Cost Burden for Accessing Paediatric Emergency Services at a Tertiary Health Facility

Type of Article: Original

Daprim Samuel Ogaji, Odadi Christian Mark, Etakewen Paul Oghenetega, Ugwu Godwin Ebebechukwu, Margaret Mary Mezie-Okoye

Department of Preventive and Social Medicine, University of Port Harcourt Choba, Nigeria.

ABSTRACT

BACKGROUND

The economic burden of seeking paediatric emergency care could be high and this could also negate the philosophy of equity, social justice, universal access and social health protection for all. This study assessed the cost, payment modalities and economic impacts for accessing paediatric emergency services in a tertiary hospital in Nigeria.

METHODS

Cross sectional survey with pre-tested structured questionnaires administered by trained interviewers to158 parents of children discharged from a tertiary hospital emergency unit over a 2-month period. Verifiable information on various financial expenditures during emergency episode as well as respondents' perceptions and background socio-economic status were collected. Proxy estimates for economic impacts were calculated based on single need per household for emergency care. Descriptive analysis of the data was done using SPSS version 20.

RESULT

Majority (45.6%) of the 158 children were aged 1 - 5years, girls (52.5%) and were diagnosed with single morbidity (86.7%). Primary diagnoses were bronchopneumonia 21.5%, diarrhoea disease 20.9% and malaria 14.6%. The major contributors to cost of healthcare were the cost of admission and drugs. Payment at the point of access to healthcare was almost universal (98.7%). Study shows that41.8% and 52.5% of households spent more than 40% of their monthly non-food and 50% of their monthly non-subsistent earnings on the index paediatric emergency.

CONCLUSION

The cost of accessing paediatric emergencies could put a high proportion of uninsured households at risk of being impoverished. Findings provide further imperative for the intensification of efforts at scaling up of the social insurance scheme to cover all household as a means of assuring social health protection for all.

KEYWORDS

Cost; Paediatric Emergencies; UPTH; Children; Rivers State; Nigeria.

Correspondence: Dr DS Ogaji
Email: daprim.ogaji@uniport.edu.ng

INTRODUCTION

Children's health status is a vital index for assessing societal development and paying attention to their health needs can contribute to a remarkable increase in the overall health status of the population[1,2]. Regrettably, millions of children who are in need of essential education, health and protective services globally are frequently overlooked under many on-going development programmes[3].

Common medical emergencies of children in Nigeria include malaria, bronchopneumonia, bronchiolitis, meningitis, low birth weight, birth asphyxia, diarrheal disease, protein energy malnutrition and febrile convulsion[1,2]. In the event of these resulting in emergency situation, the typical outcomes following such emergency admissions in hospitals range from being discharged home from the emergency unit to referral to other facilities; transfer to wards in same hospital; death of the child or in a few occasions, self-discharge where parents sign to leave the hospital against medical advice[2].

In Nigeria, like many less developed countries, resource shortages in public health systems have led to the establishment of cost recovery measures for health commodities[4]. Possible solutions to the perennial problem of financing gaps for health service provisions have been a constant debate in Africa for a while. For example, the Bamako initiative aimed at strengthening health care delivery through community financing and participation in the management of local health services[5,6] was at the time seen as an innovation solution to financing health care at least for the most vulnerable. A prominent sequel a of this initiative was the introduction of users' fee for patients attending public health facilities. More often than not, these users' fees are demanded at the point of access to health care and are at least expected to cover the cost of health commodities which are affected by inflationary trends[7]. Also, where demand for health care outstrips supply in public domain, patients are also expected to purchase care even at the higher costs offered in private health facilities. Thus, in the event of an adverse health condition, families are faced with the hard choice of whether or not to seek health care and the amount of care they can receive may depend on the cost of the care and how much they can afford to pay. This trend may lead to more fragmentation of care, receipt of poor quality care and inequitable access to basic health services.

Healthcare costs can be classified into direct medical, direct non-medical costs, indirect costs and total costs[8].The scope of user fee is quite variable and may include any combination of transportation, purchase of registration card, drug cost, laboratory investigation, consultation fees and admission cost[7,9]. Out-of-pocket payment for health services at the point of access is the preponderant mode of payment for health services in Nigeria[10]. This situation had persisted because the National Health Insurance Scheme created since 1999 still has as low enrollees strength of about3% of the Nigerian population and these are mainly federal civil servants[11]. The high prevalence of user fee as well as the poor coverage of social health insurance in Nigeria could have negative economic impacts on citizens and negatively influence the outcomes of healthcare especially when prompt attentions are not received.

Timely access to hospital care in the event of an emergency can improve child survival[12]. However, the dilemma of balancing health risk and economic cost as stated earlier, may impose some restrictions in seeking care especially for vulnerable populations like children. Previous studies have examined the cost of managing specific childhood communicable and non-communicable conditions in hospital settings[12-14]. However, this study aims to provide a useful addition to the existing literature by investigating the cost and economic consequence for those accessing emergency paediatric services in a public tertiary health facility in Nigeria.

METHODS

Study facility

The University of Port Harcourt Teaching Hospital (UPTH) is a Tertiary hospital in Obio-Akpor Local Government Area of Rivers State, Nigeria. It is managed through a three-tier managerial structure comprising – the Board of Management, hospital management committee (HMC) and the various service departments which deliver primary, secondary and tertiary services to its

catchment population in Rivers and the environs. The paediatric emergency unit of the hospital is under the paediatric department and attends to all emergency cases referred from other health facilities or children with severe illness who are brought directly from their homes to the hospital. The emergency unit is opened 24 hours daily throughout the week. Being fee paying, children are expected to be accompanied by adults who usually bear financial responsibilities for payments for services provided. Payments are often expected to be made before the services are delivered unless where families are enrolled in any of the existing pre-payment schemes.

Study population: Participants were parents of children that were discharged from the paediatric emergency unit during the period of this research. We included only those whose children were admitted and discharged from this unit and excluded those whose children died while on admission; were later transferred to the wards for continuing care; self-discharged from the facility and those that declined consent to participate.

Study design: A cross-sectional descriptive study.

Sample size: Appropriate sample size of 174 was determined using a formula for calculating sample size for prevalence studies and giving due consideration to size of the study population (<10,000) and the possibility of non-response:

$$N = {Z_{\alpha}^{2}P(1-P)}/{d^{2}}$$

Where N is the sample size, Z_?is the standard deviation of the proportion at 95% confidence level which is equal to 1.96. P (83%) represented the proportion of cases of children admitted and discharged home from the emergency unit in a previous study in Nigeria2, while d is the precision of 5% considered in this study.

Sampling method: Consecutive patients recommended for discharge by the attending pediatricians were recruited if they met the eligibility criteria and gave their consents to participate in the study.

Study instrument: A data extraction sheet was used to collect information from the hospital records of study participants. Also pre-structured self-administered questionnaire was used to retrieve information on the various socio-demographics, expenditures and earnings of the participants who were representatives of households. Audit trail of expenditures on transportation to the facility, registration, investigations, admission, and drugs for index emergency episode was carried out.

Study procedure: Questionnaire was pretested with 25 respondents at the paediatric emergency unit of a similar tertiary health facility (Braitwaite Memorial Specialist Hospital). Necessary revisions were effected before it was used in the main study. Parents whose children had been discharged home from the unit were approached by members of the research team and given information about the research and assurance of confidentiality before verbal consents were given. Prior approval for this study was also sought and given by the head of the paediatric department. Data was collected between February and March 2015 and records of children admitted into the children emergency wards on account of the different emergencies were also reviewed

Data analysis: Data management was done with the Statistical Package for Social Sciences (SPSS) version 20.0(17). Descriptive analysis of the data collected were presented in tables.

The household income from all sources was used to determine the socio-economic status (SES) of participants. This is considered more stable to determine in financial terms and preferred to respondents' assets such as possession of lands, houses, or household equipment/furniture. The household average monthly food expenditure was collated and adding this to other needs such as housing,

transport, fees and levies formed cost of subsistence. Reported cost of health care were the direct medical cost and potential economic impact of this cost were calculated after carefully deducting monthly expenditures on food and entire subsistence from household monthly income from all sources. Thereafter, the proportion of households who spent more than 40% of their monthly non-subsistent income or more than 50% of their monthly non-food income on the index paediatric emergency were identified. Beside indicating the level of hardship household go through to access a single paediatric emergency service, we also reported their perceptions on the various cost elements in the index visit. The official conversion rate of the naira at the time of this study was $1 ? 199 naira.

RESULTS

The response rate was 90.1% and a majority of the children were aged between 1 - 5 years (45.6%), female children (52.5%) and were yet to commence any formal education (64.6%). Similarly most of the parents who were respondents in this study were females (61.4%), in the 31 - 35 year age group (32.3%), had completed tertiary education (48.7%) and were self-employed (36.7%) were self-employed (Table 1).

The average monthly household earning from primary source was 82,367.4 naira and from all sources was 101,854.4 naira. The median size of each household was 5.0 and the average monthly household expenditure on food and non-food were 33,019 naira and 30,009 naira respectively (Table 2).

Table 3, shows the diagnostic distribution of paediatric emergencies seen at the unit. There were either single diagnosis (n = 137, 86.7%) or multiple diagnoses (n = 20, 12.7%) of which primary diagnosis was of an emergency nature while other diagnoses were either of emergency or non-emergency nature. The commonest paediatric emergency diagnosed during the study period was bronchopneumonia 34(21.5%), followed by diarrhoea disease 33 (20.9%), malaria 23(14.6%), tonsillitis 19(12.0%), meningitis 14(8.9%), febrile convulsion 5(3.2%), cardiac failure 2(1.3%) and other paediatric emergencies that are not common or occur as co-morbidity 20(12.7%). Payment at the point of access to emergency paediatric services was predominantly reported (98.7%) and the major contributors to the cost of health care were admission and the cost of medications.

The assessment of the economic implication of cost of index emergency on household finances shows the proportion of households that spent more than 50% of their non-food income or 40% of non-subsistent income on the current emergency as 58.2% and 41.8% respectively (Table 4). In most cases (n = 133, 71.6%), respondents admitted that payment for healthcare limited their ability to satisfy other essential household needs. Beyond the regular household earnings from all sources, many (n = 108, 68.4%) used loans or funds from previous savings to pay health care cost.

Table 5 shows the perception of respondents with the cost incurred on account of visiting the hospital to access emergency service for their children. Fewer respondents were at least satisfied with cost of admission (55.4%) and drugs (59.8%). than they were with other activities.

Table 1. Socio-demographic characteristics of children and parents (n = 158)

Variable	Frequency (%)
Child 's age	
Neonate	17(10.8)
Infant	47(29.7)
1-5years	72(45.6)
6-18years	22(13.9)
Child 's gender	
Male	75(47.5)
Female	83(52.5)
Child's level of schooling	
No Formal Education	102(64.6)
Primary	19(12.0)
Secondary	20(12.7)
Tertiary	17(10.8)

Parents' age (years)	
15 – 20	1 (0.6)
21 – 25	8 (5.1)
26 – 30	36 (22.8)
31 – 35	51 (32.3)
36 – 40	37 (23.4)
Above 40	25 (15.8)
Parents' gender	
Male	61 (38.6)
Female	97 (61.4)
Parents' level of schooling	
None	1 (0.6)
Primary	7 (4.4)
Secondary	73 (46.2)
Tertiary	77 (48.7)
Parents' employment status	
Unemployed	25 (15.8)
Self-employed	58 (36.7)
Work in private sector	40 (25.3)
Work in public sector	33 (20.9)
Multiple jobs	2 (1.3)

Table 2. Household monthly income and expenditure

Variable	Mean	Standard deviation	Q1	Q2	Q3
Earnings					
Primary source	82,367.4	77,521.6	35,000.0	60,000.0	90,000.0
All sources	101,854.4	100,039.5	45,000.0	70,000.0	120,000.0
Expenditure					
Food	33,019.0	18,265.4	20,000.0	30,000.0	30,000.0
Non-food	30,009.5	49,795.5	10,000.0	20,000.0	30,000.0
Size of household (median)	5.2 (5.0)	-	4.0	5.0	6.0

Table 3. Paediatric (single or multi-morbidity) emergencies, cost and payment method

Characteristics	Distribution	
Primary diagnosis	Frequency (%)	Mean cost in naira
Bronchopneumonia	34(21.5)	18, 400
Diarrhoea	33(20.9)	14, 400
Malaria	23(14.6)	15, 100
Tonsillitis	19(12.0)	13, 300
Meningitis	14(8.9)	25, 900
Bronchiolitis	8(5.1)	15, 200
Febrile convulsions	5(3.2)	16, 980
Cardiac failure	2(1.3)	29, 000
Morbidity		
Single morbidity	137(86.7)	
Multiple morbidity	20(12.7)	
*Payment methods		
Out-of-pocket (Household fund)	156 (98.7)	
Social health insurance	12 (7.6)	
Private insurance	3 (1.9)	
Support (individual or group)	16 (10.1)	
Cost across all morbidities	Mean cost in	
Transportation to facility	naira	
Registration at facility	639.1	
Laboratory investigations	482.0	
Radiological investigations	3, 130.2	
Drugs	1, 408.6	
Admission cost	6, 280.4	
Total	8, 496.6	
	18, 963.5	

*some respondents used more than 1 payment method

Table 4. Impact of cost of index emergency on household finances

Variable	Frequency (%)
Spent ⩾40% of non -subsistent income	66 (41.8%)
Yes	92 (58.2%)
No	
Spent ⩾50% of non -food income	83 (52.5%)
Yes	75 (47.5%)
No	
Health cost prevents other household needs	63 (39.9)
Yes, absolutely	50 (31.7)
Ys, partially	44 (27.8)
Not at all	
Payments with loans/previous savings	54 (34.2)
Yes, a large proportion	54 (34.2)
Yes, a small proportion	49 (31.0)
Not at all	

Table 5. Respondents' satisfaction with cost of paediatric emergencies

Aspect of service	Highly dissa tisfied	Dissatisfied	Indifferent	Satisfied	Highly satisfied
Transport cost	5 (3.2)	15 (9.6)	11 (7.0)	87 (55.8)	38 (24.4)
Registration	9 (5.7)	18 (11.5)	8 (5.1)	84 (53.5)	38 (24.2)
Laboratory	8 (5.2)	20 (13.0)	19 (12.3)	78 (50.7)	29 (18.8)
Radiology	4 (4.6)	11 (12.7)	16 (18.4)	33 (37.9)	23 (26.4)
Drugs	7 (4.5)	34 (21.7)	22 (14.0)	63 (40.1)	31 (19.7)
Admission fee	8 (5.1)	42 (26.8)	20 (12.7)	56 (35.7)	31 (19.7)
Overall cost	4 (2.6)	31 (19.7)	28 (17.8)	60 (38.2)	34 (21.7)

DISCUSSION

Our study revealed the human and diagnostic distribution of paediatric emergencies from the discharge record of a university hospital; and also examined the cost, payment modes and potential economic and psychosocial impacts of these cost on families accessing emergency care at this unit.

The study showed that the most common paediatric emergencies from the record of discharge was bronchopneumonia and then, diarrhoea and malaria. Previous reports

present malaria as the commonest cause of childhood morbidity which account for 53.6% of morbidity and also 80.3% of general paediatric hospital admissions[2,18]. Beside seasonal and geographic reasons for these hierarchical differences in the various diagnostic categories[19-21], the different spectrum of morbidities reported in both studies may also be explained by the fact that while this study considered emergency cases that were admitted, treated and subsequently discharged from the emergency unit in all children less than 18 years of age, previous studies examined general pattern of morbidity among under-fives who were admitted in hospital. However, the fact that these are all infective conditions is a pointer to the sustained high incidence of infective conditions among children in this environment and also depicts the high level of exposure to risk factors as well as poor recognition of early signs for the disease before it evolves into emergency situations[2]. The imperative is to improve health promotion activities that can empower parents to recognize and prevent risk factors for infective conditions and also seek early care which could enhance the outcome of care while simultaneously reducing the cost of health care.

Finding that most of these paediatric emergencies occurred in children between the ages 1 – 5years corroborates previous report in South-East Nigeria[1]. Both findings suggest that children under the age of five years have higher risk of coming down with severe forms of preventable conditions such malaria and respiratory tract infection that would require emergency care. This age-group could also derive the greatest benefits if household and community-based health promotion activities are stepped-up to stem this trend.

Average direct medical cost for managing paediatric emergencies from this study was 18,964 naira($95.3) with major contributors being cost for admission, purchase of drugs and radiological investigations where needed. Despite the free consultations offered the public in many government facilities, parents/guidance are expected to bear the cost of commodities consume and nursing services received by their wards during their hospital stay. These cost recovery measures are fallout of current revolving fund initiatives which were introduced to ensure that essential medical commodities are always available in the hospital[5]. There are indications that the cost of these commodities and/or services may be substantial for the beneficiaries. In fact, the mean cost of drug reported in this study was higher than what was reported in a study in Kenya[12]. It is unclear if this difference is solely the result of the Kenyan's government subsidy regime on drugs or additionally attributable to increase on the cost of these drugs in relation to the inflationary trends.

While we observed that the cost of in-patient stay exerted the greatest influence on the overall cost of accessing paediatric emergency service in this setting, drug cost was reported to be the highest contributor to the management of pneumonia in Pakistan[14]. Although the charge regime in various public health institutions in Nigeria may appear unregulated, there would be a need to review the current cost of admissions in public health facilities. This is on the background that part of the cost of running these facilities including payment of staff emoluments are drawn from public finances.

Payment for most paediatric emergencies was observed to be through out of pocket spending at the point of accessing care. The difficulty of out of pocket payment for emergency services is that it put some households in financial risk that could restricts them from having access to health care when they need it and to the desirable extent. Some families are reportedly forced to sell their assets or go into debt in order to pay for health care[22,23]. The payment modality for health care had been reported to be influenced by socio-economic and geographic factors. For example, people in higher socioeconomic groups subscribe more to pre-payment schemes for health care than those from low socioeconomic groups who often

resolve to self-medication or suffer delay in seeking healthcare[2,8,24]. A previous study on cost of managing adult long term condition in a tertiary hospital revealed that patients with lower level of education, poorer employment ranking and those from the lower wealth quartiles where significantly more likely to be affected by the cost of health care than others[7]. These social determinants are some of the drivers of inequity in access to health care especially for children who need health care services and are not protected from financial risk in resource-constrained systems[25].

We estimated economic burden of care in relation to the percentage of household disposable income spent on the index case of paediatric emergency. This is obviously an underestimate of the actual risk of household catastrophic health expenditure or impoverishment which captures all expenditures on health and thus, goes beyond the management of just a single episode of paediatric emergency. It is need full to highlight that even for such single episode of childhood emergency reported in this study, households on the average could be seen paying higher than what their counterparts are reported to spent monthly on health in Kenya[12]. The negative economic impacts of high cost of accessing paediatric emergency services on households could range from a reduction in resources for other useful activities like productive investments, education, and food; to influencing household decision to seek care and the extent of health care they can receive[23,25]. There could be psychosocial issues linked to this negative economic impact as evident in the high level the dissatisfaction of the patients over the high cost of care in this study. The implications of this in resource-constrained settings is that households will repeatedly be faced with the reality of balancing health risks and the cost of seeking care before actual decision is made whether or not to seek care. This situation which presents a barrier to access, provide an imperative for pursuing appropriate policy that would ensure financial risk protection and guaranteed universal access to health care for all citizens especially the vulnerable groups like the children.

STUDY LIMITATIONS

Study participants were prospective patients who were discharged home from the emergency ward. Some of them where missed out as the research team could not meet them at the point of discharge or they declined consents and so were excluded from the study. We were unable to report the characteristics of these subjects and their exclusion may introduce some bias if they possess characteristics that differ substantially from those included in this analysis. Retrospective investigations into expenditure incurred by respondents could be affected by recall bias. We observed that some could only remember some of these direct costs when research assistants probed further using the inventory of known stages in the bureaucracy of seeking care in this hospital and scrutiny of available payment evidence in the possession of these clients.

CONCLUSION

Commonest paediatric emergencies were bronchopneumonia, diarrhoea disease and malaria which occurred mostly in children between the ages 1-5years.Thecost of medical care for paediatric emergencies which differ with respect to type of illness, could cause a large proportion of families to spend most of their disposable income on accessing care for just a single episode of paediatric emergency. The enormity of this is heightened by the near absence of financial risk protection which had left most families with no other option than to pay for care at the point of access. We recommend an intensification of efforts at scaling up social insurance scheme to cover all household as a means of assuring social health protection for all.

REFERENCES

1. Uzodike V, Olambiwonnu O, Johnson A, Odejide A, Toye S, Abdurrahman M, et al. Paediatric emergencies in general practice. Nig J Paediatr. 1976;3(2):39-44.
2. Iloh GU, Ofoedu JN, Njoku PU, Amadi AN, Godswill-Uko EU. The Magnitude of Under-

five Emergencies in a Resource-poor Environment of a Rural Hospital in Eastern Nigeria: Implication for Strengthening the House-hold and Community-integrated Management of Childhood Illnesses. North American Journal of Medical Sciences. 2012;4(8):344.
3. UNICEF. The state of the world's children 2006: excluded and invisible: Unicef; 2005.
4. Kanji N. Charging for drugs in Africa: UNICEF's 'Bamako Initiative'. Health Policy and Planning. 1989;4(2):110-20.
5. McPake B, Hanson K, Mills A. Community financing of health care in Africa: an evaluation of the Bamako initiative. Social Science & Medicine. 1993;36(11):1383-95.
6. McPake B. User charges for health services in developing countries: a review of the economic literature. Social Science & Medicine. 1993;36(11):1397-405.
7. Ogaji D, Nwi-ue L, Agalah H, Ibok S, DM N-u. Impact and contributors to cost of managing long term conditions in a university hospital in Nigeria. Journal of Community Medicine and Primary Health Care. 2015; 27(2):30 - 40.
8. Ezeoke OP, Onwujekwe OE, Uzochukwu BS. Towards universal coverage: examining costs of illness, payment, and coping strategies to different population groups in southeast Nigeria. The American Journal of Tropical Medicine and Hygiene. 2012;86(1):52-7.
9. Lagarde M, Palmer N. Evidence from systematic reviews to inform decision making regarding financing mechanisms that improve access to health services for poor people. Geneva: The Alliance for Health Policy and Systems Research. 2006;67.
10. World Health Organization. Health statistics and health information systems: World Health Organization; 2012.
11. Lagomarsino G, Garabrant A, Adyas A, Muga R, Otoo N. Moving towards universal health coverage: health insurance reforms in nine developing countries in Africa and Asia. The Lancet. 2012;380(9845):933-43.
12. Barasa EW, Ayieko P, Cleary S, English M. Out?of?pocket costs for paediatric admissions in district hospitals in Kenya. Tropical Medicine & International Health. 2012;17(8):958-61.
13. Sicuri E, Vieta A, Lindner L, Constenla D, Sauboin C. The economic costs of malaria in children in three sub-Saharan countries: Ghana, Tanzania and Kenya. Malar J. 2013;12(1):307.
14. Hussain H, Waters H, Khan AJ, Omer SB, Halsey NA. Economic analysis of childhood pneumonia in Northern Pakistan. Health policy and planning. 2008;23(6):438-42.
15. Naing L, Winn T, Rusli B. Practical issues in calculating the sample size for prevalence studies. Archives of Orofacial Sciences. 2006;1(1):9-14.
16. Araoye MO. Research methodology with statistics for health and social sciences. Ilorin: Nathadex Publishers. 2003:115-29.
17. SPSS I. IBM SPSS statistics base 20. Chicago, IL: SPSS Inc. 2011.
18. Iloh G, Amadi A, Nwankwo B, Ugwu V. Common under-five morbidity in South-Eastern Nigeria: a study of its pattern in a rural mission general hospital in Imo State. Nigerian journal of medicine: Journal of the National Association of Resident Doctors of Nigeria. 2010;20(1):99-104.
19. Altizer S, Dobson A, Hosseini P, Hudson P, Pascual M, Rohani P. Seasonality and the dynamics of infectious diseases. Ecology Letters. 2006;9(4):467-84.
20. Thomas C, Lindsay S. Local-scale variation in malaria infection amongst rural Gambian children estimated by satellite remote sensing. Transactions of the Royal Society of Tropical Medicine and Hygiene. 2000;94(2):159-63.
21. Anyanwu O, Ezeanosike O, Ezeonu C. Pattern and outcome of admissions at the children emergency room at the Federal Teaching Hospital Abakaliki. African Journal of Medical and Health Sciences. 2014;13(1):6.
22. Ewelukwa O, Onoka C, Onwujekwe O. Viewing health expenditures, payment and coping mechanisms with an equity lens in Nigeria. BMC Health Services Research. 2013;13(1):87.
23. Onwujekwe O, Hanson K, Uzochukwu B. Examining inequities in incidence of catastrophic health expenditures on different healthcare services and health facilities in Nigeria. PloS one. 2012;7(7):e40811.
24. Alpern ER, Stanley RM, Gorelick MH, Donaldson A, Knight S, Teach SJ, et al. Epidemiology of a pediatric emergency medicine research network: the PECARN Core Data Project. Pediatric Emergency Care. 2006;22(10):689-99.
25. Marmot M. Social determinants of health inequalities. The Lancet. 2005;365(9464):1099-104.