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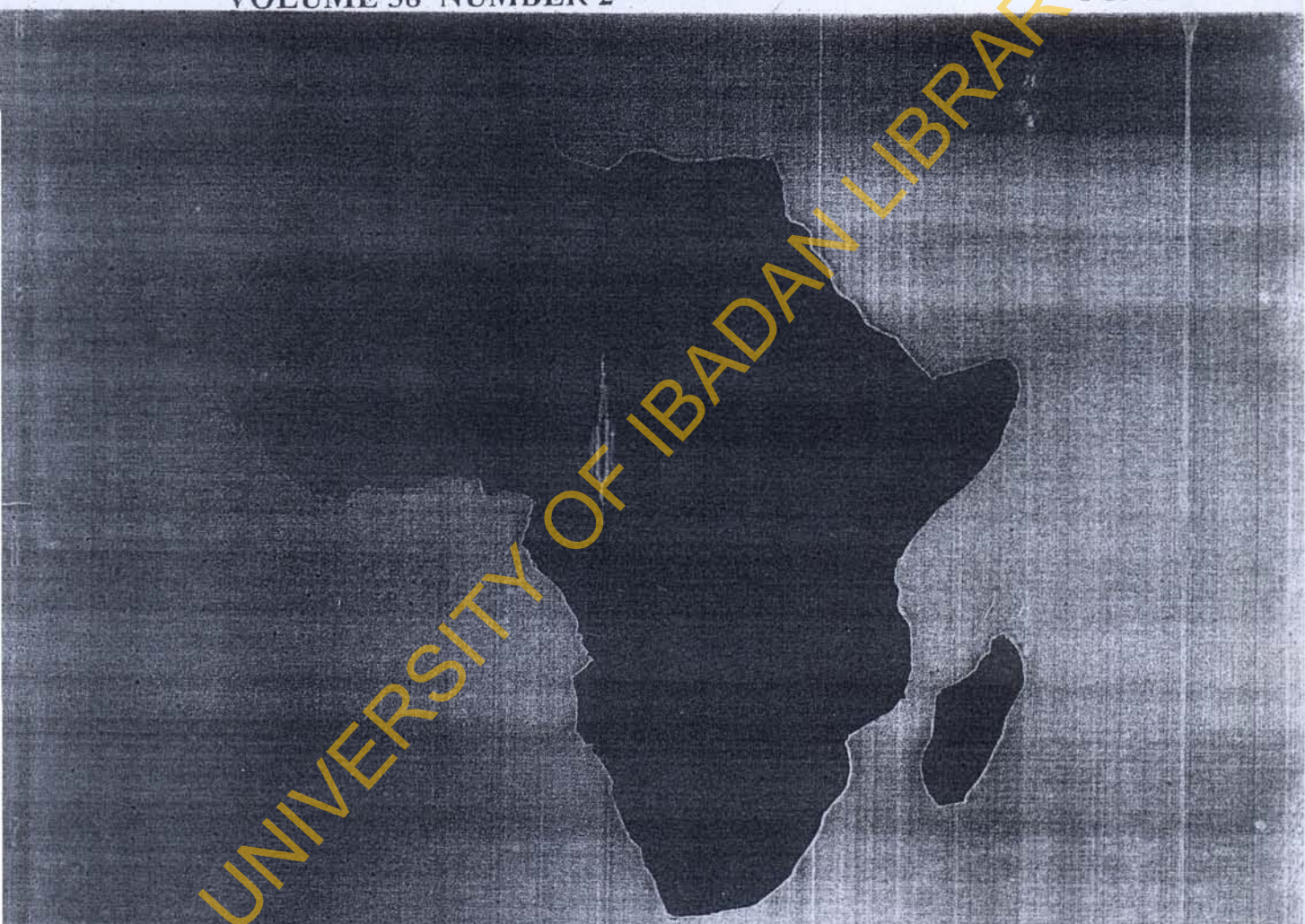

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Theatre personnel's perception of operating room resource allocation

AO Adejumo[1] and PO Adejumo[2]
Department of Psychology, the Centre for West African Bioethics[1] and Department of Nursing[2], College of Medicine, University of Ibadan, Ibadan, Nigeria

Summary
Operating rooms (OR) in hospitals represent big investments and must be utilized efficiently. Inaccurate scheduling of OR resources often results in delays of surgery or cancellations of procedures. These are costly to the patient, surgical team and hospital. Existing literatures in the OR management lack consensus on the method of evaluating management decisions from the perspectives of personnel or those affected by management decision-making processes. Eight key informant interviews were conducted. Also, 50 Operating Theatre Personnel (OTP) i.e. Surgeons, OR Nurses, Anaesthetists, and Executive Officers in the Nigeria's premier University Teaching Hospital were asked to complete a survey questionnaire concerning operating theatre resource allocation in the hospital. Five close-ended and 10 open-ended questions were used. (For example, how are the decisions to allocate OR resources in this hospital made?) Thematic analysis and descriptive statistics were done. The theoretical framework, accountability for reasonableness was applied. Forty-eight percent of the participants were ignorant of the framework guiding OR resource allocation. 54% of the respondents admitted the current mechanism for publicizing management decisions on OR resource allocation is ineffective. Another 50% of the respondents knew little about the mode of appealing against unfavourable allocation decisions. Participants' open ended responses revealed that hospital executives and a few consultant surgeons control the allocation of OR resources, with little recourse to OR personnel's concerns. If operating theatre stake holders are excluded in the planning, allocation and evaluation of OR resources, the efficiency required in surgical services would never be realized irrespective of the dexterity of the surgical team.

Keywords: *Operating Room, theatre personnel, resource allocation, accountability for reasonableness.*

Correspondence: Dr. Prisca Olabisi Adejumo, Department of Nursing, College of Medicine, University of Ibadan, Ibadan, Nigeria. E-mail: bisiandbayo@yahoo.com

Résumé
Les blocs opératoires dans les hôpitaux représentent un grand investissement et doivent être utilisées judicieusement. Une mauvaise organisation des ressources du bloc opératoire résulte souvent à un retard de l'opération ou à l'annulation des procédures. Ceci est couteux pour le patient, l'équipe chirurgicale et l'hôpital. La littérature existant sur la gestion des blocs opératoires manque de consensus sur la méthode évaluant la gestion des décisions a partir de la perspective du personnel ou ceux affectes par le processus de gestion des prises de décision. Huit interviews sources d'information étaient conduites. Aussi, 50 personnels de bloc opératoire ie les chirurgiens, les infirmiers du bloc opératoire, les anesthésistes et les officiers exécutifs dans le premier centre hospitalier universitaire du Nigeria complétaient un questionnaire de recherche concernant l'allocation des ressources du bloc opératoire dans l'hôpital. Cinq questions fermées et dix questions ouvertes étaient utilisées (par exemple, comment sont prise les décisions d'allouer les ressources du bloc opératoire dans cet hôpital ?) une analyse thématique et des statistiques descriptive étaient faite. Quarante huit pour cent des participants étaient ignorant des modalités de guide or de l'allocation des ressources. 54% des participants n'admis que les mécanismes courant pour la publicité des décisions des soins de ménagement ou pour une allocation ineffective des ressources. 50% des participants connaissaient très peu a propos de la mode de faire une requête contre une décision d'allocation non favorable. Les réponses ouverte des participants dévoilaient que les exécutifs de l'hôpital et quelques chirurgiens consultants contrôlaient les ressources ou allocation.si les contributeurs des salles d'opération sont exclu dans la planification, l'allocation et l'évaluation de ou des ressources, les services chirurgicaux ne pourrions jamais réaliser leur dextérité.

Introduction

Operating rooms (OR) in hospitals represent big investments and must be utilized efficiently [1]. Hospital managers are daily faced with ever increasing demands between and even within competing sectors of health institutions. The advances in surgical technology and surgical services are becoming safer, costlier and more acceptable to

health care consumers [2]. This increased acceptance necessitates greater precision in operating room scheduling.

Inefficient or inaccurate scheduling of OR time often results in delays of surgery or cancellation of procedures, which are costly to the patient, surgical team and the hospital. The continuously dwindling available human resources in form of perioperative nurses, anaesthetist, theatre orderlies etc., and material resources such as theatre space, consumables, anaesthetics, etc., within surgical services require allocation of these resources among multiple surgical groups [3]. Therefore, modern OR management requires reasonable rationing of available operating resources in order to guarantee efficiency in the utilization of OR.

There is no generally accepted criteria for OR allocation. Existing theories in the fields of medicine and hospital management lack consensus on the method of evaluating management decisions from the perspectives of personnel or those affected by management decision making processes. Different reasonable people will emphasize different values regarding OR allocation: researchers, physicians, administrators, managers, scientists and so on with each view scheduling differently [4].

To overcome this problem, a number of authors have proposed theoretical and conceptual frameworks for OR allocation [5,2,1]. Unfortunately, these frameworks have failed to address the core issues in the art and science of contemporary operating theatre resource allocation, thus unacceptable to OR service providers. The need for a unique method of determining the ethical standard of OR allocation method from operating theatre personnel's perspective therefore becomes critical at this time of giant revolutions in hospital cost control and drive for greater efficiency. In the context of profound disagreement about criteria for OR allocation, the key goal must be fairness – that is, decision makers must employ a process of allocation that can be accepted as fair, even if there is disagreement about outcomes. The conceptual framework for this study was the justice framework of Daniels and Sabin [6] entitled "accountability for reasonableness". The theoretical framework stipulates that four conditions must be met for a decision making process to be considered fair [7, 6, 8]. The conditions are Publicity, Relevance, Appeals and Enforcement. There is a growing acceptance of this framework among researchers involved in ethical appraisal of health-related policy decisions [9, 10, 11, 12].

The University College Hospital, (UCH) Ibadan is the premier teaching hospital in Nigeria. This federally funded health care facility presents peculiar management challenges requiring empirical investigation. The available facilities such as water, electricity and finance are far below the hospital requirement. As a result, human and material resources are often critically rationed. The number of patients on the OR waiting list is constantly increasing. Operation list of most surgery specialties are rarely cleared within allocated OR hours, with resultant backlogs. In order to maintain operational efficiency, the UCH management allocate scarce resources among competing units of surgical services in the hospital. The appraisal of this by stakeholders is not clearly understood, especially in resource limited settings like Nigeria. The purpose of this study is to describe and evaluate the perception of Theatre personnel about allocation of OR resources.

Materials and methods

This was a qualitative case study. A case study "is an empirical inquiry that investigates a contemporary phenomenon within its real-life context [13]. A semi-structured survey questionnaire was also used to gather quantitative data.

Participants and sampling

In order to facilitate triangulation during the first stage of the study, theoretical sampling was used in selecting participants for key informant interviews (KIIs). In this non probabilistic technique, the researchers' goal is not the representative capture of all possible variations, but to gain a deeper understanding of analyzed cases and facilitate the development of analytic frame and concepts used in the research. Individuals who were recommended by participants in initial interviews were subsequently included, until no new themes emerged as used in a similar study earlier [14]. The interviewees were made up of 4 consultant surgeons, three nurses between the ranks of Principal Nursing Officers and Chief Nursing Officers, and also a chief executive officer in the hospital administration. Theoretical sampling was also adopted to accommodate "emerging patterns" that arose through the process of data collection that led the researchers in directions that contributed to further data collection [14].

During the second stage of the study, a 16-item self developed questionnaire divided into 2 sections was used for data collection. Section A tapped information about socio-demographic data, while Section B obtained information on perception

and evaluation of operating theatre resource allocation. Fifty participants were purposively selected following an inclusion criteria of currently being in the UCH employment and directly involved in rendering direct OR surgical services. The respondents consisted of 22 Peri-operative nurses, 20 Surgeons, 5 Anaesthetists, and 3 Administrative staff. The sample size for the study was not formally calculated since a theoretical sampling was used. It was rather stopped when no new concepts were arising during analysis of successive data.

Data collection

Data was collected between February and April 2005. Eight KIIs were conducted during the first (pilot) stage. The interview guide questions were developed in line with related literature [1, 2, 3, 4, 11,13]. They were worded to elicit information related to the four conditions of "accountability for reasonableness". The question items were revised for face and content validity by faculty members at the Joint Centre for Bioethics, University of Toronto, Canada. All the interviews were recorded and transcribed. The responses from the KIIs added to information obtained in existing literature were used in designing a semi-structured questionnaire. The final document consisted of 10 open ended and 5 close ended items.

Data analysis

Data were analyzed using descriptive statistics for the quantitative questions and modified thematic analysis for the qualitative questions. These concepts were then compared within and between data sources. Data with similar concepts were sorted into overarching themes related to allocation decisions, and further sorted according to participants' professional specialization. These were done taking the four conditions of accountability for reasonableness into consideration. Responses were then developed using verbatim quotes from the data to support the verisimilitude of the descriptions. The validity of the data was 'safeguarded' by triangulation [15]. It is a method-appropriate strategy of improving the credibility of qualitative analyses. It becomes an alternative to traditional criteria like reliability and validity.

Research ethics:

Approval for the study was obtained from the University of Ibadan (UI) and UCH Ethical Review Committee. Appropriate steps in meeting research ethics guidelines were followed.

Results

The ages of the respondents ranged between 23 and 58 years with a mean age of 29 years. The working experience ranged between 1 and 29 years with a mean of 13 years. The results obtained from data analysis were organized according to the four conditions of accountability for reasonableness [6]. In testing the Relevance Condition, participants were asked the question "Explain the reasons adduced by operating theatre managers in this hospital for allocating operating rooms and theatre resources." Research participants' opinions are presented in Figure 1.

Forty-eight percent of the respondents had no idea of the reasons considered by the hospital in allocating OR resources; 12% identified availability

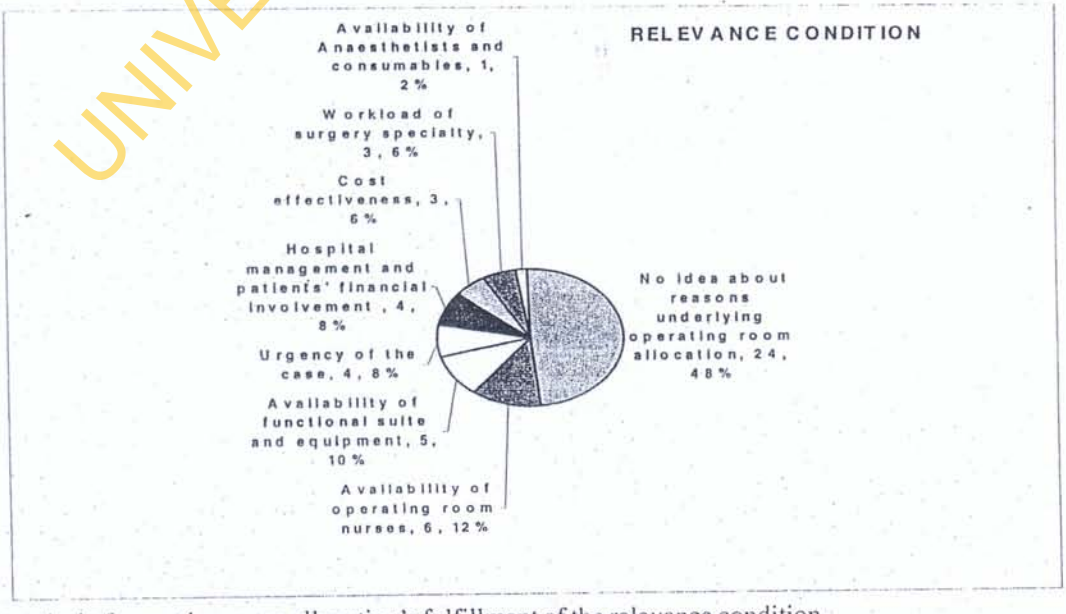

Fig. 1: Appraisal of operating room allocation's fulfillment of the relevance condition.

of OR nurses as the reasons for hospital administration allocating OR resources in UCH; 10% identified availability of functional operating theatre suites and equipment; 8% identified the patient's payment of operation fees and affordability of hospital bills; 8% identified urgency of the case or items needed for the surgery; 6% identified cost effectiveness; another 6% felt that peculiar demands and workload of each unit determine the allocation of OR resources; and 2% felt that availability of anaesthetists and consumables are the main determinants.

Additionally, during one of the KIIs, a consultant surgeon said:
"I believe the workload is an important factor considered in allocating operating room facilities in this hospital. Even though ,there is no rigid framework for allocating operating room resources, the preferences of the Chief Medical Director, discretion of the Head of Surgery and "weight " of the consultants involved count."

An Assistant Chief Nursing Officer also opined that:
"...safe surgery, staff coverage and ability to cope with workload are the reasons usually considered when taking such decisions."

Publicity Condition

Participants were asked the question "how are decisions for allocating or making changes in operating room allocation disseminated to the stakeholders, and what is disseminated." Research participants' opinions are presented in Figure 2.

Twenty seven i.e. 54% of the respondents were either not aware of the publicity mechanisms or felt that publicity is very poor. Seven, i.e. 14% felt that such decisions are publicized verbally through senior nurses on duty, 5 i.e. 10 % felt that important information is always passed through the Heads of Departments , another 5 i.e. 10% identified that such notices are posted on the notice board for information, 3 i.e. 6 % identified that the Theatre Users Committee (TUC) directly pass such information to theatre users, 2 i.e. 4% identified the use of hospital bulletins and circulars as sources of publicizing pertinent decisions related to operating theatre resource allocation, while only one respondent i.e. 2% strongly felt that decisions on OR allocation are never shared.

Furthermore, participants in the KIIs felt that the mechanism for communicating operating room allocation decisions does not encourage effective communication of hospital management decisions. More than half of the KII respondents felt that the hospital management needs to improve on issues related to the availability and allocation of OR resources. For instance, another consultant surgeon said:
"Scheduling information is passed through the consultants, resident doctors, or nursing staff. Such information focuses on needs already met, but often silent on emerging and critical problems in support of staff-patient friendly decisions."

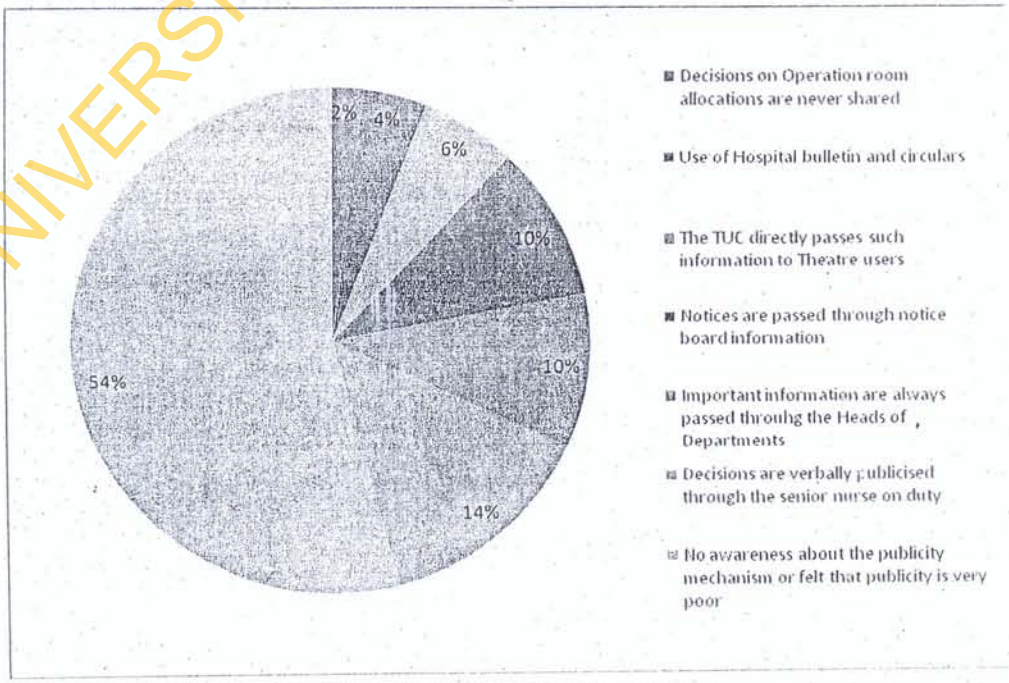

Fig. 2: Appraisal of the OR allocation's fulfillment of the publicity condition

A general surgeon said,
"... Our executives communicate only decisions that meet their goals and usually not the pertinent challenges of surgical patients or the operating team."

Appeal and revisions
Participants were asked the question "What happens if someone disagrees with the allocation?" Research participants' opinions are presented in Figure 3.

Chairman Medical Advisory Committee is contacted, occasionally. But in reality, nobody listens to you if you are a nurse here, unless you are a very senior consultant physician."

According to a hospital administrator,
"..The basis of the disagreement is ironed out and occasionally amended if possible."

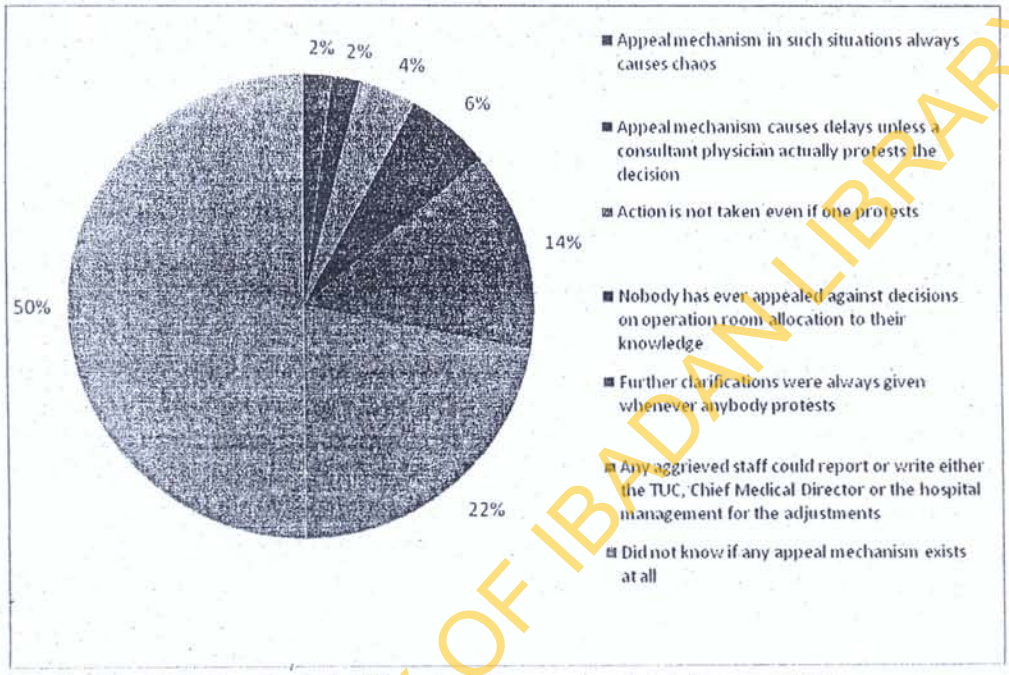

Fig. 3: Appraisal of the OR allocation's fulfillment of the appeal and revisions condition.

Analysis of the semi-structured questionnaire showed that half, 25 i.e. 50% of the respondents did not know if any appeal mechanism exists at all. 11 i.e. 22% of the respondents felt that any aggrieved staff could seek redress through the TUC, and in special instances, the Chief Medical Director for adjustments, 7 i.e. 14% were of the view that further clarifications were always given whenever anybody protests, 3 i.e. 6% emphasized that nobody has ever appealed against decisions on OR allocation to their knowledge, 2 respondents, i.e. 4 % felt that no action is taken even if one protests, 1 i.e. 2% felt that appeal mechanisms cause delays unless a consultant actually protests the decision. One other respondent (2%) felt that appeal mechanisms in such situations always cause chaos.

A Chief Nursing Officer remarked:
"Whenever a surgery unit or individual is not satisfied with a decision, the source of the information, clinical services division or

From a gynaecologist's perspective:
"Most of the time, such disagreements resulted in hot argument or debates, but such scenarios hardly get to the notice of the management as it amounts to a share of waste of time"
These findings suggest that the appeal or revision condition in accountability for reasonableness is very weak in decision-making concerning OR allocation in the hospital.

Enforcement Condition
Participants were asked the question "How are decisions and other processes in fair operating room resource allocation enforced?" Research participants' opinions are presented in Figure 4.
Sixty four percent of the respondents were of the view that no enforcement condition exist, 18% feel that such condition "exists only on paper," 18% feel that it is difficult to enforce decisions or the other 3 conditions, while 8% of the respondents did not respond.

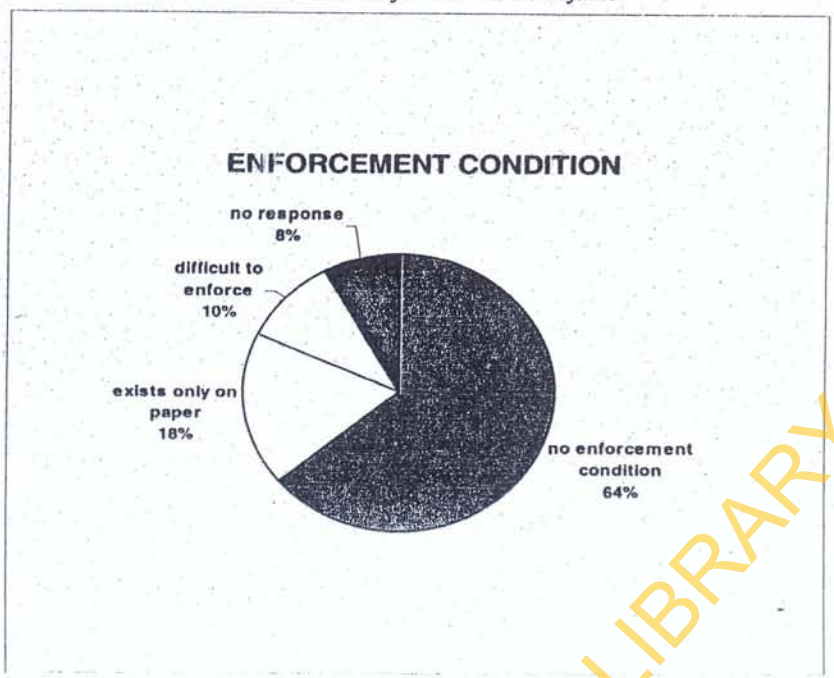

Fig. 4: Appraisal of the OR allocation's fulfillment of the enforcement condition

An anaesthetist expressed her view this way,
"Operating theatre managers have good intentions to make surgery sessions run smoothly. Enforcing this may be difficult within the context of our setting and culture. The consistency may be doubtful here. However, perceived unfairness in resource allocation could be related to poor organizational citizenship behaviour."

Respondents' Suggestions for Improving Decision Making

The semi-structured questionnaire also sought the recommendations of the respondents on how to improve the current operating theatre allocation in the hospital. Their responses were summarized as follows:

1. The TUC and management should hold weekly staff meetings for all theatre users as a medium to pass official information to all stakeholders. As a surgeon puts it:
"it would be unfair to exclude some of the stakeholders in decision-making for operating theatre allocation."
2. The hospital management should improve the supply of surgical equipment and consumables to increase the efficiency in the surgical services of the Hospital.
3. The hospital management should audit cases booked and ORs allocated to determine the utilization of the resources allocated.

Discussion

This is the first case study that examined the fairness of allocation of operating room resources using the ethical framework "accountability for reasonableness" in a developing country. The study revealed that a greater proportion of the surgical staff and hospital executives were ignorant of the framework guiding operating room resource allocation. Many surgical personnel also felt that the modes for communicating allocation decisions were fairly ineffective, with a denial of knowledge of any formal mechanism for appealing against unfavorable decisions. Additionally, the mechanism for enforcing fairness on decisions about operating room resource allocation in this study was found to be weak. These results are important because they evaluate and suggest ways to improve the mechanism for allocating resources in capitally intensive establishments with competing demands typical of surgical services.

The effective running of a hospital unit like hospital theatre depends on a careful management of human and material resources. Any health care institution management process that reduces stakeholders' access to knowledge of decision making process could similarly reduce organizational commitment and belief in organizational goals [16]. In developed health care systems such as in North America, Chief Executive Officers are in charge of running health institutions. This does not fall exclusively within the domain of physicians alone. But in many societies such as in Nigeria attainment

of leadership of the health industry is often a function of membership of the medical profession and political connection. This peculiarity could promote mediocrity, favoritism and reduced cooperation by other team members. The overall effect of this is loss of team spirit and reduced overall efficiency [17].

The participants' claim of ignorance of the decision process in allocating operating rooms could be a reflection of lapses in professional training or inadequacies in post training knowledge update. It could also be a deficiency of the management style in use. Typically, Operating Room Management in profit-oriented health care systems (e.g. USA) emphasizes strategic thinking whereas in countries with publicly- funded health care (e.g. the UK), the focus is on operational decisions [18]. Operating room management should therefore not only be all-inclusive and participatory among stakeholders but additionally utilize available resources to meet organizational goals.

Phillips [17] had argued that the team approach to patient care should be defensible and reasonable to assure the cooperation of all caregivers. High morale is facilitated by adequate staff orientation. Many authors have also asserted the need for nurses to be advocates for care preferences and operational safety within the process of decision-making. [19, 20, 21,] also found that it is necessary to consider nurses' interests in making decisions concerning allocating critical care resources. This becomes relevant due to the fact that it is almost impracticable to render surgical services in the absence of competent supportive peri-operative nursing staff, necessary surgical instruments and other required facilities. It may therefore be said that allocation of operating room to surgeons will not translate into high OR utilization or optimal efficiency without sufficient attention to these factors.

This study found that many surgical team members such as surgeons and a few nurses were involved in operating room resource allocation (Figure 2) . Multiple participants in the decision making process in a study of priority setting in a large university affiliated teaching hospital just like the setting for this study Mielke [10]. However, the extent of involvement of all the participating TUC members in decision making in UCH could not be ascertained. The possibility therefore exists that some members are mal-aligned in decision making for whatever reasons, and this further raises the question of fairness in decision making.

Some participants' responses that their opinions are not respected in appealing against un-favorable decisions in operating room resource allocation agrees with the finding of Thomas, Sexton and Helmreich [22] where they found that nurses perceive their input is not valued in intensive care unit resource allocation. This could occur where physicians dominate decision making or health care administration. It could also occur where power imbalances exist among health care team workers. Mutual respect is the foundation of team work. It is also a right. Respect is exemplified in opportunity for participation in departmental decision making and problem solving [17]. This may suggest a deficiency in the orientation of the respondents to their workplaces and the policies that guide it.

As observed, the present method of OR allocation is a carry-over from the over fifty years' history of the hospital, it may be necessary to suggest modification in the light of present day challenges. The response that personal considerations by managers often influence OR allocation suggests that decision making for OR allocation as found in this study might not be exclusively based on objective and predictable criteria. This becomes more critical when the OR nursing staff on duty uses her discretion to determine which surgeon will be allocated an OR when many emergency surgical procedures are pending[14] .

The poor knowledge and attitude of many respondents in the study may be related to weaknesses of the publicity condition in the procedure for allocating OR resources in the hospital.

Based on the findings in this study, half of the respondents did not know about any appeal mechanism in reacting to unfavorable decisions about OR resource allocation. This may lead to frustration, reduced staff efficiency and ultimately reduced OR utilization.

Limited resources with increasing complexities in surgical services make rationing of OR resources inevitable. Precisely, dwindling human (especially operating room nurses) and material resources required for meeting current challenges of safe surgical care is a growing concern of OR managers. Many organizations have failed to realize the need for evaluating management decisions within the context of management decision processes.

Attaining best practices and efficiency in OR resource management requires a periodic, accountable and multidisciplinary examination of the decision processes in hospitals. People affected by organizational decisions are often left out in such appraisal procedures.

The application of the ethical framework "accountability for reasonableness" in evaluating decision making process and outcome in the course

of allocating ORs is fairly new. This notwithstanding, it is a useful theoretical tool in determining operating theatre users' evaluation of how justifiable management decisions are concerning OR allocation. When this is done, operating room managers will realize better operating room utilization and more efficient use of scarce human and material resources. It therefore strongly recommended for realizing efficiency in managing operating theatres in hospitals as a composite of maintaining an ethical organizational climate.

Conclusion

The most vital element in the improvement of operating theatre efficiency is the development of an effective theatre services management structure that harmonizes patient care demands and available surgical resources. If operating theatre stake holders are excluded in the planning, allocation and evaluation of OR resources, they would be poorly informed, their commitment would be affected and the efficiency required in surgical services would never be realized irrespective of the dexterity of the surgical team.

Surgical suites comprise an important fraction of hospital budget spending. It also often yields greater financial returns. Holding patient safety constant, the opportunity to increase financial gain through modifying the use of already existing resources is a prime target for managerial analysis. Incremental improvements in operating room utilization and operating room efficiency can have major impacts on hospital staff and finances. Some hospital administrators perceive efficiency in the operating room as throughput, completing the most surgical cases within budget.

Although TUCs exist in most hospitals, but their role in ensuring that theatres are used efficiently and effectively is in need of scientific appraisal. Additionally, evaluating management decisions from personnel perspective is required for clinical governance and evidence based care. The relevance of Daniel and Sabin's accountability for reasonableness in such scientific enquiry is becoming more popular in literature. With this, physician, nurses, and patient satisfaction within the context of enhanced organizational efficiency is better assured.

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