test retest reliability of 0.94.

In addition, socio demographic information from the mother and information on receipt of services by the mother and the baby that are stipulated in the National guidelines on maternal care (18) were also collected.
Interviews were conducted in a pre-identified place in the ward with adequate privacy after all the discharge procedures were completed for each selected mother. As discharges are done twice daily at 12 noon and at 5.00 pm, two interview sessions were done daily, approximately at these times.

Data collection was conducted by trained pre-intern medical officers via an interviewer administered questionnaire after obtaining the informed written consent from the eligible mothers. Data collectors were supervised by the PI throughout the study and 2% of all questionnaires were re-administered by the PI to ensure reliability of data collection.

**Data Analysis**

Data analysis was conducted by SPSS version 21. Inter-rater reliability was assessed by computing Intra class correlation coefficient for data collectors’ results and PI’s results. The cut off was set at 0.7 (19).

Descriptive statistics were used to describe the basic information of the study sample, services received by them during the postnatal period and their perceived quality.

A binomial logistic regression analysis was carried out to determine the associations of client perceptions, as most of the statistical assumptions were met for binomial regression analysis. The total score obtained by each participant for the CPQIPNC questionnaire was taken as the dependent variable and was dichotomized into low and high client perceived quality, based on the median value of the total score. Identification of the independent variables was accomplished by reviewing previous literature and expert opinion. The variables included socio demographic factors, pregnancy related factors, institutional factors and services received during the current hospital stay. Information on independent variables were gathered during interviews of the mothers using questionnaires developed by the PI. They were transformed into categorical variables for further analysis. The independent variables to be included in the analysis were determined by a bivariate analysis. The variables with less than 10 counts in one category were excluded from the analysis. The significance level for selection was taken as p<0.25 (20). Using the variables selected, a backward stepwise binomial logistic regression was conducted to assess the significant correlates. Goodness of
fit of the regression model was assessed by the regression diagnostics (overall percentage of the predictions that were correctly classified by observed outcomes, The Omnibus test, Cox and Snell Square test, Negelkerke R Square test, Hosmer and Lameshow test).

Necessary administrative clearances were obtained and the ethical clearance for the study was obtained from the ethics Review Committee, faculty of Medicine, University of Colombo, Sri Lanka.

Results
Of the selected mothers, 1265 responded to the questionnaire, giving a response rate of 97.3%. Participation from individual wards ranged between 76.5% - 100%. Of the non-respondents, four did not consent for participation (0.3%) and another 31 mothers (2.4%) who consented, had left the hospital before the interview was initiated.

The inter-rater reliability was satisfactory for all the data collectors as all had obtained an Intra class correlation coefficient between 0.96-0.99.

Socio demographic and pregnancy related details of the participants

Age ranged from 16 to 46 years, while most mothers belonged to the 20-35 years age group (n=1074, 84.9%). More than three fourths have obtained an educational qualification above year 11 (n=1029, 81.3%). A clear majority of the study sample (n=958, 75.7%) was unemployed. Average monthly income showed a wide variation, ranging from Rs.3,000.00 (17 USD) to Rs.350,000.00 (2000 USD). Close to half of the study sample were primi mothers (n=525, 41.5%) (Table 1).

Table 1: Distribution of the study participants by socio demographic characteristics
## Socio-demographic characteristic

| Characteristic               | N=1265 |   |
|-----------------------------|--------|---|
| **Age in years**           |        |   |
| <20                         | 73     | 5.8 |
| 20-35                       | 1074   | 84.9 |
| >35                         | 118    | 9.3 |
| **Ethnicity**               |        |   |
| Sinhala                     | 909    | 71.9 |
| Muslim                      | 184    | 14.5 |
| Tamil                       | 172    | 13.6 |
| **Religion**                |        |   |
| Buddhist                    | 841    | 66.5 |
| Catholic                    | 112    | 8.9 |
| Islam                       | 192    | 15.2 |
| Hindu                       | 120    | 9.5 |
| **Highest level of education** |     |   |
| No schooling                | 5      | 0.4 |
| Year 1-5                    | 23     | 1.8 |
| Year 6-11                   | 208    | 16.4 |
| Passed year 11 exam         | 518    | 40.9 |
| Passed year 13 exam         | 409    | 32.3 |
| Graduate                    | 102    | 8.1 |
| **Occupation**              |        |   |
| Unemployed                  | 958    | 75.7 |
| Unskilled manual            | 19     | 1.5 |
| Skilled manual              | 82     | 6.5 |
| Sales and services          | 54     | 4.3 |
| Clerical                    | 54     | 4.3 |
| Professional                | 98     | 7.7 |
| **Husbands’ level of education** |     |   |
| No schooling                | 5      | 0.4 |
| Year 1-5                    | 17     | 1.3 |
| Year 6-11                   | 167    | 13.2 |
| Passed year 11 exam         | 561    | 44.3 |
| Passed year 13 exam         | 419    | 33.1 |
| Graduate                    | 94     | 7.4 |
| Other\(^a\)                 | 2      | 0.2 |
| **Husbands’ Occupation**    |        |   |
| Unemployed                  | 5      | 0.4 |
| Unskilled manual            | 119    | 9.4 |
| Skilled manual              | 531    | 42 |
| Sales and services          | 407    | 32.2 |
| Clerical                    | 114    | 9 |
| Professional                | 87     | 6.9 |
| Other\(^a\)                 | 2      | 0.2 |
| **Income**                  |        |   |
| No income                   | 2      | 0.2 |
| <30,000.00                  | 252    | 19.9 |
| 30,000-39,999               | 344    | 27.2 |
| 40,000-49,999               | 231    | 18.3 |
| =>50,000                    | 436    | 34.5 |
| **Parity (Current)**        |        |   |
| P1                          | 525    | 41.5 |
| P2-P4                       | 723    | 57.2 |
| =>P5                        | 17     | 1.3 |

\(^a\)-These participants did not have a husband
Mothers’ account on services received by them

Services recommended in the national guidelines to be delivered during the postnatal period following a NVD were received by most of the participants. Majority have initiated breast feeding within one hour after delivery (n=1184, 93.6%) as recommended, and 99.4% mothers have exclusively breast fed while in the postnatal ward. The technique of breast feeding has been assessed by a health care worker for majority of mothers (n=1249, 98.7%) and corrected where necessary. Least frequently received service was the opportunity to practice kangaroo mother care (KMC) (n=970, 76.7%).

Inquiry was made into the services provided to the mother and the newborn at discharge. All the mothers and 99.8% (n=1263) of the babies have been examined by a medical officer at discharge, and over 95% of the examinees were informed about their examination findings (1235 participants were informed about their examination findings and 1256 were given information following examination of the baby). Privacy has been ensured during 99% of the examinations by covering the examination area (n=1254).

All mothers have received health advices regarding the postnatal period. The main sources of information were nursing officers and midwives (n=1195, 94.5% and n=190, 86.2% respectively). Medical officers have provided health advices to only 750 mothers in the study sample (59.3%) (Table 2).

Table 2: Services received by the mother and the baby during the postnatal period

| Service received (N=1265) | Frequency | %   |
|--------------------------|-----------|-----|
| Handing over the baby to the mother immediately after the delivery | 1104      | 87.3|
| Informing the mother about baby’s health after the examination | 1209      | 95.6|
| Provision of adequate pain relief during the suture of episiotomy | 1125      | 88.9|
| Provision of refreshment to the mother following delivery | 1233      | 97.5|
| Practice of kangaroo mother care in the ward | 970       | 76.7|
| Regular examination of the mother during the postnatal period | 1193      | 94.3|
| Service Provided                                                                 | Score | Satisfaction |
|---------------------------------------------------------------------------------|-------|--------------|
| Initiation of breast feeding within one hour after the delivery                  | 1184  | 93.6         |
| Receipt of assistance from the staff to initiate breast feeding                  | 1230  | 97.2         |
| Exclusive breast feeding in the postnatal ward                                   | 1258  | 99.4         |
| Observation of the breast feeding technique by a health care worker              | 1249  | 98.7         |
| Inquire about the baby’s health in the postnatal ward                            | 1260  | 99.6         |
| Getting assistance to ambulate as soon as possible                               | 1149  | 90.8         |
| Mother was given the opportunity to keep the baby near her in the postnatal ward | 1261  | 99.7         |
| Received health advices from a doctor                                            | 750   | 59.3         |
| Received health advices from a nursing officer                                   | 1195  | 94.5         |
| Received health advices from a midwife                                           | 1090  | 86.2         |
| Provision of BCG vaccine to the baby before discharge                            | 1261  | 99.7         |
| Examination of the mother by a medical officer before discharge                  | 1265  | 100          |
| Conduct of the examination in a covered area                                     | 1254  | 99.1         |
| Presence of a female health care worker if the doctor is male (N=802)            | 775   | 96.6         |
| Provision of information about the examination findings                          | 1235  | 97.6         |
| Examination of the baby before discharge by a medical officer                    | 1263  | 99.8         |
| Informing the mother about baby’s health after the examination (n=1263)          | 1256  | 99.4         |

**Client perceived quality of institutional postnatal care (CQIPNC)**

The total obtainable score of CQIPNC ranged from 23 to 115. The obtainable scores for technical care and information domain, interpersonal care domain and ward facilities and cleanliness domain ranged between 9-45, 7-35, and 7-35 respectively.

The total score obtained for the CQIPNC questionnaire in the study ranged from 48 to 115. The median score obtained by the participants for the questionnaire was 108, which was 93.9% of the total obtainable score (IQR- 96-114). Technical care and information domain had a median score of 43 (IQR=38-45). Interpersonal care domain and ward facilities and cleanliness domain had median
scores of 33 (IQR=30-35) and 32 (IQR=28-35) respectively (Table 3).

Table 3: Median values for each domain of the CPQIPNC questionnaire (N=1265)

| Domain                          | Range  | Median | Median as a percentage of the maximum score (%) |
|---------------------------------|--------|--------|-----------------------------------------------|
| Technical care and Information  | 16-45  | 43     | 95.5                                          |
| Information (9)                 |        |        |                                               |
| Interpersonal care (7)          | 16-35  | 33     | 94.3                                          |
| Ward facilities and cleanliness | 16-35  | 32     | 91.4                                          |
| (7)                             |        |        |                                               |
| Total score                     | 48-115 | 108    | 93.9                                          |

Over 90% of the mothers have rated care as ‘good’ or ‘very good’ for all the items included in interpersonal care domain and the technical care and information domain. The ratings reduced somewhat for the items in the ward facilities and cleanliness domain. Only 81.1% have rated the cleanliness of the toilets in the ward as ‘good’ or ‘very good’. The ‘good’ or ‘very good’ ratings percentages for the space and the facilities available were 88.0% and 88.8% respectively (Table 4).

Table 4: Percentage of mothers either satisfied or extremely satisfied with each item in the CPQIPNC questionnaire (N=1265)
| Domain and Item                                                                 | Number | Percentage (%) |
|--------------------------------------------------------------------------------|--------|----------------|
| **Interpersonal care**                                                          |        |                |
| 1. Friendliness shown by the HCWs                                               | 1210   | 95.7           |
| 2. Patience                                                                     | 1166   | 92.2           |
| 3. Promptness of the attention                                                   | 1194   | 94.4           |
| 4. Availability of pain relief during the postpartum period                     | 1233   | 97.4           |
| 5. Respect for privacy                                                           | 1249   | 98.8           |
| 6. Willingness to discuss about your concerns                                   | 1155   | 91.3           |
| 7. Way health care workers treated your family members                           | 1203   | 95.1           |
| **Technical care and Information**                                              |        |                |
| 8. Help given for the initiation of breast feeding                              | 1224   | 96.8           |
| 9. Help received to take care of your baby                                     | 1191   | 94.2           |
| 10. Help received to take care of yourself                                     | 1163   | 91.5           |
| 11. Information on taking care of the baby                                     | 1200   | 94.6           |
| 12. Information on proper method of breast feeding                              | 1237   | 97.8           |
| 13. Information to identify danger signals                                       | 1163   | 91.5           |
| 14. HCWs’ skills to identify and manage health issues of your baby             | 1225   | 96.5           |
| 15. HCWs’ skills to identify and manage health issues in relation to you        | 1219   | 96.4           |
| 16. Information received to clarify your issues                                 | 1169   | 92.4           |
| **Ward facilities and Cleanliness**                                             |        |                |
| 17. Cleanliness of the ward                                                     | 1222   | 96.6           |
| 18. Cleanliness of the toilets & washrooms                                      | 1032   | 81.1           |
| 19. Space in the postnatal ward                                                 | 1114   | 88.0           |
| 20. Adequacy of facilities in the ward                                          | 1124   | 88.6           |
| 21. Adequacy of delivery beds in the labour room                                | 1235   | 97.7           |
| 22. Adequacy of numbers of HCWs                                                  | 1232   | 97.4           |
| 23. Ability to get some rest                                                    | 1130   | 89.3           |

**Determinants of client perceived quality of care**

For this analysis, the scores obtained for the CPQIPNC were categorized into high perceived quality and low perceived quality, based on the median value obtained for the questionnaire. Thus scores below 108 were categorized as low perceived quality (n=632), and scores equal to or above 108 were categorized as high perceived quality (n=633). The bivariate analysis depicted that participant characteristics such as the age between 20-35 years (OR=1.6, p=0.06), husband’s occupation (OR=1.2, p=0.08), average monthly income (OR=0.8, p=0.13), the type of institution used by the mother (OR=1.4, p=0.004); services such as initiation of breast feeding within one hour (2.2, p=0.001), informing the mother after examination of the baby (OR=1.9, p=0.02), provision of
adequate pain relief during episiotomy suture (OR=2.2, P<0.001), giving assistance to practice KMC in the labour room and the ward (OR=1.4, p=0.02), receiving health advices from doctors (OR=2.6, p<0.001) and midwives (OR=3.2, p<0.001), regular examination of the mother (OR=2.0, p=0.009), getting assistance to initiate breast feeding (OR=1.9, p=0.12) were significantly associated with high perceptions of quality of care.

Among these variables, only 20-35 age category (aOR=1.8, p=0.024), teaching and specialized hospitals category (1.6, p<0.001), and services such as initiation of breast feeding within one hour of delivery (2.1, p=0.009), pain relief during suturing of the episiotomy (2.2, p<0.001), Ability to practice KMC (1.4, p=0.035), Receiving health advices by the doctors (2.1, p<0.001) and PHMs (2.1, p<0.001) were identified as significant correlates via the multivariate analysis (Table 5).

The final model explains between 10.7% (Cox & Snell R square) to 14.3% (Negelkerke R Square) of the variation in the client perceived quality. The Omnibus test was statistically significant with a p value of less than 0.001. Hosmer and Lameshow test was not significant, indicating that the model was a good fit to the data. The final model of the binary logistic regression correctly classified 52.5% of client perceptions.

Table 5: Results of the logistic regression on factors associated with a positive maternal perception of quality of care received in the institutional postnatal period
| Variable                                      | Frequency | Crude OR (p value) | aOR (p value) |
|----------------------------------------------|-----------|--------------------|---------------|
| **Socio-demographic variables**              |           |                    |               |
| Age                                          |           |                    |               |
| >35 years                                    | 73        | 1.2 (0.53)         | 1.3 (0.45)    |
| 20-35 years                                  | 1074      | 1.6 (0.06)         | 1.8 (0.024)   |
| <20 years                                    | 118       | 1                  | 1             |
| Husbands’ Occupation                         |           |                    |               |
| Other occupations                            | 608       | 1.2 (0.08)         | 1.2 (0.08)    |
| Unemployed or manual worker                  | 657       | 1                  | 1             |
| Income                                       |           |                    |               |
| ≥ 40,000 Rupees                              | 667       | 0.8 (0.69)         | 0.8 (0.16)    |
| <40,000 Rupees                               | 598       | 1                  | 1             |
| **Institutional characteristics**            |           |                    |               |
| Teaching/ Specialized hospitals              | 994       | 1.6 (<0.01)        | 1.4 (<0.01)   |
| Base hospitals                               | 271       | 1                  | 1             |
| **Service provided to the mother and the newborn** | | | |
| Initiation of breast feeding immediately after the delivery | | | |
| Yes                                         | 1184      | 2.2 (<0.01)        | 2.1 (<0.01)   |
| No                                          | 81        | 1                  | 1             |
| Provision of adequate pain relief for suture of episiotomy (1264) | | | |
| Yes                                         | 1125      | 2.2 (<0.01)        | 2.2 (<0.01)   |
| No                                          | 295       | 1                  | 1             |
| Practicing Kangaroo Mother Care at ward      |           |                    |               |
| Yes                                         | 970       | 1.4 (0.02)         | 1.4 (0.04)    |
| No                                          | 295       | 1                  | 1             |
| Receipt of health advices from the doctors   |           |                    |               |
| Yes                                         | 750       | 2.6 (<0.01)        | 2.1 (<0.01)   |
| No                                          | 515       | 1                  | 1             |
| Receipt of health advices by the Midwives    |           |                    |               |
| Yes                                         | 1090      | 3.2 (<0.01)        | 2.1 (<0.01)   |
| No                                          | 175       | 1                  | 1             |
| Regular examination of the mother in the postnatal period* | | | |
| Yes                                         | 1193      | 2.0 (<0.01)        | -             |
| No                                          | 72        | 1                  | 1             |
| Informing about the baby’s health after examination* | | | |
| Yes                                         | 1209      | 1.9 (0.02)         | -             |
| No                                          | 56        | 1                  | 1             |
| Help received from the health staff for breast feeding*(1255) | | | |
| Yes                                         | 1230      | 1.9 (0.12)         | -             |
| No                                          | 25        | 1                  | 1             |

* These variables were removed in the multivariate analysis prior to the final model

**Discussion**

Client perceptions of the care received by her or him is increasingly being considered a valid measure of quality of healthcare, despite the subjective nature of the measurement. It gives an immediate feedback to the provider on the services provided. Authorities can use these data in quality improvement processes to identify deficiencies in patient centered care (7).
To the best of authors’ knowledge, this is the first study to assess the client perceived quality of regular postnatal care services provided by public sector specialized institutions in Sri Lanka. This study discovered that mothers’ assessment of the quality of institutional postnatal care was favourable, as observed by the high median scores received for the questionnaire. It also identified that each item of care assessed by the questionnaire was rated favourably by most of the mothers. Favourable ratings for client satisfaction and client perception surveys is a well-known phenomenon (21) and has been observed across the world (22–24). A recent review of literature on women’s’ satisfaction with maternal care in developing countries has observed that majority of studies have reported a high level of satisfaction (23). However, in several studies, clients have rated the quality of institutional maternal care as poor (25,26) which have been attributed by some authors to poor quality of health delivery systems, client characteristics such as literacy level, cultural diversity, and techniques of assessment of satisfaction.

Client perceived quality is a multi-dimensional concept and is assessed through a number of related domains (27). During the development of the CPQIPNC tool, three domains were identified, namely, technical care, interpersonal care and ward facilities. These domains have commonly been used to assess client perceptions with institutional care (Wijesinghe, 2012; van Duong et al., 2004). Among them, “ward facilities and cleanliness” domain was rated less favourably than other two domains by the participant mothers. Items such as cleanliness of the toilets and washrooms, space in the postnatal ward and ability to get adequate rest have obtained lowest scores. Ward facilities and related domains have consistently obtained low scores in client perception and client satisfaction surveys. Wijesinghe (2012) (14) and Senerath (2004) (28) have also identified the same phenomenon in relation to intra-natal care in Sri Lanka. The same trend has been reported in international studies, where environmental attributes have been rated negatively in comparison to other attributes (27).

This reflects the relative low priority given to the physical environment of the wards by the authorities in general and mothers’ concern about it. A satisfying physical environment will reduce the maternal stress during the immediate postnatal period. Therefore this provides an important feedback to the authorities to ponder when improving care.
Further, attributes such as technical care and interpersonal care may also receive higher scores due to courtesy bias, where inanimate items such as that assessed by ward facilities domain may be rated more objectively, as suggested by studies assessing the biases associated with exit interviews (29,30). Further, in the current study, mothers have reported that most of the recommended services were provided to them, which may contribute to high ratings of technical care.

**Assessment of determinants of client-perceived quality of care**

Client perceptions may be influenced by many factors besides actual service delivery. Studies have shown that apart from structure, process and outcomes of care, factors such as client characteristics, access to services, financial costs, socio economic and cultural factors may shape the way clients perceive the services (23).

Logistic regression revealed that apart from age, other socio demographic factors were not associated with mothers’ perceptions of the quality of care. Similar findings have been reported by Kambala et al, 2015, where socio demographic factors were found to be related to perceived quality of antenatal care but not delivery or postnatal care (31). Further, literature report that socio demographic associations of client perceptions are not consistent across studies. In addition, most of these associations are non-modifiable, limiting their value in improving care to meet patients’ expectations (32).

Awareness on service related and facility related factors that may influence mothers’ perceptions on the other hand, plays a major role in improving care. The current study found that certain services, such as initiation of breast feeding within one hour of delivery, pain relief during suturing of the episiotomy, ability to practice KMC, receiving health advices by the doctors and midwives were associated with higher ratings of quality of care provided to mothers and the babies. These services may help to create a favourable opinion of the postnatal care in the mother, leading to high perceived quality.

Initiation of breast feeding and skin to skin care immediately after the delivery promotes the bonding between mother and the newborn has been known to improve the maternal perceptions and
satisfaction with care (33,34). Practice of Kangaroo Mother Care also improves bonding through skin to skin care, leading to positive perceptions about quality of care.

Experience of intense pain during labour by the mother has constantly been associated with negative perceptions about labour (35). Therefore, it is reasonable to expect that mothers who received adequate pain relief during suture of episiotomy would perceive care more positively compared to mothers who did not, as demonstrated by the current study.

Previous studies have reported that mothers expect to receive adequate information on important aspects such as breast feeding, child-care and behaviour during the postnatal period (36). Positive perceptions of care by the mothers who receive information as expected is evident in many literature on maternal satisfaction (23). Consistently, the current study revealed that while all mothers have received health advices from either midwives, nurses or doctors, those who received advices from doctors and midwives have perceived care more positively than who did not.

In addition to these services, mothers who received services from teaching and specialized hospitals have rated the quality more favourably than the mothers in the base hospitals. “Good physical environment and efficient management” has been stated as significant predictors of positive assessment of care by mothers (23). Teaching hospitals and specialized hospitals have better facilities and resources than base hospitals and is capable of better management and care than base hospitals. This is consistent with literature that higher-level institutions are associated with more positive maternal perceptions of care, possibly due to better facilities (27).

**Limitations of the study**

Our study had following limitations. Firstly, it assessed the perceptions of the mothers who attend specialized institutions only. The perceptions of the mothers who attend non-specialized institutions may be quite different to these findings. Secondly the effect of courtesy bias that is introduced when information is collected through exit interviews may have led to an over estimation of the results. However, use of interviewers who were not involved in patient care and ensuring privacy during the
interviews were aimed to overcome this issue.

Conclusions And Recommendations
This study presents a cross sectional depiction of postnatal mothers’ perceptions of the care received by them. According to the postnatal mothers’ perceptions, the quality of institutional postnatal care in specialized institutions in Colombo district of Sri Lanka is commendable. However, the ward facilities and environment domain has obtained lower ratings compared to technical and interpersonal care domains. Services such as initiation of breast feeding immediately following delivery, practice of KMC in the ward, getting health advices from doctors or midwives and provision of adequate pain relief during episiotomy suture, and obtaining services from higher level institutions were associated with positive client perceptions. These findings will be useful for quality improvement, and to provide more patient centred care. However, quality assessment should be a regular process which should be an integral component of health care delivery systems. Therefore, it is recommended that this assessment is conducted regularly to get the most updated feedback.

Declarations

*Ethics approval and consent to participate*

The ethical clearance for the study was obtained from the ethics Review Committee, faculty of Medicine, University of Colombo, Sri Lanka.

Informed written consent was obtained from all the participants prior to participation.

*Consent for publication*

Not applicable.

*Availability of data and materials*

The datasets used and/or analysed during the current study are available from the corresponding author on request.

*Competing interests*

The authors declare that they have no competing interests.

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**Authors' contributions**

SAW designed the study, analyzed and interpreted data and prepared the manuscript. MWG and NH provided the technical supervision throughout the study. All authors read and approved the final manuscript.

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