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HEALTH EXPENDITURE ANALYSIS IN PATIENTS WITH PREGNANCY-LABOR COMPLICATIONS IN SURABAYA

Analisis Pengeluaran Biaya Kesehatan Pada Penderita Komplikasi Kehamilan-Persalinan di Kota Surabaya

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Abstract

Background: Healthcare spending has serious social and economic consequences for familie, such as financial constraints and psychological distress. Expenditure caused by obstetrics complications has an impact on total household spending. One person's health expenditure can influence their family members' welfare.
Aims: This study analyzed health expenditure of patients experiencing preeclampsia, eclampsia, and postpartum hemorrhages.
Methods: This study utilized a descriptive observational research design with a cross-sectional approach. The research sample consisted of 135 women who gave birth in November to December 2018. Multistage random sampling was used since the respondents were selected from regions of Surabaya.
Results: Respondents of pregnancy and delivery complication with catastrophic health expenditure was eclampsia suffered by 40 respondents, 71 respondents with medium income financing Rp3,800,000.00, 64 respondents with medium household expenditure (monthly income of Rp2,001,000.00 - Rp3,000,000.00). As many as 62 respondents had social security agency for health without contribution beneficiaries, 62 respondents had one employed family member, and 66 respondents had 5-7 family members.
Conclusions: The majority of respondents in Surabaya in 2019 experienced a 10% increase of total household expenditure while undergoing treatment. The government continues to increase subsidies for health service facilities that mostly serve the indigen population.

Keywords: eclampsia, hemorrhagic, health expenditure, preeclampsia

Abstrak

Latar Belakang: *Pengeluaran kesehatan memiliki konsekuensi sosial dan ekonomi yang serius bagi keluarga seperti kesulitan keuangan dan tekanan psikologis. Pengeluaran akibat kesehatan untuk satu anggota keluarga dapat mempengaruhi kesejahteraan anggota keluarga lainnya.*
Tujuan: *Tujuan penelitian ini adalah menganalisis pengeluaran biaya kesehatan pada penderita komplikasi kehamilan-persalinan.*
Metode: *Desain penelitian ini adalah observasional deskriptif dengan pendekatan studi potong-lintang. Sampel penelitian yaitu 135 ibu yang melahirkan pada bulan November-Desember 2018. Pengambilan sampel secara sampling acak bertingkat di kota Surabaya.*
Hasil: *Penderita komplikasi kehamilan-persalinan yang mengalami pengeluaran biaya kesehatan luar biasa adalah sebagian besar penderita yang mengalami eklampsia sebanyak 40 responden, penderita dengan pendapatan sedang (Rp3.800.000,00) yaitu sebanyak 71 responden, penderita dengan pengeluaran rumah tangga dalam kategori sedang (Rp2.001.000,00 – Rp3.000.000,00) yaitu sebanyak 64 responden, penderita dengan jenis pembiayaan non PBI sebanyak 62 responden, penderita dengan jumlah angggota keluarga yang bekerja sebanyak 1 orang yaitu sebanyak 62 responden, dan penderita dengan besar anggota keluarga sebanyak 5-7 orang yaitu sebanyak 66 responden.*
Kesimpulan: *Sebagian besar responden di Kota Surabaya tahun 2019 mengalami peningkatan biaya pengeluaran kesehatan>10% dari total pengeluaran rumah tangga selama menjalani masa perawatan. Pemerintah hendaknya meningkatkan subsidi untuk sarana pelayanan kesehatan yang banyak melayani penduduk miskin.*

Kata Kunci**:** *, eklampsia, pengeluaran biaya kesehatan, preeklampsia*

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Introduction

According to the World Health Organization, global maternal mortality rates have still been very high. Every day, about 810 women die from complications during pregnancy or childbirth worldwide (WHO, 2019). It has been estimated that about 295.000 women died in 2017 during pregnancy and childbirth, even though maternal mortality rates worldwide fell by 38% between 2000 and 2017. Almost all maternal deaths (94%) occur in developing countries. The maternal mortality rate in developing countries in 2017 was 462 per 100,000 live births, while, in developed countries there were 11 deaths per 100,000 live births. The pregnancy or childbirth complications that cause almost 75% of all maternal deaths in the world are heavy bleeding (mostly postpartum), infections (usually postpartum), high blood pressure during pregnancy (pre-eclampsia and eclampsia), and complications of labor (WHO, 2019). Indonesia is a developing country with a high maternal mortality rate. In 2015, the maternal mortality rate in Indonesia was 305 per 100,000 live births. Indonesia is still far from reaching the Millennium Development Goals (MDGs) target which aims to reduce maternal mortality to 102 per 100,000 live births.

The Indonesian Health Profile data (2017) has shown several provinces and districts with high maternal mortality rates, namely North Sumatra, Banten, West Java, Central Java, East Java, and South Sulawesi. East Java province is one of the provinces with the highest maternal mortality rate in Indonesia. One of the regions in East Java with the highest maternal mortality rate is Surabaya. In 2017, the number of maternal deaths reported in Surabaya was 34 cases. This was the highest number of cases compared to other districts and cities in East Java (Indonesian Ministry of Health, 2017).

The maternal mortality rate in Surabaya in 2016 and 2017 did not reach the Sustainable Development Goals (SDGs) target of 70 per 100,000 live births. In Surabaya, most maternal mortality rates are caused by complications during pregnancy and childbirth. Data from the Surabaya District Health Office in 2016 and 2017 have shown the causes of maternal deaths in Surabaya were bleeding, preeclampsia / eclampsia, infection, heart disease, HIV, pulmonary TB, and hepatitis among others. It is consistent with World Health Organization's states that the maternal mortality rate is mostly caused by complications during pregnancy and childbirth.

Maternal death in Surabaya is mostly caused by preeclampsia / eclampsia. Data from the Surabaya City Health Office have shown the number of preeclampsia cases in pregnant women in Surabaya for the last three years has increased consecutively. The number of cases of preeclampsia increased significantly from 1.145 cases in 2015 to 1.658 in 2016. The highest number of cases in 2017 occurred in the Krembangan Sel Primary Health Center with 298 preeclampsia patients followed by the Pucang Sewu Primary Health Center with 294 preeclampsia patients.

According to Kes *et al.* (2015) the cost for health care services that deal with complications and maternal mortality is significantly higher. This is caused by high-cost health care services incurred for antenatal care. Additionally, there is an increase of expenditure during the postpartum stage and referral to health services with higher cost. Families whose family members experienced complications or passed away spent about a third of their annual consumption per capita on health expenditure. Expenditure for easy access to health services consumed about 12% of household expenditure.

To overcome pregnancy complications and reduce the maternal mortality rate, mostly caused by complications of pregnancy or childbirth, the government has provided health protection, including labor insurance to minimize health expenditure. In 2014, the government implemented national health insurance with the principle of social insurance which aimed to guarantee comprehensive health services for Indonesians in accordance with their health needs, and achieve universal health coverage in 2019 (Laksono *et al.*, 2017).

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The Indonesian Ministry of Health states that health expenditure is the amount of funding required to obtain various health services for individuals or families. Cost is always an important consideration due to the lack of funds. Generally, costs related to health care are categorized into four types: 1. Direct medical cost which is the cost used directly for health services including the cost of drug, physician visits, laboratory tests, and informal services. 2. Direct non-medical cost which is the cost not directly associated with medical care, such as transportation and accomodation. 3. Indirect cost which is the cost incurred from the decrease of productivity, for example, patients or other family members who cannot go to work. 4. Intangible cost; the costs that are difficult to measure in monetary units, but are seen in measurements of quality of life such as pain and anxiety suffered by patients or their families (Laksono *et al.*, 2017).

According to Hoque *et al.* (2012), the economic consequences of maternal complications can be felt in several ways including an increase in indirect expenses for medical care, which can increase planned household expenditure. Furthermore, poor health can lead to loss of labor and, as a result, reduced household income. Any expenditure due to maternal complications has an impact on the total household expenditure. This is consistent with the results of a study conducted by Dalaba *et al.* (2015) which states that several factors, including costs, constrained the utilization of health facility services for pregnant women. This study has shown that even mothers with pregnancy complications who do not incur medical care costs, bear other expenses that even exceed medical expenses, such as transportation, food and drink, and lodging. These expenses affect the circulation of family financial arrangements which can become an economic burden and affect the welfare of other family members.

According to Aregbeshola and Khan (2018), catastrophic health expenditure must be handled by state policies concerning the health system. Catastrophic expenditure is used as an indicator to assess the performance of a health system of health funding. Families living in or around low-income areas are impoverished when the government does not pay attention to catastrophic health expenditure. The Law of the Republic of Indonesia Number 44 of 2009 Chapter IV Article 6 Verse 1 Point B states that the government and local government are responsible for guaranteeing financing of health services at hospitals for the destitute or needy people (Laksono *et al.*, 2017).

According to Cylus, Papanicolas and Smith (2017), if a household member gets sick, out of pocket medical care payment will disrupt standard domestic life material. If health care costs are relatively larger than the available household resources, then it will disrupt the standard of living which can be regarded as a catastrophe. One of the concepts of justice in health financing is every household must be protected against catastrophic medical expenses.

According to Nastiti (2011), there are prospective socioeconomic impacts because of the high treatment cost and the effect of disability inflicted on patients after treatment. Patients have experienced depression or incredible pressure because of mobility limitations which can deeply affect the psychological functions of the sufferers (Nastiti, 2011). Cost distribution is important to analyze because, in any incident, direct and indirect costs incurred will have long-term significance in terms of the economic burden. Patients generally understand that direct costs will be covered by the Social Security Agency for Health (*BPJS Kesehatan*) or insurance and indirect costs will be covered by patients. However, there has been no analysis of indirect costs. Knowledge about indirect costs matters because losses will be endured by patients, and costs may not immediately present nor can they be predicted, and tend to be more expensive than direct cost.

Based on the description above, an increase in the number of preeclampsia / eclampsia cases from 2015 to 2017 in Surabaya with an average annual increase of 16.82% were analyzed in this present study, especially in regards to direct and indirect costs which hold long-term

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significance to economic burdens of households.

Method

The current research was an observational descriptive study because there were no interventions affecting the subjects of the study. The design of this research was cross-sectional, meaning that data collection of the disease and exposure disease of the population was carried out at a specified time. The research took place at respondents' homes in Surabaya. The study was done from November 2018 to October 2019.

The population in this study consisted of preeclampsia, eclampsia, and hemorrhage patients in Surabaya. The patients selected had given birth between October 2018 and December 2018. The sampling process was done through multistage random sampling, meaning that the research subjects were divided into groups or clusters. Then, research samples were chosen randomly. This sampling method made it possible to determine random sub-sampling from the clusters.

This study consisted of 473 individuals, divided into 5 regions: North Surabaya, Central Surabaya, West Surabaya, South Surabaya, and East Surabaya. The samples in stage I were the chosen local primary healthcare centers, determined randomly in each region. The next step was determining samples for stage II, which consisted of selected households from the local primary healthcare centers chosen in stage I. The number of chosen households in each primary healthcare center was determined based on the prevalence of every region and distributed in accordance with the criteria of samples required. If the area did not meet the number of samples required, then the samples were taken from other local primary healthcare centers.

The number of samples in each category (pre-eclampsia, eclampsia, and postpartum hemorrhage) was divided proportionally with 45 for each category. The samples in each category were then chosen randomly.

Table 1. Frequency Distribution of respondents' Characteristics in Surabaya in 2019.

Category	n	%
Age		
Early Adolescent (12-16)	0	0
Late Adolescent (17-25)	15	11.1
Early Adulthood (26-35)	111	82.2
Late Adulthood (36 > 45)	9	6.7
Education		
Elementary school	12	8.9
Junior high school	22	16.3
Senior high school	76	56.3
Diploma/ Bachelor	25	18.5
Job		
Unemployeed	58	43
Civil Servant	7	5.2
Private Employee	45	33.3
Self-employed	25	18.5
Number of Working Family Members		
1 Person	65	48.2
2 People	62	45.9
3-4 People	8	5.9
Family Members		
2-4 People	51	37.8
5-7 People	82	60.7
8-9 People	2	1.5
Type of Payment		
Social Security Agency for Health with Contribution Beneficiaries	55	40.7
Social Security Agency for Health without Contribution Beneficiaries	77	57
Other insurance	3	2.3
Income		
Low (Rp2,500,000–Rp3,799,000)	13	9.6
Medium (Rp3,800,000)	75	55.6
High (Rp3,800,001–Rp7,000,000)	47	34.8
Household expenditure		
Low (Rp1,000,000-Rp2,000,000)	35	25.9
Medium (Rp2,001,000–Rp3,000,000)	68	50.4
High (Rp3,000,001–Rp5,750,000)	32	23.7
Total	135	100

Result and Discussion

Characteristics of respondents

Respondents' characteristics in this study include age, education, job, number of family members, number of working family members, type of payment, family income, and household expenditure can be seen in Table 1.

Table 1 shows that 111 respondents (82.2%) in this study were classified as in early adulthood (26-35 years). In terms of education, it can be seen that 76 respondents (56.3%) graduated from high school. In terms of occupations, it can be seen that 58 respondents (43%) were

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unemployed (house wives). Moreover, the respondents mostly had one working family member (65 respondents or 48.2%).

In terms of the number of individuals in respondents' households, it can be seen that the number of family members was around 5-7 members (82 respondents or 60.7%). The payment mostly used was insurance. Most of the respondents were enrolled in non-contribution beneficiaries' programs set by the Social Security Agency (BPJS) (77 respondents or 57%), while the rest were enrolled in private insurance.

The respondents' income was calculated from monthly income. Based on income, it shows that the respondents mostly had the medium income equal to Surabaya's minimum wage of Rp3,800,000.00. The highest income reported from the respondents was Rp7,000,000,00 and the lowest income reported was Rp2,500, 000.00.

The expenditure mentioned in this study was monthly expenditure. The results show that family expenditure fell mostly in the category (Rp2,001,000.00 – Rp3,000,000.00). The smallest expenditure was Rp1,050,000.00 and the largest was Rp5,750, 000.00.

Direct and Indirect Cost of Health Care

Direct costs of health care incurred were seen in the payment of health insurance that paid every month with category ≤ Rp100,000.00 and > Rp100,000.00 Indirect costs were expenditure for health care costs for consumption, transportation, and productivity-loss costs.

This study shows that the direct costs incurred for health care services were mostly in the category of ≤ Rp100,000.00 (118 respondents or 87.4%). The remaining 17 respondents (12.6%) got paid for direct costs in the category of > Rp100,000.00. The smallest amount of direct costs incurred was Rp25,000.00 while the largest amount was Rp750,000.00

The cost of daily consumption (eating, drinking, etc.) during hospitalization incurred by 71.9% of the respondents (97 respondents) was around Rp15,000–Rp50,000, while 28. 1% of respondents incurred Rp50,001–Rp100,000. The largest expenditure incurred was about Rp90,000, while the smallest expenditure incurred was Rp15,000. Transportation costs are indirect costs incurred for vehicle rentals and gasoline purchases. It was found that the transportation cost spent by 85% of the respondents (115 respondents) was around Rp40,000.00–Rp100,000.00 while 14.8% (20 respondents) spent about Rp100,001.00–Rp165,000.00.

The largest expenditure incurred was Rp165,000.00 while the smallest expenditure incurred was Rp45,000.00. Productivity-loss costs are indirect costs incurred because of fulfilling treatment for sick family members. The costs were divided into Rp100,000.00– Rp200,000.00, Rp201,000 – Rp300,000, Rp301,000 – Rp400,000, and larger than Rp400,000. The productivity cost incurred by most respondents (63 respondents or 46.7%) was in the category of Rp301,000–Rp400,000. The least number of respondents had a productivity cost of Rp100,000 – Rp 200,000 (15 respondents or 11.1%). The largest expenditure incurred was Rp400,000, while the smallest expenditure incurred was Rp90,000. According to Hussey, Wertheimer and Mehrotra (2016), cost is always an important consideration because of limited funds. Costs are calculated to estimate the resources for a service. In general, costs are associated with health care. The types of health costs include direct costs and indirect costs. Direct costs are related to medical services and are used directly for health care expenditure, including drug costs. Indirect costs are caused by lost productivity due to illnesses experienced by patients, for example, decreased productivity at work and time loss to receive care, as well as companion costs (family members who took care of patients). Distribution of disease suffered based on direct and indirect costs Cross-tabulation between diseases of patients and types of costs can be seen in Table 2.

Table 2 shows that in the direct costs category, 100% of the respondents (45 respondents) with preeclampsia and eclampsia spent ≤ Rp100.000. Meanwhile,

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62.2% of the postpartum hemorrhage respondents (28 respondents) spent ≤ Rp100.000, while the remaining 17 respondents spent > Rp100.000.00 spent Rp460,001.00–Rp560,000.00 for indirect costs.

The results of this study indicate that the respondents not only had to pay direct treatment costs to receive medical services in accordance with the rates of Social Security Agency for Health or other insurances, but also had to incur additional costs such as transportation, daily life expense, the cost of decreased productivity, and companionship costs. The accumulated costs during the treatment period will generate a high cost burden for patients, especially for patients with lower incomes.

This is consistent with a study by Aulia, Ayu and Nefonafratilova (2017) who have shown that the transportation costs incurred to bring patients to the hospital and back home was Rp 125,000 per patient. The total cost of purchasing daily necessities as family care costs was Rp 100,000 per day. This shows that indirect costs increase with time spent during the hospitalization. The increase in indirect costs is also related to the loss of income due to unemployment.

According to Dalaba *et al.*, (2015), most direct medical costs were incurred outside the hospital because of shortage/non-availability of prescribed drugs or non-availability of equipment. For instance, two years preceding the survey, the Navrongo Hospital operated without an ultrasound scan available. As a result, women had to obtain their scans from private sources, which needed additional costs. The median transportation cost was $13.48 (IQR = 16.05) per person (patient and person accompanying the patient) representing 32% of the total cost. The majority of respondents (37%) were transported to the hospital with official vehicles of the primary healthcare center. The respondents reported paying between $11 and $13 to fuel the vehicle to the referral point. The median expenditure made on food for both patients and caretakers was estimated at $9.47 (IQR = 14.21) per person. In addition, the median indirect cost attributed to productivity losses was estimated at $5.2 (IQR = 8.27) per person.

Catastrophic Health Expenditure

According to Wagstaff and Doorslaer (2002), threshold was inevitably a matter of choice, and a range of 2.5%-15% of total expenditure and 10%-40% of ability to pay can be chosen for use in defining catastrophic health expenditure. According to Doorslaer and O'Donnell, (2011), the concept of catastrophic payments has been put into operation by defining them as occurring once OOP payments cross some threshold share of total household expenditure. While it is acknowledged that the choice of threshold is arbitrary, 10% of total expenditure has been a common choice (Wagstaff and Doorslaer, 2001).

Table 2. Distribution of Disease Suffered Based on Direct and Indirect Costs in Surabaya in 2019

Cost (Rp)	Diseases Suffered					
	Preeclampsia		Eclampsia		Postpartum Hemorrhage	
	n	%	N	%	N	%
Direct Cost						
< 100.000	45	100	45	100	28	62.2
> 100.000	0	0	0	0	17	37.8
Indirect Cost						
160,000 – 260,000	4	8.9	0	0	0	0
260,001 – 360,000	7	16.6	1	2.2	1	2.2
360,001 – 460,000	17	37.8	5	11.1	8	17.8
460,001 - 560,000	17	37.8	39	86.7	36	80.0
Total	45	100	45	100	45	100

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Table 3. Distribution of Catastrophic Health Expenditure in Surabaya in 2019.

Category	Catastrophic				Total	
	Catastrophic		Non-Catastrophic			
	n	%	n	%	n	%
Disease suffered						
Preeclampsia	38	84.4	7	15.6	45	100
Eclampsia	40	88.8	5	25.0	45	100
Postpartum Hemorrhage	37	82.2	8	17.8	45	100
Income						
Low (Rp2,500,000 – Rp3,799,000)	13	100	0	0	13	100
Medium (Rp3,800,000)	71	94.7	4	5.3	75	100
High (Rp3,800,001 – Rp7,000,000)	31	66	16	34	47	100
Household Expenditure						
Low (Rp1,000,000 – Rp2,000,000)	35	100	0	0	35	100
Medium (Rp2,001,000 – Rp3,000,000)	64	94.1	4	5.9	68	100
High (Rp3,000,001 – Rp5,750,000)	16	50	16	50	32	100
Payment						
Social Security Agency for Health with Contribution Beneficiaries	50	90.9	5	9.1	55	100
Social Security Agency for Health without Contribution Beneficiaries	62	80.5	15	19.5	77	100
Other Insurance	3	1.0	0	0	3	100
Number of working family members						
1	62	95.4	3	4.6	65	100
2	51	82.3	11	17.7	62	100
3-4	2	25	6	75	8	100
Number of family members						
2-4	48	94.1	3	5.9	51	100
5-7	66	80.5	16	19.5	82	100
8-9	1	50	1	50	2	100

Some analysts assume that a cost burden greater than 10% is likely to be catastrophic for the household economy indicating household members will likely need to cut consumption of other basic needs, trigger productive asset sales or high levels of debt that lead to impoverishment (Russells, 2004). This study refers to the study conducted by Russells (2004) using catastrophic thresholds, i.e. 10% of the total household spending categorized as catastrophic health expenditure (CHE). CHE can be seen from the expenditure of direct and indirect health costs compared to household expenditure. This study shows that almost all respondents (115 respondents or 85.2%) experienced an increase in household expenditure of more than 10% during the treatment period.

Distribution of catastrophic health expenditure

Cross tabulation of CHE based on disease suffered, family income, household expenditure, types of payment, number of working family members, and number of family members can be seen in Table 3.

Table 3 shows that catastrophic health expenditure was experienced the most by 40 eclampsia respondents (88,8%), followed by preeclampsia and hemorrhage patients (84.4% and 82.2%). According to Wiseman et al., (2018), the population must be protected by the state from catastrophic health expenditure through the implementation of health system policies. This catastrophic expenditure is used as an indicator for assessing the performance of a health system in health funding in addition to equity (regressive or progressive) (Aregbeshola and Khan, 2018). The destitute or nearly destitute patients will be further impoverished or fall into poverty if the government does not address catastrophic health expenditure.

Overall, 115 respondents (85.2%) experienced catastrophic health expenditure. In the category of income, catastrophic health expenditure was experienced most by the respondents with medium income (Rp 3,800,000), as 71

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respondents (94.7%) experienced catastrophic health expenditure. This was followed by high- and low-income respondents (31 and 13 respondents, respectively). The increase in maintenance costs in this study mostly occurred in the respondents with moderate income. This suggests that patient and family income will affect the family's ability to finance health care expenses associated with preeclampsia, eclampsia and postpartum hemorrhage. The higher the income, the more likely respondents can fulfill maintenance financing needs, and vice versa.

Aulia's research (2017) supports the current research, in which patients with long hospital stays will bear indirect expenses such as transportation costs and consumption costs. Respondents with low family income increase the burden on family expenses resulting in higher treatment costs during the treatment period. Respondents tend to spend additional expenses as an economic burden, namely treatment costs for family members suffering from preeclampsia, eclampsia, and postpartum hemorrhage (Aulia, Ayu and Nefonafratilova, 2017).

In the category of household expenditure (Table 3), catastrophic health expenditure was experienced most by respondents with medium household expenditure (94.1%), followed by respondents with low and high expenditure (35 and 16 respondents, respectively). This is consistent with the results of Sihombing's study (2013), which showed that the average medical expenses of patients was Rp236,278, while the highest medical expense was Rp904,000 and the smallest medical expense was Rp46,500. Medical expenses incurred by these patients include service registration fees (including doctor fees), drug costs, laboratory costs, x-ray costs, and electrocardiogram (ECG) costs. Meanwhile, the average non-medical expenditure per month was Rp1,696,069. The highest non-medical expenditure was Rp3,750,000, while the smallest non-medical expenditure was Rp690,000. The amount of non-medical expenditure was calculated based on the amount of costs incurred by households per month for food needs and non-food needs, including costs for education, electricity, water, telephone, transportation, social gathering, and cigarettes (Sihombing and Rochmah, 2013).

The aforementioned research supports the results of this study, showing the respondents with moderate expenditure increased household expenses because the additional costs forced them to reduce other daily expenses such as education, electricity, telephone, and consumption costs. This emphasis may impact the pattern of expenditure. Respondents who could not manage their spending properly experienced higher family expenses, especially during the treatment period.

In the category of payment, catastrophic health expenditure was experienced most by respondents without contribution beneficiaries (80.5%) experiencing catastrophic health expenditure. The second most common payment was with contribution beneficiaries followed by other insurance (50 and 3 respondents, respectively). Out of the patients using non-contribution beneficiaries payment, 62 respondents (80.5%) experienced catastrophic health expenditure, and 15 respondents (19.5%) experienced non-catastrophic health expenditure.

Firmansyah, Andayani and Pinzon (2016) have found that the treatment class yielded different results ($p < 0.05$). There was an increase in the number of patients with class III, class II, and primary care. However, there was no increase in treatment class I. The present study indicates that the respondents with contribution beneficiary status did not significantly increase household expenses because they did not pay monthly medical expenses and respondents with non-contribution beneficiaries increased household expenses because they had to pay monthly insurance contributions.

According to Dalaba *et al.* (2015), although, officially, maternal health services are free in Ghana, women in need of emergency obstetric care in formal health care facilities incur substantial costs and face the risk of incurring catastrophic health expenditure. The current health

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system which implements the free maternal health service policy is necessary, but not sufficient in reducing the economic burden of maternal complication treatment costs and providing adequate financial protection to households. Enacting a policy without providing a supportive environment to maximize the outcomes puts a dent on the health system.

Regarding working family members, catastrophic health expenditure was experienced most by respondents with one working family member (95.4%), followed by respondents with 2 and 3-4 working family members (51 and 2 respondents, respectively). The results of Sihombing's study (2013) show that while patients who did not experience catastrophic payments were family heads working as entrepreneurs and private employees (30.4%). Most of the families (69.6%) had high income. Wiseman *et al.*, (2018) states that middle-income groups have 10 times the risk of falling into poverty than high-income groups. Middle-income households do not experience excessive burden on household expenses. However, when a family member falls ill, the situation forces them to set aside non-medical expenses for medical purposes. Sihombing's research (2013) supports the results of this study that indicated unemployed respondents procured less family income than employed ones. Undergoing a period of treatment for diseases such as preeclampsia, eclampsia, and postpartum hemorrhage will increase the burden on household expenses. After the respondents got sick, the burden of household expenses was not bearable.

Observed from the number of family members, catastrophic health expenditure was experienced most by respondents with 5-7 family members (80.5%), followed by respondents with 2-4 and 8-9 family members (48 respondents and 1 respondent, respectively). The results of this study are relevant with Nugraheni and Hartono's research (2017) stating that households with many members were more likely to have high health spending.

Government efforts to reduce the economic burden of the healthcare cost will be able to handle the problem of poverty in the community. One of the efforts can be carried out more intensively is health promotion activities through health centers, pustu or polindes so that it can provide additional information or insight to the community, especially for pregnant women and their families in maintaining maternal health.

Conclusion

The results of this study indicate that there was an increase in household expenses due to treatment costs of pregnancy, childbirth, or puerperium complications. The increase in household expenditure was more pronounced in respondents who had income equal to or below the regional minimum wage as household expenses increased during treatment. The most catastrophic health expenditure occured in patients with moderate income (Rp 3,800,000) (94.7%). Only 4 respondents (5.3%) experienced non-catastrophic health expenditure. Moreover, if one family has more than 4 members, it will result in an increase in family expenses as shown in Table 5. The largest catastrophic health expenditure occured in patients with 5-7 family members (80.5%), while 16 respondents (19.5%) with the same number of family members experienced non-catastrophic health expenditure.

Families experiencing eclampsia, preeclampsia and postpartum hemorrhage had their family welfare affected because of the additional household expenses, while family income did not increase. Increased economic burden of households affect the burden of living and social conditions of the community after the treatment process. Respondents who could afford the cost could continue with daily activities as usual, but those who could not afford the cost after undergoing treatment experienced higher expenses and family economic conditions.

Government efforts to reduce the economic burden of healthcare costs will be able to handle poverty in the community. One of the efforts that can be carried out more intensively is a health promotion agenda through healthcare centers, auxiliary primary healthcare centers, or village maternity clinics to provide

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additional information of maternal health to the community, especially for pregnant women and their families.

Abbreviations

MDGs: Millennium Development Goals; WHO: World Health Organization; SDGs: Sustainable Development Goals; BPJS: Badan Penyelenggara Jaminan Sosial (Social Security Agency); CHE: Catastrophic Health Expenditure.

Declarations

Ethics Approval and Consent Participant

This study has been approved by the Commission on Research Ethics, Faculty of Dentistry Universitas Airlangga with No. 073/HRECC.FODM/III/2019.

Conflict of Interest

The authors declare that there are no personal interests that might have affected the performance.

Availability of Data and Materials

The availability of data and materials based on demand from journals and readers.

Authors' Contribution

E conceptualized the study; E created the methodology; E and DS wrote, reviewed, and edited the manuscript; E and DS wrote the original draft.

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