

Institutional dynamics and health service delivery in regional referral hospitals in Uganda: What lessons from a case of Jinja Regional Hospital?

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Abstract

This paper reports on a study that examined the institutional dynamics affecting health service delivery at Jinja Regional Referral Hospital in Eastern Uganda. The institutional dynamics examined included the supply of essential medicines and other health supplies, physical infrastructure and the availability of medical equipment. While other factors were likely to affect the capacity of a health facility in improving its service delivery system, our hypotheses relied on institutional factors as the most likely dominant. Although contemporary analysis of development emphasises the central role of institutions, little work looks at how institutions matter for healthcare workers and health care delivery and that's the focus of this paper. One reason for the scarcity of work in this field is that it is unclear what the relevant theory is in this area. We used the institutional theory. The study population comprised of referral hospital top management, healthcare workers and a few purposively selected patients. The overall findings confirm that two institutional factors, namely physical infrastructure and medical equipment, are the dominant factors in explaining the level of health service delivery. Medical supplies were not found to be a significant predictor, suggesting that government health facilities are perhaps not seriously affected by lack of drugs but by inadequate facilities. This raises a governance issue among the health facilities. We suggest that the Ministry of Health should budget more funds for infrastructural development and emphasise more support supervision and monitoring strategies to ensure full utilisation of lower level health centre facilities so that referral hospitals are decongested and left to handle only referrals and emergency cases by specialists. The implementation and operationalisation of the policy to standardise equipment procurements at different health facility levels is likely to have positive implications in improving the situation.

Key words: Health delivery, infrastructural development, support supervision monitoring, medical equipment procurement, Uganda

Sumário

Este artigo relata um estudo que analisou a dinâmica institucional que afeta a prestação de serviços de saúde no Hospital de Referência Regional Jinja, em Uganda Oriental. As dinâmicas institucionais examinadas incluem o fornecimento de medicamentos essenciais e outros suprimentos de saúde, infraestrutura física e da disponibilidade de equipamentos médicos. Embora outros fatores sejam susceptíveis de afectar a capacidade de uma unidade de saúde na melhoria do seu sistema de prestação de serviços, nossas hipóteses basearam-se em considerar que elementos institucionais

são os mais prováveis para influenciar a dominância operacional. Embora a análise contemporânea de desenvolvimento enfatiza o papel central das instituições, poucos trabalhos analisam a forma como as instituições são importantes para os trabalhadores de saúde e na prestação de cuidados de saúde que é o foco deste artigo. Uma razão para a falta de trabalhos neste campo é que não é claro quais são as teorias relevantes para esta área. Nós usamos a teoria institucional. A população do estudo é composta pelo pessoal de gestão hospitalar de referência superior, profissionais de saúde e alguns pacientes proposadamente selecionados. Os resultados globais confirmam que dois fatores institucionais, infra-estrutura ou seja, física e de equipamentos médicos, são os fatores dominantes para explicar o nível de prestação de serviços de saúde. Suprimentos médicos não foram encontrados para ser um preditor significativo, sugerindo que as unidades de saúde do governo não são, talvez, seriamente afetada pela falta de medicamentos, mas por instalações inadequadas. Isto levanta uma questão de governação entre os serviços de saúde. Nós sugerimos que o Ministério da Saúde deverá orçar mais fundos para o desenvolvimento de infraestrutura e enfatizar mais a supervisão de apoio e estratégias de monitoramento para garantir a plena utilização das instalações do centro de saúde de nível inferior para que hospitais de referência sejam descongestionados e deixem de lidar com apenas referências e casos de emergência por especialistas. A implementação e operacionalização da política de padronizar as aquisições de equipamentos em diferentes níveis das unidades de saúde é susceptível de ter implicações positivas para melhorarem a situação.

Palavras chave: serviços de saúde, o desenvolvimento de infraestrutura, monitoramento de supervisão de apoio, aquisição de equipamentos médicos, Uganda

Introduction

Health service delivery remains at the core of government activities upon which the majority of citizens of a particular country depend. Failure of a health delivery system at any level of government legitimises accusations about the incapacity of governments. Referral hospitals are often located some distance from the national referral hospitals (capital city hospitals). They handle cases that are referred from the regional hospitals and need specialists' attention. Over the past few decades, health has attained worldwide recognition as a crucial component of human development and poverty eradication. In this regard, improvement of health is a critical governance issue. However, there is a realisation that one third of the world population lacks access to essential medicines, and this critically contributes to further poverty, mortality and morbidity (WHO, 2004). The 2009 Report of the Special United Nations Rapporteur on the Right to Health observed that the disease of the poor – that is maternal, peri-natal and nutritional diseases, among others – still account for 50% of the burden of diseases in developing countries.

Improving access to medicines alone can save ten million lives a year – four million in Africa and South Asia (WHO, 2010 Report). Effective health service delivery also depends on other determinants of health, which include the availability of highly motivated healthcare workers, well equipped infrastructure, access to roads, sanitation and to clean water (WHO, 2004). In Africa,

health service delivery has continued to face many challenges, most of which are similar across the continent. According to the WHO 2010 Report, in Mali for example, medical facilities are very limited and medicines are in short supply most of the time. In the 1990s, there were only five physicians per 100 000 inhabitants and only 36% of Malians were estimated to have access to health services within a five-kilometre radius, (WHO, 2010 Report). The health care system in Niger suffers a chronic lack of resources and a small number of health providers relative to the population. Most essential medicines are in short supply or unavailable. Similarly, the health system in Zimbabwe has more or less collapsed, and due to the political and economic crises, many doctors and other health personnel have migrated, hence resulting in very poor health service delivery (WHO, 2010).

From the 1960s to the mid 1970s, Uganda had one of the most effective public service systems in sub-Saharan Africa. The country's health system in particular, was one of the finest, with an effective referral system from the village dispensaries and district hospitals to the national referral hospital. During the 1970s and early 1980s, many of these institutional systems collapsed, resulting in substantial deterioration of the health outcome indicators (UBOS, 2009:1). By 1986, the health sector was in a state of near collapse, with dilapidated and very poorly equipped public health facilities. Healthcare workers in the public sector were demoralised due to very low and irregular wages, and in addition, public funding for the sector was unreliable (National Health Policy, 1999). While several reforms have been undertaken in the health sector with a view to improving health outcome indicators, progress has stagnated since the late 1990s. The immediate reform emphasis was on the rehabilitation of the existing facilities to restore functional capacity, and shift of emphasis to primary health care, in order to improve service delivery.

This paper examines the implications of institutional dynamics to health service delivery using the case study of Jinja Referral hospital. Although contemporary analysis of development emphasises the central role of institutions, it surprisingly looks at how institutions matter for healthcare workers and health care delivery, which is the focus of this paper. The rest of the paper is presented as follows: part two presents the study problem as well as the research questions that guided the study; part three reviews some secondary and primary literature; part four gives the methodology used for the study; part five presents and discusses the results. Finally, part six makes concluding remarks and suggests a number of implications from the study.

Study problem and research question

A high-performing, effective health care system is important for improvement in human health, accessibility and utilisation of health services, reduction of morbidity and mortality rates in the community, and economic growth of the nation. Uganda has one of the highest maternal mortality ratios in the world, currently at 435 per 100 000 live births, and infant mortality rates estimated at 76 per 1 000 live births (UBOS, 2006). If Uganda is to improve health service delivery and also meet the Health Millennium Development Goals (MDGs), the maternal and infant mortality rates will have to shrink to 131 deaths per 100 000 live births and 31 deaths per 1 000 live births respectively by 2015 (MOFPED, 2010; MOH, 2007).

The maternal deaths per year at regional referral hospitals are very high, with an average of 37 maternal deaths per hospital (MOH, 2009). In Jinja Regional Referral Hospital, the trends for the last three years has been an average of 30 maternal deaths per year and an infant death rate of about 14% in a month (Jinja Hospital, 2010). Some of the factors that contribute to these poor indices include poor access to and utilisation of health services that include delayed referrals, inadequate and ill-equipped lower level health facilities, unavailability or inadequate essential medicines and health supplies in the facilities (MOH, 2010). Poor health service delivery negatively affects access and utilisation of health services and the health of the general population, thus leading to low economic productivity. This consequently impacts negatively on the maternal and infant morbidity and mortality rates (WHO, UNICEF, UNFPA, 2007). All other health indices will also remain unacceptable and the quality of health care will get poorer. While the Ministry of Health have done assessments, among others, empirical studies have generally been lacking, creating a knowledge gap. While the 2010 assessment for example, highlights a number of factors that account for poor health service delivery, empirical analysis of the most important factors is lacking. Yet, that is the kind of information that would be needed to guide policy makers. This study therefore investigates the institutional factors that are likely to have significant implications to the delivery of health services in Jinja Regional Referral Hospital. The following questions are answered:

- 1: How do essential medicines and health supplies affect health service delivery at Jinja Regional Referral Hospital?
- 2: In what way does physical infrastructure affect health service delivery at Jinja Regional Referral Hospital?
- 3: How does medical equipment contribute to health service delivery at Jinja Regional Referral Hospital?

Literature review

Factors contributing to stock depletion at health facilities have been established and documented to include those at supply and consumption levels according to the findings of Arube-Wani, Jitta & Muiyinda, (2008); Yusuff & Tayo, (2004); and Abola, (2005). Characterised by late order placement by health facilities, late payment of previous drug orders, poor supply lead time, inadequate procurement policies, increased consumption, expiry of medicines, improper storage and inadequate product selection, have all contributed to the problem. Other factors include irrational prescription and dispensing by healthcare workers and lack of support supervision (Erah, Olumide & Ohamafe, 2003; Abola, 2005). Increased facility utilisation has also been cited as a factor that contributes to medicine shortage (Anakbongo, Aupont, Obua, Ogwai-Okeng & Ross, 2004). The 2010 report by the Medicines and Health Service Delivery Monitoring Unit (MHSDMU) in Uganda documents lengthy or inefficient procurement procedures, delayed deliveries, irrational prescriptions, poor stock management and poor needs assessments as reasons associated for stock shortage.

Studies elsewhere have shown that frequent shortages of essential medicines affect health service utilisation and delivery. According to Nabyonga, Desmet & Karamagi, (2005), patients tend to visit health facilities in large numbers when they have information that drugs are available. A review of literature from Tanzania suggests that people considered the availability of essential drugs a prerequisite to the credibility of health services, (Mamdani & Bangser, 2004). According to Wabwire-Mangen, Amuge & Pariyo, (2004), in Rakai District, some of the reasons why patients choose to go to a health facility include a short distance, cheap and free treatment, availability of drugs and quick service to patients. These findings therefore indicate that essential medicines and health supplies (EMHS) contribute to delivery of health services at health facilities. This study attempted to find out how essential medicines and health supplies affect health service delivery in Jinja Regional Referral Hospital, a facility with specialised services. All the above studies were done in a lower level health facility setting, with basic minimum requirements for primary healthcare.

Effective healthcare service delivery requires a network of functional health facilities. Over the past decade, the Ugandan Government has focused on expanding its health infrastructure through construction of more health facilities in an effort to bring services closer to the people. However, a number of these health facilities are neither manned with the right cadre of healthcare workers nor adequately equipped, (MOH, 2010). Although 72% of the households in Uganda live within five kilometres from a health facility, utilisation is limited due to poor infrastructure, lack of medicines and other health supplies, a shortage of human resources, low salaries, a lack of accommodation for staff at the health facilities and other factors that further constrain access to quality service delivery (MOH, 2010). Besides, maintenance of health infrastructure and medical equipment remains a major challenge coupled with inadequate supervision and monitoring of health facility functions (MOH, 2005). There are also variations with regard to access, ranging from as low as 7% of the population within five kilometres of a health facility in Kotido, to 100% in Jinja, Tororo and Kampala districts. Could similar factors also be a constraint to quality service delivery at Jinja Regional Referral hospital?

Some studies have shown that physical accessibility and improvement of the infrastructure affects health service utilisation and delivery. Jennings (2000) observed that the physical infrastructure at the service delivery point could enhance provider client interaction, creating an environment that fosters privacy, efficiency and client comfort. Physical infrastructure close to people seeking health services was found to increase utilisation rates of these health facilities in Uganda (Katende, 1994). This was also observed to be a key determinant to the utilisation of reproductive services in most developing countries (Gish, 1990; Peltzer, 2005). Health infrastructures far away from the people often negatively impact health service utilisation (Ikamari, 2004). This was also cited in several studies as a reason why women deliver at home rather than at a health facility (Amooti & Nuwaha, 2000; Parkhurs & Ssengooba, 2005). Similar observations were also made in others studies (Arinaitwe, 2001; Wagle, Svend & Bruun, 2004; Gage & Calixte, 2006). Failure of mothers to go back for postnatal services included, among other factors, poor access to a health facility, the unattractiveness of a health facility or poor infrastructure (Lukwago, 1998).

A study conducted in 2008 on users' satisfaction and understanding of client experiences showed that in general, clients were satisfied with physical access to health service delivery (66%) and availability and affordability of services, including the providers' skills and competencies (Arube-Wani, Jitta & Muiyinda, 2008). Other findings equally showed that adequacy of facilities and equipment actually predicted effective healthcare service delivery (Ogundele & Olafimihan, 2009). These findings therefore, clearly show that well constructed/maintained and equipped health facilities closer to the people contribute to delivery of health services. Could similar results be reported at Jinja Regional Referral Hospital for us to support earlier studies since it is a referral facility with specialised services compared to the other facilities for primary healthcare?

An essential component of health facility functionality is having appropriate and functional medical equipment. Equipment actually improves both diagnosis and treatment of patients at health facilities (MOH, 2005). An essential medical equipment credit line has been established by the Ministry of Health to ensure supply of essential medical equipment to the districts. Procurement, supply and installation of medical equipment and plants was done by various development partners in addition to training of equipment users and technical staff as part of capacity building for better management of health infrastructure. However, many districts in Uganda do not consider equipment maintenance a priority and do not use even the 5% provided regularly for this purpose (MOH, 2005). This has resulted in a lot of medical equipment breaking down and hence contributing to ineffective service delivery.

Ogundele & Olafimihan (2009) documented in their study that availability and adequacy of facilities and equipment actually predicted effective healthcare delivery service. Some of the main reasons why clients did not utilise the health facilities in Kampala City Council for example, included shortage of drugs and a lack of laboratory services due to inadequate equipment (Nsabiyumba, 2007). In the MDG report for Uganda, in 2010, only 5% of facilities have a vacuum extractor for assisted vaginal delivery (MOFPED, 2010). It also noted that insufficient supplies and commodities, as well as limitations in transport and communication for referral, are also key bottlenecks in the supply of maternal health services. A number of health facilities are underutilised because of non-functional equipment and this is due to various reasons like failure to repair or install, or to train users in operating them (MHSDMU, 2010). These reviews therefore affirm that the availability and functionality of medical equipment is crucial in delivering effective health services. This study critically looked at some of these factors and also tried to identify some of the gaps that other studies may not have addressed since none of them were done in a regional referral hospital.

Methodology

The case study combined with a cross-sectional design was used. The sample size included hospital staff, specifically top managers (4), medical doctors (6), Allied Health professionals (8), nurses/midwives (32) and patients (10) from the respective offices, wards and clinics. The response rate of the hospital staff was 100%. Similarly, the sampled patients had a 100% response rate. The mix of respondents from different categories provided varying views on health

service delivery issues. The patients are the direct consumers of the services and thus offered useful insights. Purposive sampling technique was used for the category of top management, medical doctors and allied health professionals. Whereas simple random sampling was used to get nurses/midwives, such a sampling gives equal chance for every cadre to be included in the selection so as to avoid bias.

Data was collected using a questionnaire, interviews, observation and analysis of existing documents. The reliability test for the quantitative data derived from the questionnaires was analysed using Cronbach's Alpha co-efficient, which built confidence in the data.

Table 1: Reliability results for variables

Variables	Description	Number of items	Cronbach Alpha
Dependent variable	Health service delivery	10	0.876
Independent variable	Essential medicines and health supplies	18	0.887
	Physical infrastructure	13	0.853
	Medical equipment	15	0.871

All the items in the different sections of the questionnaire had alpha greater than 0.7, which indicates a higher reliability as recommended by Amin, (2005). Respondents' views on institutional factors were analysed using descriptive statistics. Regression analysis was used to test the effect of institutional factors on service delivery. Interviews were conducted with key informants who included members of top management and patients who were purposively selected according to their experience and exposure to the hospital.

Findings and discussion

Before the multivariate results are presented, a description of the sample and descriptive results are presented. Among the top management staff, female respondents were 2 (50%), which implied gender equality as far as generating top management views. For healthcare workers, the study revealed 38 (82.6%) female respondents and 8 (17.4) male respondents. This seems to imply that more staff are female and it could be deduced that the majority of healthcare workers at Jinja Regional Referral Hospital are female. The study revealed that 75% of top management staff had a Masters degree in the field of patient management, hospital management and management of other resources, and 25% had an ordinary diploma in related areas. We can conclude that top management comprises managers whose education is above the minimum requirement for the health profession and therefore they have in-depth knowledge, skills and experience in health service delivery related issues. The varying levels of education are also likely to affect varying respondents' perceptions and enrich the study further. Meanwhile, among the healthcare workers, a majority (47.8%) had attained an ordinary diploma.

The study revealed 50% of the respondents among top managers in the age category 41-50 while 50% were above 50 years. Among the healthcare workers, 34.8% were in the age category 41-50, 10.9% are between 21-30, 23.9% in the age category 31-40 and 30.4% were above 50 years. This suggests that views about health service delivery at Jinja Regional Referral Hospital were generated from varying age groups – ranging from twenty-one to over fifty years of age. In addition, the public service policy puts retirement of healthcare workers at 60 years, implying that those above 50 years of age are likely to be focusing more on retirement than health service delivery. Since the majority was below 50 years, we are confident that the responses reflect the sentiments of those still in active service.

Among top management, 25% had worked for less than a year, 50% had working experience of 1-3 years and 25% had worked for 3-5 years in management. While among the healthcare workers, 15.2% had worked for less than one year, 6.5% had worked for 1-3 years, 17.4% had worked for 3-5 years and 60.9% had worked for over five years. This could imply that the majority of healthcare workers are very experienced and thus they are likely to give reasonable answers and responses as far as this study is concerned. The results from this table revealed that 39.2% of the health professionals (constituting the majority) were midwives, while the nurses constituted 30.4% of the healthcare workers. The lower cadre healthcare workers constituted the majority of the respondents as these were the front line health service providers. The result is in agreement with health policy guidelines that for improvement in maternal health, more of the lower health cadres such as midwives and nurses are required, since they are directly involved in delivering healthcare services to pregnant mothers and children respectively.

To measure health service delivery among healthcare workers, respondents were asked to disagree or agree with 13 items in the questionnaire. For the purpose of this study, the disagree and strongly disagree cases were merged to form disagree (D) opinion while the agree and strongly agree were merged to form the agree (A) opinion. Below is a summary of the descriptive results:

Table 2: Healthcare workers' responses on health service delivery

No	Items	Percentages				
		D	NS	A	M	SD
Service delivery indicators (healthcare workers)						
1	Essential medicines are adequate in my unit	82.6	6.6	10.8	1.98	1.04
2	The orders of essential medicines and supplies are timely	60.8	10.9	28.3	2.50	1.21
3	The delivery of essential medicines and supplies are timely	84.8	8.7	6.5	1.76	0.87
4	Patients receive appropriate dosages prescribed	50.0	4.4	45.6	3.00	1.28
5	Essential medicines provided in the private wing are at affordable prices to the individual patients	39.1	19.6	41.3	3.00	1.19
6	The physical structures in the hospital are easily accessible	39.2	8.6	52.2	3.04	1.55
7	There is adequate space for patients to be worked on	76.1	0.0	23.9	2.00	1.26
8	My unit has prescribing guidelines for essential medicines	30.4	10.7	58.9	3.37	1.36
9	The physical infrastructures offer privacy to the patients	65.2	2.2	32.6	2.46	1.43
10	The physical infrastructures offer comfort to the patients	63.0	8.7	28.3	2.43	1.34
11	The medicine equipment required for the unit/department are adequate for delivery of healthcare services	84.8	0.0	15.2	1.93	1.00
12	The medical equipment required for the unit/department are reliable for use	67.4	8.7	23.9	2.41	1.15
13	The medical equipment required for the unit/department are available when needed for use	52.1	8.7	39.2	2.74	1.34
Overall aggregated statistics		61.2	6.9	31.3	2.5	1.23

Key D = disagree + strongly disagree; A = agree + strongly agree; NS = not sure; M = mean and SD = standard deviation.

The majority of healthcare workers (82.6%) disagreed that essential medicines in their units were adequate, 6.6% were not sure and only 10.8% agreed. The study also revealed that 45.6% of the respondents agreed that patients receive appropriate dosages prescribed, 4.4% were not sure and 50.0% were in disagreement. This generally implied that patients did not receive appropriate dosages prescribed by the healthcare workers. This result was substantiated with results from oral interviews with one of the top managers. When asked whether patients receive appropriate dosages, they replied, "Patients receive the 1st or 2nd doses and are asked to buy the rest of the dosages." Documentary reviews also revealed that healthcare worker requisitions from stores were always short by more than half. For instance, documents indicated that for a requisition of 500 tablets from stores, less than half (200) would be issued. Concerning the timely supply of essential medicines and supplies, 60.8% disagreed, 10.9% were not sure and only 28.3% were in agreement. Records from stores indicated that it takes over three months to supply some of the essential medicines and other health supplies. Health service delivery was also measured using accessibility of infrastructure, adequacy and availability of medical equipment. Concerning the same, 39.2% disagreed, 8.6% were not sure and 52.2% agreed that the available infrastructure is easily accessible. Regarding medical equipment, 84.8% disagreed that medical equipment

required for the health facility is adequate for delivery of health services, while 15.2% were in agreement. The aggregated mean of 2.5% implies that generally healthcare workers disagreed with all the measures of health service delivery in terms of accessibility, timeliness, availability and adequacy of physical infrastructure, medical equipment, essential medicines and health supplies.

Table 3: Respondents' views on essential medicines and health supplies

No	Items	Percentages				
		D	NS	A	M	SD
Essential medicines and health supplies						
1	Essential medicines are adequate in my unit	82.6	6.6	10.8	1.98	1.04
2	Essential supplies are adequate in my unit	89.1	8.7	2.2	1.74	0.71
3	The order of essential medicines and supplies are timely	60.8	10.9	28.3	2.50	1.21
4	The delivery of essential medicine and supplies are timely	84.8	8.7	6.5	1.76	0.87
5	Patients receive appropriate dosages prescribed	50.0	4.4	45.6	3.00	1.28
6	Essential medicines in my unit are of the approved quality	19.5	13.0	67.5	3.65	1.18
7	My unit has prescription guidelines for essential medicines	30.4	10.7	58.9	3.37	1.36
8	Medicines and essential supplies expire in my unit	82.6	2.2	15.2	1.76	1.14
9	Storage facilities for all medicines and essential supplies are adequate	58.7	4.4	36.9	2.57	1.29
10	The medicines needed for my unit are identified by patient demands	54.2	6.6	39.2	2.85	1.32
11	The medicines needed for my unit are identified by patients' needs	43.5	10.9	43.5	2.91	1.28
12	The medicines needed for my unit are identified by a medicines and therapeutic committee	47.9	10.9	41.2	2.85	1.35
13	The medicines needed for my unit are identified by a Departmental needs assessment	36.9	2.2	60.9	3.28	1.36
14	The medicines needed for my unit are identified by the National Medical Store	26.1	13.0	60.9	3.41	1.26
15	Information for the medicines/essential supplies are well stored	19.6	8.7	71.7	3.63	1.00
16	Essential medicines provided in the private wing are at an affordable price for individual patients	39.1	19.6	41.3	3.00	1.19
17	Patients visit the hospital as soon as essential medicines are delivered to the hospital	58.7	6.5	34.8	2.74	1.27
18	Patients visit the hospital when doctors and other healthcare is available even when essential medicines are not available	23.9	6.5	69.6	3.59	1.39
Overall aggregated statistics		50.5	8.6	40.8	2.81	0.43

Key D = disagree + strongly disagree; A = agree + strongly agree; NS = not sure; M = mean and SD = standard deviation

Concerning medicine and health supplies orders, 54.2% disagreed that medicine needed in the units was identified by patient demands, 6.6% were not sure, while 39.2% were in disagreement. Moreover 60.9% agreed that medicines needed by the units were identified by national medical stores, 13.0% were not sure and only 26.1% were in agreement.

Table 4: Healthcare workers' response on physical infrastructure

No	Items	Percentages				
		D	NS	A	M	SD
Physical infrastructure						
19	The physical structures in the hospital are easily accessible	39.2	8.6	52.2	3.04	1.55
20	There is adequate space for staff to work	76.1	0.0	23.9	2.00	1.26
21	There is adequate space for patients to be worked on	80.4	6.5	13.1	1.87	1.09
22	The physical facilities are functional for staff	67.4	4.3	28.3	2.36	1.27
23	The physical facilities are functional for patients	60.9	8.7	30.4	2.50	1.35
24	The physical infrastructures for my unit are properly maintained	54.4	6.5	39.1	2.61	1.34
25	The right personnel are available to sustain the maintenance of the infrastructure	67.4	17.4	15.2	2.26	1.04
26	The physical facilities are supervised and monitored regularly for maintenance	67.4	8.7	23.9	2.24	1.16
27	The physical infrastructure offer privacy to patients	65.2	2.2	32.6	2.46	1.43
28	The physical infrastructure offer comfort to patients	63.0	8.7	28.3	2.43	1.34
29	The physical infrastructure are adequate for patient management	78.2	4.4	17.4	2.11	1.08
30	The physical infrastructure are adequately equipped for staff use	91.3	4.3	4.3	1.70	0.76
31	The physical infrastructure are adequately equipped for patient use	89.1	4.3	6.6	1.85	0.79
Overall aggregated statistics		69.2	6.5	24.3	2.26	0.76

Key D = disagree + strongly disagree; A = agree + strongly agree; NS = not sure; M = mean and SD = standard deviation

Healthcare workers were asked to give their views on adequacy of space for patients to be worked on and 80.4% were in disagreement, 6.5% were not sure and only 13.1% were in agreement. Further inquiry on whether physical infrastructures were adequately equipped for patient use, 89.1% disagreed, 4.3% were not sure and only 6.6% agreed. For physical infrastructures being adequately equipped for staff use, 91.3% disagreed, 4.3% were not sure while only 4.3% agreed. When asked whether physical facilities were supervised and monitored regularly for maintenance, 67.4% disagreed, 8.7% were not sure and only 23.9% agreed.

Table 5: Healthcare workers' responses on medical supplies

No	Items	Percentages				
		D	NS	A	M	SD
Medical equipment						
32	The medical equipment required for the unit/department are adequate for delivery of health services	84.8	0.0	15.2	1.93	1.00
33	The medical equipment required for the unit/department are reliable for use	67.4	8.7	23.9	2.41	1.15
34	The equipment for the unit/department are durable when in use	37.0	21.7	41.3	2.96	1.09
35	The equipment for the unit/department are appropriate (right type) for use	43.4	2.2	54.4	3.07	1.29
36	The equipment for the department are functional when in use	37.0	13.0	50.0	3.07	1.16
37	The equipment for the unit/department are maintained regularly	63.0	10.9	26.1	2.46	1.19
38	The equipment for the unit/department are available when needed for use	52.1	8.7	39.2	2.74	1.34
39	Patients are sometimes referred to other health facilities because of non-functional equipment	36.9	2.3	60.8	3.24	1.51
40	Patients are sometimes referred to other health facilities because staffs are not trained to use the medical equipment	78.2	4.4	17.4	2.04	1.17
41	Patients are sometimes referred to other health facilities because of a lack of equipment	30.4	4.3	65.3	3.52	1.47
42	My commitment to work is affected the adequacy of the medical equipment in the hospital	32.6	4.3	63.1	3.41	1.48
43	My attitude to work is affected by the type of medical equipment in the hospital	47.8	2.2	50.0	2.93	1.44
44	There are measures in place for my unit/department to ensure sustainability of medical equipment	43.5	6.5	50.0	3.04	1.40
45	The units are consulted when medical equipment are being purchased	67.4	6.5	26.1	2.26	1.34
46	My unit/department is well equipped	86.9	2.2	10.9	1.78	1.01
Overall aggregated statistics		53.9	6.5	39.6	2.72	0.48

Key D = disagree + strongly disagree; A = agree + strongly agree; NS = not sure; M = mean and SD = standard deviation

Healthcare workers were asked to give their views on whether their units/departments were well equipped: 86.9% disagreed, 2.2% were not sure while only 10.9% were in agreement. Moreover, concerning regular maintenance of the available equipment, 63.0% disagreed, 10.9% were not sure and only 26.1% agreed. Pertaining to consultation of users when equipment are being procured, 67.4% disagreed, 6.5% were not sure and only 26.1% agreed. The overall aggregated statistics

revealed that 53.9% of the respondents disagreed that medical equipment were adequate for use, and only 39.6% were in agreement. To substantiate this quantitative data, healthcare workers were interviewed about how medical equipment affected their commitment and attitude to their work. One of them stated: “My commitment and attitude towards my work is highly affected by the availability, adequacy and usability of the medical equipment. Some of the equipment is hard to use and most times it is brought to us without user or maintenance guides.”

Table 6: Results of regression analysis

Model		Unstandardised coefficients		Standardised coefficients	t	Sig.
		B	Std. error	Beta		
1	(Constant)	2.206	.540		4.087	.000
	Sex	.099	.298	.061	.333	.741
	Level of education	-.066	.100	-.121	-.667	.508
	working experience	.059	.086	.105	.684	.498
2	(Constant)	-.014	.428		-.032	.975
	Sex	-.205	.149	-.125	-1.376	.177
	Level of education	.005	.050	.009	.097	.923
	working experience	.060	.042	.107	1.414	.165
	Physical infrastructure	.594	.071	.720	8.353	.000
	Medical equipment	.382	.118	.294	3.249	.002
	Essential medicines	.034	.126	.024	.272	.787

Physical infrastructures and medical equipment were found to be the strongest institutional dynamics that if worked upon, can contribute to improved health service delivery. On the basis of the emerging results in Table 6, we tested the study hypotheses as follows:

H1: Essential medicines and health supplies have an effect on health service delivery.

The study revealed that essential medicines have the lowest beta value of 0.024 and sig value of 0.787, which is not statistically significant due to the fact that it was above the acceptable limits of 0.05. This implies that the relationship between essential medicines, health supplies and health service delivery is not significant – even if essential medicines and health supplies are improved, health service delivery is not likely to improve. Therefore, to healthcare workers, essential medicines and health supplies do not contribute significantly to health service delivery. It is also ranked last in contributing to health service delivery among all the institutional factors studied. The study therefore rejects the alternate hypothesis.

H2: Physical infrastructures affect health service delivery.

The study revealed the highest beta value of 0.720 and sig. value of 0.000 that was statistically significant. This variable is ranked first among the three factors in contributing to health service delivery. Improving physical infrastructure is therefore likely to improve health service delivery. The study therefore accepts the research hypothesis.

H3: Medical equipment contributes to health service delivery.

According to healthcare workers, the beta value of 0.294 was second among the investigated institutional factors. The sig. value of 0.002 also revealed statistically significant results. This variable is ranked second in contributing to health service delivery. The alternate hypothesis is therefore accepted.

Conclusions and implications

This study contributes to the existing body of knowledge in the area of institutional factors having an effect on health service delivery. The study further makes practical recommendations that aim at improving health service delivery at Jinja Regional Referral Hospital in Uganda. This study investigated a few institutional factors affecting health service delivery, although there could be other factors apart from these ones studied or other non-institutional factors that may affect health service delivery that could be investigated in another study. The study was carried out at Jinja Regional Referral Hospital and yet different regional referral hospitals may be endowed differently with disease patterns, health conditions and risk factors to the catchment populations. A similar study may therefore be undertaken among all the regional referral hospitals in Uganda. Besides, there could be other causes of maternal and infant mortality, other than the factors that have been examined and these can be further investigated. However, we have strong confidence in the results presented. Our findings have important implications for different role-players.

At an individual level, healthcare workers need to forecast which essential medicines and health supplies will be needed and order in a timely fashion to ensure timely procurement and deliveries. They should also prescribe medicines to patients in right dosages and indications and offer counselling to patients as far as best practices for medicine use is concerned. To patients, much as medicine is an integral element in disease management, not all illnesses or diseases require medicine. Therefore, they should visit health facilities to get proper diagnoses and receive appropriate medicines. This will eliminate self-medication that normally leads to over dosage or under dosage, hence adverse health effects. Information to the community about this should be disseminated by the Information and Media Department at the MOH headquarters and also by the respective Community Health Departments at the district and regional referral hospitals.

Healthcare workers should make use of the available physical infrastructure for best use and these should be well maintained by management. Therefore, health facility management should plan and appropriately budget for maintenance of the equipment, and this plan and activity should be implemented accordingly. In addition to a maintenance budget, management should plan and

budget for more physical infrastructural development in order to create more office space and changing rooms for healthcare workers, more storage space, ward space and wash rooms to ensure that healthcare workers are comfortable at work. The government of Uganda, through the Ministry of Finance, Planning and Economic Development, should approve and allocate the budget for this accordingly. Taking into consideration the increasing number of patients at the regional referral hospitals, the Ministry of Health should allocate more funds for infrastructural development for expansion. The government should also allocate more funds to the health sector so that health service delivery is addressed in totality. There should be strategies to ensure full utilisation of lower level health facilities so that Jinja Regional Referral Hospital is decongested and left to handle only referral cases for specialists' attention. At all levels, patients should be encouraged to utilise lower level health centres through health education programmes and sensitisation. This can also be made effective by the information and media department at the Ministry of Health headquarters, but also through the Community Health Departments at the regional referral and general hospitals.

Healthcare workers need to handle the available equipment with care and diligence so that they last a long time. They should also give right information during appraisals so that equipment utilisation gaps are identified by management for appropriate intervention. On identification of the equipment usage gap, management should offer training and refresher courses to staff in order to have their skills and knowledge enhanced; user needs assessment should be emphasised by departments and Jinja Regional Referral Hospital management should ensure that healthcare workers are availed with equipment they; there should be proper records, maintenance and inventory management of the medical equipment; the health referral hospitals should budget adequately for buying and maintaining the equipment. This can be done by utilising capital development funds. The Ministry of Health should recruit and train more bio-medical technicians/engineers, deploy them in the referral hospitals and other lower level health facilities to ensure effective and timely maintenance of the equipment, and the Ministry of Health should also enforce the application of the policy to standardise equipment procurements at different health levels.

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