

Household out of pocket expenditure of caesarean section delivery in Bangladesh: A critical review of the published literature

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Abstract: Various studies in Bangladesh examined the cost of caesarean section delivery. However, no systematic investigation on the quality of these studies has been performed. The aim of this study is to systematically review the published literature on caesarean section delivery cost in Bangladesh and to scrutiny the methodological quality of these studies. A comprehensive search strategy was developed to search Medline by the PubMed interface. Due to small number of article was found, various report that was done in cost of cesarean section delivery in Bangladesh were also identified. Among the selected studies, respondent selection procedure was not consistent. Regarding recall error, only two studies mentioned the problem of recall error and only one study took steps to minimize the recall bias. Only one study conducted a scientific method to measure the sample size of the study. Only one study disaggregated medical costs according to various components, whereas only two studies considered productivity lost as a part of their total cost analysis. However, no study measured the cost of intangible which refers to the cost of patient pain and sufferings. The majority of the studies did not follow the scientific method of cost of illness study, which consequently resulted into a lack of robustness of the analysis. In general, the less technical issues are targeted by most of the study. The capacity building on cost of illness analysis among the researcher in Bangladesh is required.

Keywords: Caesarean Section Delivery, Out of Pocket Expenditure, Bangladesh

1. Introduction

Caesarean delivery requires hospitalization of pregnant women. Households have to pay for hospital fees, medicine, blood, travel, and food during the stay [1-3]. In addition, households have to pay the cost for attendants of the pregnant/post-partum women. In most cases, households also have to pay unofficial fees to get access and better quality of services [4, 5]. In infected caesarean section cases, households also have to make additional payment to treat infections or complications. Out of pocket (OOP) payments are a principal means of financing health care, including caesarean section (CS) delivery. Throughout much of the developing world households have to finance large and unpredictable bills from household budget [3, 4, 6-8]. This OOP expenditure for caesarean section delivery have significant burden on household budgets and

contributing to impoverishment. Efforts to decrease maternal morbidity and mortality through caesarean section delivery as a part of the Emergency Obstetric Care service therefore must take account of expenditure incurred by the poor.

Caesarean section delivery in Bangladesh is increasing [9] but at a disproportionate rate among different groups of women – rich and educated urban women are the main recipient of the service [10]. Various studies in Bangladesh examined the cost of caesarean section delivery and the sources of financing the OOP expenditure [4, 5, 12-15]. However, no systematic investigation on the quality of the data collection procedure, coverage of the costing components and analysis method of these studies has been performed.

Our interest concerns on investigating on regarding the state of art of costing analysis, from patient perspective, of caesarean section delivery in Bangladesh. To the best of our

knowledge no country specific investigation has been carried out regarding the shortcomings of the studies related to costing caesarean section delivery. The aim of this study is to systematically review the published literature on caesarean section delivery cost in Bangladesh. Thus the first aim of this study is to map the published literature of costing analysis of caesarean section delivery in Bangladesh. The next interest is to scrutiny the methodological quality of these studies.

2. Materials and Methods

The review was conducted following the accepted guidelines for systematic reviews, including the search strategy, using appropriate search items, providing restrictions to findings, application of inclusion and exclusion criteria and data extraction and analysis.

2.1. Search Strategy

A systematic search of Pubmed for related studies published in English between January, 1972 and December, 2013 was conducted. The 'related articles' function on Pubmed and a hand searching of reference lists from retrieved articles were applied in order to expand the coverage. However, due to small number of article was found, various grey literature such as reports that were done in cost of cesarean section delivery in Bangladesh were also identified. A snow ball method was used to identify such reports. Additional studies that were identified in the course of reading or were brought to attention by experts in related field were included. Literature search was carried out during October 2013 with a combination of key words, MeS Hterms and other free text terms as suitable for the purpose. The search terms used were maternal health, cesarean section, cost, financing, catastrophic expenditure, Bangladesh. The search was restricted to studies published in English language journals and conducted in human subjects.

2.2. Inclusion and Exclusion Criteria

This study was set out to identify and include all published articles or reports that performed costing exercise in cesarean section delivery in Bangladesh. Studies that used primary or secondary data were included. Studies published only in English language and limited to humans were included. Studies not conducted in humans and not in Bangladesh were excluded. Studies were excluded if they do not present any kind of cost or expenditure related data, or if they were

editorial or review articles. Studies that were economic evaluation of different intervention were also excluded.

3. Result

This section is presented in three parts: the results of the search strategy, a mapping of the caesarean section costing literature and a review of the technical characteristics of the articles. With the mapping part, the main interest is to explore the various categories of the costing component covered by the articles. Secondly, in the technical characteristics part, the interest is to observe if the reviewed studies have followed the methodological quality of collecting and analyzing the data.

3.1. Search Result

A total of 1057 abstract were identified from the search done in December, 2013. Abstracts were then screened and 1034 articles were excluded. 23 full text articles were retrieved. 19 full text articles were deemed not to meet the inclusion criteria. Based on searching in grey literature and discussing with the expert in this area 4 report were found for the review. Finally, 4 articles from peer reviewed journal and 4 reports were judged to be eligible for inclusion in the review.

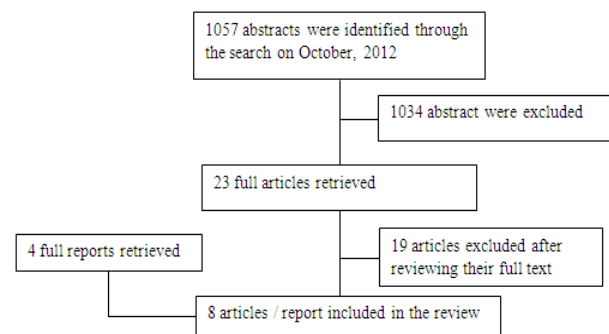


Figure 1. Flow chart of study selection process

3.2. Mapping the Articles / Report

The number of articles on out of pocket expenditure of cesarean section delivery in Bangladesh, published in international journals is very limited. However, few reports have also been done in this area in Bangladesh. Table 1 provides summary of the identified studies related to caesarean section delivery.

Table 1. Summary of study identified for systematic review of consumer cost of caesarean section delivery

Author and year	Methods	Cost item
KawnineNet al, 1998	Measured patient cost in public, NGO and private hospital. Among the women who were interviewed, 209 went through caesarean section delivery. They were interviewed throughout hospitalization.	Cost item: Bed charge, supplies including drugs, food expense, diagnostic test, operation charge, and transport expense. The operation charge was the most expensive component of OOP expenditures. Drugs accounted for a large share of costs at the public hospital.
NaharSand Costello A, 1998	Measured hidden cost of free maternity services in public hospitals. Among the women who were interviewed, 104	Cost item: Hospital fee, medical supplies such as medicine and blood transfusion cost, unofficial payment, accompanied cost,

Author and year	Methods	Cost item
Afsana K, 2004	went through caesarean section delivery. In depth interviews of the mother and their husbands. Cost of hospital maternity care. In depth interview, observation and informal discussion.	transport cost and food cost. Drugs and medicines absorbed 55% of the costs. Cost item: drugs and medicine, lab test, blood transfusion, food, travel, informal payments. Drugs account for largest share; informal payments are significant.
Khan SH, 2005	OOP expenditure in a public hospital. Among the women who were interviewed, 20 went through caesarean section delivery. Cost of delivery during pregnancy, delivery and postpartum in rural areas. Measured patient cost in public and private hospital. Among the women who were interviewed, 65 went through caesarean section delivery.	Cost item: medicine, lab test, food, travel cost, informal payments and other miscellaneous.
Borghi J et al, 2006	Measured household costs for getting maternal and new borne care in rural areas. Measured patient cost in public and private hospital. Among the women who were interviewed, 29 went through caesarean section delivery.	Cost item: transport cost, medical cost, food cost, informal payments, accompanied cost and other miscellaneous.
Khan MNU et al, 2009	Measured patient cost in public, NGO and private hospital.	Cost item: doctor fee, medicine, and laboratory test, transport cost, hospital charge.
Slavea C et al, 2010	Measured patient cost in public, NGO and private hospital.	Cost item: hospital fees, drugs, supplies, laboratory test. Only medical cost was measured.
Sarker BK et al, 2012	Measured household costs for caesarean section delivery in slum areas. The cost was measured in public, NGO and private hospital. Data was collected during hospital stay and after delivery.	Cost item: travel cost, admission fee, investigation cost, drug cost, operation cost, hotel cost, food cost. Indirect cost items included productivity loss of mother and attendant.

3.3. Critical Appraisal of the Retrieved Studies

3.3.1. Methodological Limitations

Identifying types of caesarean section delivery: Costing analysis should be subdivided by if the delivery was elective, i.e. planned before the labor or emergency. Again the analysis should be done whether it was performed before the onset or performed during the labor. The reason is that different caesarean section delivery involve different components and thus may have different cost. In general, the studies did not differentiate between the different types of caesarean section delivery. Two studies [5, 15] informed both emergency and elective caesarean section delivery, but did not provide costing information of emergency and elective caesarean section separately. Though Afsana K, (2004) provided information on emergency caesarean section delivery, the study ignored the cost related to other type of caesarean section delivery.

Respondent selection: while collecting the OOP expenditure of the household, the respondent selection is an important issue. In order to get complete and reliable information of the total expenditure, the women as well as her husband or the head of the household should be interviewed. Alternatively the woman can identify the person for interviewed. Whoever the person is interviewed should have proper knowledge about all the expenditure related to this specific caesarean section delivery. However, among the studies, respondent selection procedure was not consistent. Two studies [11, 12] interviewed the woman only to collect the expenditure related information. The other studies interviewed the woman along with husband or relatives who attended her.

Address recall bias: Collecting costing information during hospital stay or exit interview is the best method to get rid of recall bias of the costing data. Only three studies [4, 12, 15] attempted and collected costing data during hospital study. Though five studies collected data after a

certain period of the caesarean section delivery, only two studies mentioned the problem of recall error [5, 13]. One study [5] took steps to minimize the recall bias, even though these studies were in the risk of being affected by recall bias.

Sample size: To generalize the result, it is important that the studies have adequate sample sizes. Because of very low number of caesarean section delivery and skew nature of the cost data, it is important to have adequate sample size in the study. In general the study collected costing information from all the women who went through the caesarean section delivery in a targeted hospital during a specific time period. Only one study [12] conducted a scientific method to measure the sample size of the study. This study collected information from 390 participants. In contrast, two studies [5, 14] interviewed less than 30 women. This sample size is too small to yield any useful confidence intervals, especially when the data are projected to national level.

Currency information: The exchange rate of the local currency and US dollar or international dollar should be provided in order to make the information comparable with studies from other countries. However, only three studies [5, 7, 13] mentioned the exchange rate between taka and the US dollar. Only one article [7] reported the cost of caesarean section delivery both in US dollar and Taka, whereas one article [5] measured the cost in US dollar only. All four reports measured the cost in local currency. Nevertheless, no study used international dollar for this purpose.

3.3.2. Content Limitation

Disaggregation of costing component: Depending on the objective and perspective of the study costing data should be divided into direct and indirect cost or medical and non-medical cost. The breakdown of all the costing components is important to show while analyzing the OOP expenditure. This information is also needed for policy maker to get

complete picture of the expenditure related to caesarean section delivery in Bangladesh. For instance, in order to introduce voucher program through demand side financing or introducing community health insurance, such information is needed for creating the health package. Though one study [15] disaggregated medical costs according to various components, this study did not cover the indirect cost. Inconsistencies across studies regarding which costs are included and how costs are measured also hamper assessment of the size of the different cost components relative to one another. Three studies [12, 14-15] used charges of hospital as a measure of economic cost. However, such measure may distort cost estimation as charges involve hospital profit and internal cost transfers.

Direct cost: All studies included travel cost and food cost of the mother. However, one study [13] included travel cost of the companion. Only two studies [4, 7] reported separately the cost of blood transfusion though this procedure is common in caesarean section delivery. One of the important costs of caesarean section delivery is the cost of anesthesia that is used in Operation Theater before the surgery. No study informed whether they considered this cost in the analysis.

One of the major components of the medical cost of caesarean section delivery is drug cost as caesarean section delivery needs longer hospital stay and more medicine. Collecting information related to drug cost need to follow specific method – it is needed to collect the name of the prescribed drug, amount used, market price etc. Only one study [11] described the method of collecting costing information related to drug. However, this study did not report the total expenditure related to drug separately. Again this study assumed that all patients purchased the exact amount of medicine that was prescribed by the doctor, though this may not be the case always. The authors explained that this was an emergency issue and the patient and their relative will be less likely to be selective in purchasing the prescribed drug. On the other hand, another study [4] stated that because of the high cost of medicine the relatives of the patient often bought less than the prescribed amount. The two studies thus contradict each other.

Unofficial payment such as tips and other informal payment for broker exist in various hospitals in Bangladesh. Only three studies accounted the unofficial payments such as tips. Interestingly only the articles that were published in peer reviewed journals stated and collected information of the tips. All the reports, which prepared information for mainly the government people and local researcher, did not mention about the tips. Such issue of ignoring unofficial payment in report, whether intentionally or unintentionally, reduces the validity and reliability of these reports. Yet again, in some cases the family may need to pay more than the official charges, which was ignored by all studies, except one [4]. The study mentioned that during admission in the hospital women had to pay more than what was the official charge.

Indirect cost: Indirect costs associated with the value of a woman and/or her companions' time lost as a result of

travelling to the health facility and waiting there. Waiting time for admission, test and other health care is considered as loss of productivity. Sometime this waiting time in hospital can be as high as 2 hours only to be referred in specialized hospital [4]. Only two studies mentioned the waiting time [4, 5]. Again, the most important part of the indirect cost is the productivity lost. Only two studies [12, 13] considered this cost as a part of their total cost analysis. Both study used the information on monthly salary and time involvement during delivery to calculate the productivity loss. However, no study measured the cost of intangible which refers to the cost of patient pain and sufferings.

4. Discussion

Direct costs of caesarean section delivery consist largely of travel costs, consultation fees, hospitalization charges and purchases of drugs and supplies. The relative share of each depends on the type of provider from whom care is sought. Caesarean section delivery is characterized by higher hospitalization charges due to longer lengths of stay, and larger outlays on drugs and medical supplies. Indirect costs, including the opportunity costs of time lost due to caesarean section delivery, where they have been estimated, account for a substantial proportion of total caesarean section delivery costs.

The research base of the study carried out in the consumer cost of caesarean section delivery is weak and the studies carried out in this area have many limitations. The majority of the studies limited their analysis to cost incurred during the delivery only. These studies did not consider post-delivery complication that may arise later on. Readmission of hospital may occur due to complication after the caesarean section delivery and the studies failed to calculate the long term cost related to caesarean section. The majority of the study did not follow the scientific method of cost of illness study, which consequently resulted into a lack of robustness of the analysis.

The technical characteristic of the articles show several limitations. The studies lack the costing information on different type of caesarean section delivery. Most of the studies did not mention the costing procedure as the costing study should follow the fundamental rules of identification, measure and valuation. One of the fundamental rules of costing study is to stating perspective of the costing study. Most of the study did not mention this perspective directly. However, it has been mentioned in some of the studies indirectly. In some cases, all costs items have not been identified, which underestimates the actual cost of illness. Usually, the studied did not measure the cost of volunteer time. Accompany the women during their delivery is very common in Bangladesh and they forgo their income during that time. Unfortunately most of the study did not measure this lost earnings. Most of the study did not do any analysis about generalizability of their findings in the country and elsewhere. In general, the less technical issues are targeted by most of the study. Hoque ME et al(2011) mentioned the

exclusion of various important cost components among the Bangladeshi articles [16]. They also mentioned that there may have lack of guideline for costing method.

5. Conclusion

The capacity building on cost of illness analysis among the researcher in Bangladesh is required. This is needed as the cost of illness study done in most of the study retrieved here is not complete and the quality of the data collection method and analysis is poor. Further research is required, particularly in primary costing studies of caesarean section delivery in Bangladesh following the proper costing instruction based on standard cost of illness study guideline. Because of the interaction between socio economic status and outcome, costing studies should include specific analysis of the rural women and also women from hard to reach areas. A comprehensive costing analysis including out of pocket expenditure of the household due to caesarean section delivery, their source of financing and long term economic consequences of caesarean section delivery should be undertaken.

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