



Addis Ababa University

College of Health Science, Tikur Anbessa Specialized Hospital

Delays in laparotomy for acute abdomen

An observational study of pre hospital factors, conducted in two hospitals (ZMH, MIIH) from January to June 2020GC Addis Ababa, Ethiopia

Advisor: Dr Amezene Tadesse, Associate Professor, Consultant General and Pediatric surgery, AAU CHS TASH

Aemro Tadesse, GSR4, AAU CHS TASH

Introduction

Surgical Acute Abdomen is an emergency that requires prompt surgical intervention. Multiple studies have established a direct link between delays in presentation and surgical outcome in terms of morbidity and mortality. There are 4 layers/levels within the healthcare system: the Environment, the Organization, the Health Care Team and the Patient. When analyzing delays it is prudent to identify deficiencies at all 4 levels of the healthcare model interventions to correct or mitigate deficiencies will be different at each. Even though reasons for delay are multi factorial, it is prudent to identify deficiencies at all 4 levels of the healthcare model. This study mainly focuses on the influences of patient and primary health care factors for surgical delay in pre hospital time. We tried to see why patients delay in seeking help, and some factors after reaching healthcare system. Studies that have attempted to describe factors that significantly affect Health Seeking Behaviour(HSB) during illness episodes can be broadly classified into two. Studies which emphasize the utilization of formal health system, or **health care** seeking behavior of people. These involve creating models that describe series of steps people take towards health care model such as The Anderson, pathway models .The Andersen healthcare utilization model is a conceptual model aimed at demonstrating the factors that lead to the use of health services. According to the model, usage of health services is determined by three dynamics: Predisposing, Enabling factors and Need. Our study is under the second group. The Second group of studies demonstrate that decision to engage with particular channel is influenced by variety of factors such as socioeconomic status, age ,sex ,social status, type of illness access to service and perceived quality of service. The second group comprises those studies which emphasize the process of illness or HSB. Focus on specific genres of determinants which lie between patients and services such as geographical social economic cultural and organizational factors.

Operational Definitions

- **Health seeking behavior (HSB)** has been defined as, any action or inaction undertaken by individuals who perceive themselves to have a health problem or to be ill for the purpose of finding an appropriate remedy. Health-seeking behavior and is influenced by a multitude of factors, Factors that deter health-seeking behavior are collectively referred to as barriers to care
- **Health beliefs** are attitudes, values, and knowledge that people have about health and health services that might influence their subsequent perceptions of need and use of health service
- **Appropriate HSB** was defined as consulting a qualified medical professional or seeking healthcare at health facilities such as private clinics, primary health centers, and general hospitals during illness episodes or any situation requiring medical attention
- **Inappropriate HSB** comprises seeking healthcare from patent medicine vendors (PMVs), chemists, traditional healers, religious rituals or doing nothing at all. Inappropriate HSB has been linked to worse health outcomes, increased morbidity and mortality and poorer health statistics
- **Pre hospital Delay** defined as >48hrs from onset of symptoms until presentation to Out Patient department of study hospital.

Variables

- **Dependent Variable:** pre hospital delay, defined as >48hrs hrs between onset of symptoms and presentation to outpatient department of study hospital.
- **Independent variables**
 - Demographic details
 - Financial
 - Cultural
 - Health beliefs (attitude, values and knowledge)
 - Primary health care/ structural , (private/public tx, referral logistics)

Materials and Methods

A descriptive observational study was conducted, data collected from all consecutive patients meeting the criteria, using stratified questionnaires and interview with patients in ZMH and MH from January to June 2020gc . SPSS 26 (IBM) was used for statistical analysis of the data. Continuous variables were analyzed for normality. Chi-square analysis used to analyze the relationship between all variables and surgical delay. Significance was set at 0.05.If the relationship between the independent and dependent variable was significant, that variable was entered into a logistical regression model.

Results

All consecutive pts who underwent laparotomy in the 2 hospitals over a six month period were included. From a total of 380 pts who met the eligibility criteria, total of 163pts (40%) had delayed presentation, ranging from 48hrs up to 168hrs. Of these 116 were males, 47 females. Age ranged from 18-70, Mean: 35 ± 15 . Majority were from low socioeconomic strata, with low income and have only basic education, which were statistically significant reason for delay. Pattern of illness: perforated viscus 46 (28.2%), complicated appendicitis 40 (24.5%), intestinal obstruction collectively was the most common (38.6%). Majority of these patients practice Inappropriate HSB with overlapping pattern. 156 (95.7%) of patients self medicate **p 0.023**. 90(55.2%) of them first inclined to traditional/religious rituals (holy water/herbal medications) **p 0.041**. All of the patients went to primary health center, of which 119 (73%) private, and 44(27%) public, preference being variable reasons . 126(77.3%) of these patients were told to have another disease initially, and sent home inappropriately (gastritis) **0.03**. Anti pain, antibiotics, omeprazole, antihelminthics, laxatives were among the medications. None of the patients went home against advice to seek surgical attention. 149 (91.4%) considered it will self resolve (**0.04**). 156 (95.6%) of the patients claim financial constraints as their reason for delay(**0.023**) None of the patients had availability or proximity issues. None of the patients came directly to hospital and were referred from primary health center. 40 (24.5%) of them had free from charge card from local kebele and most patients had support from family/relatives financially during current illness and used OOP cash as payment. None of our patients utilized insurance from their work place for health care. None of the patients complained of responsibility at home or work for presenting late.

Demographics				
Characteristics		frequency	Percent	P value
Age	18-30	72	44.1%	
	30-40	45	27.6%	
	40-60	26	15.9%	
	>60	20	12.2%	
Sex (.297)	Male	116	71.2%	0.297
	Female	47	28.8%	
	Total		163	
Religion (.186)	Christian	151	92.6%	0.186
	Muslim	12	7.4%	
	Total		163	
Marital status (0.25)	single	117	71.8%	0.25
	married	46	28.2%	
	Total		163	
Occupation (0.069)	unemployed	64	39.3%	0.069
	unskilled worker	64	39.3%	
	semi skilled worker	35	21.4%	
	total		163	
Education (0.018)	no formal education	57	35%	0.018
	middle and high school	87	53.4%	
	university/diploma/graduate	17	10.4%	
	professional/technical training	2	1.2%	
	Total		163	
Income (0.036)	<1000birr	80	49.1%	0.036
	1000-2000birr	82	50.3%	
	2000-5000birr	1	0.6%	
	Total		163	

Self resolve	yes	149(91.4%)	.042
	no	14(8.6%)	
	Total	163	
Knowledge	Yes	39(23.9%)	.215
	No	124(76.1%)	
	Total	163	
Misconceptions	yes	30(18.5%)	.396
	no	133(81.5%)	
	Total	163	
Attitude	yes	115(70.6%)	.262
	no	48(29.4%)	
	Total	163	
Affordability	yes	156(95.7%)	.023
	no	7(4.3%)	
	Total	163	
Availability (private/public)	yes	163	
	no	0	
	Total	163	
Proximity <3hrs	Yes	163	
	No	0	
	total	163	

Staff available	yes	119(73.1%)	.142
	no	44(26.9%)	
	Total	163	
Complaints on behavior	yes	39(23.9%)	.215
	no	124(76.1%)	
	Total	163	
Doubts in quality	yes	44(27%)	.207
	no	119(73%)	
	Total	163	
Well equipped	yes	30(18.5%)	.396
	no	133(81.5%)	
	Total	163	
Long waiting time	yes	68(41.7%)	.247
	no	95(58.3%)	
	Total	163	
Medicine availability	yes	7(4.3%)	.125
	no	156(95.7%)	
	Total	163	

HSB weakness	yes	39(23.9%)	.115
	no	124(76.1%)	
	Total	163	
Routine hc visit	yes	44(27%)	.217
	no	119(73%)	
	Total	163	
Preventable	yes	30(18.5%)	.396
	no	133(81.5%)	
	Total	163	
Seriousness	yes	68(41.7%)	.147
	no	95(58.3%)	
	Total	163	
Fear/anxiety	yes	115(70.6%)	.262
	no	48(29.4%)	
	Total	163	
Complaints on providers behavior	yes	7(4.3%)	.125
	no	156(95.7%)	
	Total	163	
Media for awareness	yes	156(95.7%)	.231
	no	7(4.3%)	
	Total	163	

Self medicate	yes	2	73	81	156(95.7%)	.023
	no	0	7	0	7(4.3%)	
	Total	2	80	81	163	
Traditional healer/herbal	yes	0	18	32	50(30.7%)	.041
	no	2	62	49	113(69.3%)	
	Total	2	80	81	163	
Holy water/Rituals	yes	0	33	57	90(55.2%)	0.23
	no	2	47	24	73(44.8%)	
	Total	2	80	81	163	

Discussion

It is well established that delay is directly related with unfavorable surgical outcome . Professor Berhanu K (Pattern of Acute Abdomen in Adult Patients in Tikur Anbessa Teaching Hospital, Addis Ababa, Ethiopia. B. Kotiso z. Abdurahman 2007) showed 7% mortality when duration of illness was <48hrs, and 25% for when duration of symptoms >48hrs. Svanes et al (18) reported a 4-9 fold increase in mortality risk when emergency laparotomy for acute surgical abdomen was delayed beyond 12 hours of onset of symptoms in cases of perforated gut. Salman showed a direct relationship between the duration of acute abdomen and the incidence of post-operative complications. When the delay was one day, the complication rate was 25%. When the duration was more than 5 days, the complication rate was 100 %. Reasons for delayed presentation are complex and multi factorial. Our result showed similar findings with studies done around the topic.

In our study the results showed that low socioeconomic status, financial constraints, lack of awareness, inappropriate HSB (self medication, religious/traditional healer), mismanagement were statistically significant factors. Salman and Razonki found poor socioeconomic status to contribute to a delay in presentation. A study from Sudan in 2000 found late presentation to be due to poor awareness about the disease and misdiagnosis at primary healthcare settings. Vast majority of our patients were from low socioeconomic strata, with low income and have only basic education. Majority of the patients claim affordability was a reason for delay (pv 0.023). Lack of awareness was also statistically significant (0.042). Mbah et al concluded delay among patients admitted with acute surgical abdomen were most commonly due to financial difficulties. A study from Sudan in 2000 suggested that many patients present late due to poor awareness about the condition and its seriousness. Another study from Lahore by Mustafa and Abbas highlighted the importance of socioeconomic status for early and better utilization of available medical facilities. They showed that 74% of their study population belonged to poor and lower middle class leading to delayed presentation of acute abdomen. Besides socioeconomic status, lack of awareness about medical facilities, and social and cultural values were associated with a delayed presentation. A Nigerian study in 2010 found lack of financial resources to be an important factor in the delay in emergency abdominal surgery. From all eligible patients, 40% had delayed presentation with male: female ratio of 2.4:1, mean 108hrs. Intestinal obstruction accounted for majority(38%). Results were similar to other studies. A crosssectional study by Dr Berhanu Nega *pattern of acute abdomen and variables associated with adverse outcomes two years (Oct. 10, 2004 – Nov. 20, 2006) at Glenn C. Olsen Memorial primary general hospital* showed M:F 3:1, Intestinal obstruction leading cause with 34.9%, and 47.6% of patients presented after 48 hours of acute symptoms . Age, gender, marital status, pattern of illness, were not significantly associated with delay in our study. Wig et al. showed that men were more frequently affected than women in a ratio of 3:1. However, gender was not significantly associated with delay, in contrast with Dr Girmaye's result which showed female

were more prone to delay along with age and being referred from other facility. This may be due to females increase in access to care, information and economic stability. Pattern of Acute Abdomen in Adult Patients in Tikur Anbessa Teaching Hospital, Addis Ababa, Ethiopia. B. Kotiso , Z. Abdurahman 2007 male to female ratio is similar, range of delay from 6hrs to 21 days mean 4.6days, similar to ours 108hrs(4.5days). 72% visited other facilities once or more times before coming to hospital. Dr Berhanu Nega study showed more than half of the patients, (55.2%) had first visited other health care facilities and referred to our hospital. A higher proportion of delay was reported by Nyondo 64% delayed more than 48hrs (Prospective study by M. Nyondo Outcome of Emergency Abdominal Surgery at Kigali University Teaching Hospital:2013 A review of 229 cases). The majority (64.2%) of the patients presented to the hospital more than 48 hours after the onset of symptoms; 191 (83.4%) of the patients had visited other health institutions at least once before their coming to KUTH which was statistically significant.

Although the factors causing delay in presentation of cases of acute abdomen are mainly related to the patient, there were a significant number of cases in which the health care logistics was responsible for the delay. A study from Northern Pakistan has concluded that poor outcomes in surgically treatable patients were due to misinterpretation of symptom severity by first level health care providers and late referral to an appropriate surgical facility . The Sudanese study report in 2000 by Doumi and Mohammed that many patients were misdiagnosed at primary health care centers and were under treatment for malaria and colitis before being seen at the surgical casualty. The easy access to self-medication compounds the problem. A study of events in pre hospital period of acute abdomen in India by Shubada showed that misdiagnosis at primary health care was primary reason for delay. The Indian study also depicted that when interviewed, patients had received primary treatment in the pre-hospital period (97%). He also observed that delayed presentation was associated significantly with receiving primary treatment during the pre-hospital interval ($p<0.001$). Patients visited more than 1 private clinic (1%) and Public health centers (3.7%). Misdiagnoses and administering analgesics were the main reasons for delay. Similar findings were observed in a study done in Iraq by Salman and Razzouki which showed that in a significant number of cases the physician was responsible for the delay and were also referred late from primary health centers. Shubada patients had received primary treatment in the pre-hospital period. He also observed that delayed presentation was associated significantly with receiving primary treatment during the pre-hospital interval ($p<0.001$). Patients visited more than 1 private clinic (1%) and Public health centers (3.7%). Delayed presentation was defined as a pre-hospital interval >24 hours. Self medication (10.4%) Visited more than 1 private clinic (1%) Public health centers (3.7%) South African study: Understanding reasons for delay in acute appendicitis by v.y kong and c. aldous findings indicate that patients with acute appendicitis are at risk for delayed diagnosis after they have made contact with the healthcare system. A significant number were discharged home inappropriately. This result is also very similar to our finding where 77.3% of these patients were told to have another disease initially, and sent home inappropriately v.y kong and c. aldous also showed a significant number of the patients in series sought advice from traditional healers, and this was directly associated with subsequent assessment failure.

Inappropriate HSB has been linked to worse health outcomes, increased morbidity and mortality and underutilization of formal health services especially by the poor and disadvantaged. As in the Sudanese report, The Indian study by Shubada also showed that patients self medicate (10.4%). A Nigerian study: factors influencing health seeking behavior among civil servants by O. O. Latunji showed that Inappropriate HSB was observed among participants from low socioeconomic, which prevented them from visiting appropriate healthcare facilities for their illnesses. This study further revealed that the likelihood of seeking appropriate healthcare improved as socio-economic status improved. Although similar in our study that patients practice inappropriate HSB, the numbers are significantly higher with 95.7% of patients self medicate, and 55.2% of them first visit traditional/herbal/rituals. The reason for majority of our patients to seek inappropriate HSB may relate with affordability, similar to Latunji, Nigeria. Both Dr Girmaye's and Dr Berhanu N studies showed that majority of patients were referred from another center, and was statistically significant for delay. 72% of patients were referred from other centers in the study by Professor Berhanu K. In his study Dr Girmaye showed 54% of the cases with a prehospital time of more than 3 days had initially visited other health facilities. Patients who first attended health centres or smaller Hospitals were more likely to be delayed than those who went directly to either of the Referral hospitals. Similarly in our study, Prior to presenting to the hospital all of the delayed patients went to primary health center, of which 73% private, and 27% public. Other than showing that primary care logistics being a contributing factor for delay, majority of our patients, despite being from low socioeconomic strata prefer private setups and under usage of public services is noticed. Onwujekwe *et al* (2011), who reported only about 30% to 40% of the population as seeking health care at formal health centre in rural areas in southwestern Nigeria. Chemists or patent medicine vendors were the most sought healthcare providers among those who pay OOP. This is consistent with findings in other Nigerian studies among populations who pay primarily OOP.

Conclusion and Recommendation

We conclude that delayed presentation of patients with acute abdomen is often due to multiple intertwined reasons. Our results show that: Low socioeconomic status, financial constraints, lack of awareness and inappropriate HSB were all statistically significant patient factors along with misdiagnosis at primary health care are reasons for delay. Dissecting out these reasons will help in developing targeted quality improvement interventions.

Based on our study results we also recommend the following:

- The quality of care provided at health facilities requires attention. Improving the diagnostic capability of healthcare workers in primary health centers, as mentoring, supportive supervision and educational programs
- Further study on the private-public conundrum and referral logistics
- Educating the community about surgical illness and impact of delay
- Delays due to financial constraints can be overcome with formulation of short term credit facility for needy patients who will be required to reimburse before discharge. Advocating coverage of National Health Insurance should be considered for all. Besides better healthcare and financial coverage, it will decrease the flow of patients towards inappropriate HSB.
- Developing a program that integrates traditional healers into the healthcare system may be a potential intervention.
- Improve pharmaceutical sales surveillance and follow through (both public and private)

Limitations of these study include:

- Recall Bias dependent upon the information providers' ability to accurately recall events
- Done in an urban setup and might not clearly reflect the majority
- study was conducted only in public institutions
- Attitude toward perceived quality of institutions would be best addressed by non medical data clerks
- lost cards and faulty MRNs has been noticed
- In hospital delays and patient complications would have been more accurate to assess significance of delay

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23. ***Perforated Appendix - Delay in Presentation Rather than Delay in the Surgical Intervention: Retrospective Database Analysis of 2573 Saudi Arabian Patients in 10 Years***

Questionnaire

1. Age
2. Sex M F
3. Religion
4. Ethnicity/ Region
5. Occupation professional semi professional clerical/shop skilled worker semiskilled unemployed
6. Educational status professional Graduate intermediate/diploma highschool middle illiterate
7. Marital status Single Married divorce widowed
8. Income(in birr) -1000 1000-2000 2000-5000 >5000
9. How many days did you wait prior to contacting health care?1 B)2C)3D)>3
10. Do you get any support from local government administration/kebele during crisis like this? Yes
no
11. Do you have a local community based support system for crisis like this? Yes no
12. Did you consider that your current condition might worsen with delaying going to health care
facility?
13. Did you go to holy water or any other spiritual ritual prior to presenting health care facility? YES
NO
14. Do you think even public health care systems are expensive? YES NO
15. Do you have siblings or relatives that can help financially during times like your current illness?
Yes No
16. Assuming financial reasons being the reason for your current delay, do you think you would seek
healthcare earlier if you had no financial restrictions? Yes n
17. Assuming you had no financial restrictions, do you prefer going to traditional/herbal medication
over healthcare facility? Yes no
18. Did you know public facilities, in contrast to private settings, were not intended to benefit the
health care provider? Yes no
19. if yes, how many private clinic?1 2 3 >3

20. Were you told to have another disease? YES NO
21. Were you sent home after contact with health care system YES no
22. if yes, was it after contact with a private or public healthcare facility?YES NO
23. Do you have social issues(family, job, etc..) that inhibited you from going to health care early during this illness? YES No
24. Does income from your occupation cover health care cost? YES NO
25. Do you think even public health care systems are expensive? YES NO
26. Why did you prefer going to private?
27. Do you think service in terms of knowledge is better? Yes No
28. Did you go routinely before? Yes No
29. Have you been dissatisfied with service? Yes No
30. Were the HCWs good in providing service? Yes No
31. Are surgical services available? Yes No
32. Was there a long que or waiting time? Yes No
33. Were you satisfied by service in the private sector? Yes No
34. When taking self medication, did you get them from formal pharmacies? Yes no
35. Were you asked for a prescription? Yes No
36. Do you, for any reason, have doubt in the healthcare system? YES NO
37. Do you consider spiritual/religious rituals are more effective than treatment given within health centers? YES NO
38. When initially told you needed surgical intervention, did you have any doubts of “misdiagnosis” YES
39. If yes, was it because you had doubts about the health care system? YES NO
40. Do you recall any misdiagnosis or mistreatment of yourself or any other close person that you can relate to, that forced you into having unwanted surgical intervention? YES NO
41. Did you think seeking health care early for your symptoms be considered being weak in your family or community YES

42. Did you know that procrastinating your illness would have an impact on the outcome of your treatment? YES
43. do you think you would seek healthcare earlier if you had no financial restrictions? Yes no
44. Do you have any health care facility in your local area? YES NO
45. Do you take more than 6hrs, or have to take transport to reach health care facility in your area?
YES
46. have you ever visited it prior to your current illness for routine check up? YES
No
47. If yes, did you think the service was optima?
48. If it was not optimal, describe how.....
49. During your current illness, did you first visit a private health care system in contrast to a public health care facility? YES
50. Do you have any other known medical/chronic or surgical illness prior to your current disease?
51. Do you depend on anyone else to take care of you during routine activities prior to this illness?
YES NO
52. Did you think your current illness would resolve on its own without seeking medical advice? YES
NO
53. Did you self medicate or take any form of medication prior to presenting health care facility?
54. Did you go to traditional healer prior to presenting to health care center?
55. Did you consider that your current condition might worsen with delaying going to health care facility?
56. Did you go to holy water or any other spiritual ritual prior to presenting health care facility? YES
NO
57. Do you think even public health care systems are expensive? YES NO
58. Why did you prefer going to private?
59. Do you think service in terms of knowledge is better? Yes No
60. Did you go routinely before? Yes No
61. Do you go for routine check
62. Who Do you consult anyone when sick? Doctor/pharmacy/family/friend

63. When sick, where would u go? Government hospital/health center/private clinic/
pharmacy/holywater/traditional healer/religious spiritual council
64. Were you told to have another diagnosis
65. Were you sent home
66. Do you take medicine by yourself when sick
67. Do you get it from pharmacy
68. do they ask prescription
69. f public were you be satisfied?
70. f private were you satisfied?
71. What your best source to make you aware? TV, Radio, newspaper, from health provider,
pharmacy, friends and family
72. Do you know what your illness is
73. How do u get it
74. Which reasons give u the illness
75. How serious is it
76. Do u think it was preventable
77. Did you think it will self resolve
78. Do you think the symptoms would make you seem weak or ashamed if u admit being sick
79. What do you think of the public facility in your area?
80. Is it well equipped?
81. Do they have medicine?
82. Do they have surgical intervention units?
83. Is there a long waiting time from previous encounters?
84. Was healthcare provider good behavior wise?
85. Doubts in health care
86. Hx of misdiagnosis

87. Do you think investigations are expensive

88. Do u think they will harm you

89. Fear of Pills burden

90. Fear of wrongful surgery