Journal of Pharmaceutical Health Services Research, 2021, Vol 12, 133–141
doi:10.1093/jphsr/rmaa030
Research Paper
Advance Access publication 23 January 2021

JPHSR Journal of Pharmaceutical Health Services Research

OXFORD

Research Paper

Pooled procurement program in the quality improvement of medicines of the National Catholic Health Service in Ghana: using the Donabedian model

Kofi Ameyaw Domfeh*

Department of Public Administration & Health Services Management, University of Ghana Business School, Legon, Ghana

*Correspondence: Kofi Ameyaw Domfeh, Department of Public Administration & Health Services Management, University of Ghana Business School, P. O. Box LG 78, Legon, Ghana. Tel: +233-0202806756/+233-0277833600; Email: nanaameyaw84@gmail.com; kadomfeh@st.ug.edu.gh

Received June 29, 2020; Accepted November 30, 2020.

Abstract

Objectives This study evaluates structures that determine the quality of medicines procured through the pooled procurement program (PPP) in the National Catholic Health Service (NCHS) using the Donabedian model. The challenges faced in the PPP are also revealed.

Method A qualitative multiple case study was used to collect information from twenty top- and middle-level administrators in the NCHS through in-depth interviews. After the data transcription, it was then analysed using the thematic content analysis approach.

Key findings The study found that the structures for quality of services in the health facilities are moderately satisfactory. The structures of the NCHS included experienced healthcare workers, adequate physical infrastructures, functional Drug and Therapeutic Committees (DTCs) and a rapid-testing laboratory facility to ensure that medicines procured were of high-quality. This paper established that suppliers of medicines to the health facilities in the NCHS had to register with the NCHS subject to annual renewal. Suppliers are also required to have the Pharmacy Council (PC) and the Food and Drug Authority (FDA), certification to supply medicines to health facilities. However, the predominant challenges that confronted the health facilities were delays in health insurance claims processing and payments, and lack of management commitment in implementing the PPP.

Conclusion The study contributes to the pharmaceutical health services literature in the context of the pooled procurement approach in the sourcing of medical goods in the health sector. Significant implications for research and management are also presented.

Keywords: pooled procurement program; Donabedian model; health sector; medicines; National Catholic Health Service; Ghana

Introduction

In developing countries, most leading causes of morbidities and mortalities can be prevented or treated with high quality and cost-effective essential medicines. For example, 5.5 billion people of the world's inhabitants live in countries with non-existent or low access to medicine for modest to severe pain.[1] These countries are faced with several challenges of providing an uninterrupted supply and consistent access to essential medicines.[2] The weak supervisory

systems, poor implementation of regulatory rules and challenges linked to procurement and supply of medicines serve as a major barrier to medicine accessibility.[2] There is also a substantial influx of poor-quality medicines which denies millions consistent access to essential medicines.[2, 3]

However, the challenges in developing countries are not only limited to the procurement of medicines. The decline in donor funding, shift from communicable to non-communicable diseases and movement from out-of-pocket payments to universal health coverage has necessitated the support of all and sundry.[4] Procurement serves as a tool to improve health and achieve the Sustainable Development Goals (SDGs).[4] To ensure quality in healthcare delivery, procurement of medicines is an essential element of an efficient medicine supply system. Through the partnership, a strong pharmaceutical system can be established with effective leadership and governance to ensure rules are adhered to.

Therefore, collaboration within faith-based organizations (FBOs), to support healthcare delivery is increasingly critical. FBOs act as a constituent of the private-not-for-profit (PNFP) sector and assist in the provision of medicines to complement efforts of the public sector in especially deprived communities in Africa.[2, 5] Their assistance usually comes through the pooled procurement program (PPP). The PPP is described as procuring medicines in wholesale for many purchasers, to decrease the cost of the medicines and is based on economies of scale.[6]

The establishment of PPP by FBOs is seen as one innovative method for dealing efficiently with exorbitant prices. This partnership guarantees economies of scale, robust funding for medicines, well-qualified employees and the reliable supply of medicines, prompt patient information and services that support the rational and safe use of medicines.[5] Also, an efficient PPP guarantees an accurate quantity of supplies (i.e. specifications and quantification) and ensures that all medicines procured to meet the accepted standards of quality.[7] The PPP serves as a measure of a quality tool through the rigorous processes of acquiring medicines.

Quality of services in health care serves as a strategic means for a competitive advantage. The Donabedian model assists in evaluating the quality of health care based on three dimensions of the structure, process and outcomes.[8, 9] The model considers the systemic perspective of the healthcare system comprising structure (inputs), process and output.[8, 9] The evaluation serves as a standard for consistent evaluation and improvement of quality dependent on qualified employees, required equipment, etc. It is expected that good performance by healthcare providers positively affects healthcare outcomes. As a result, the PPP processes must ensure that quality services are provided to ensure clients' safety.

However, a comprehensive review of the prevailing literature on PPP reveals a dearth of empirical studies on how PPP improves the quality of services in health care. Although the limited studies on PPP have broadly focused on detailing the processes, challenges encountered and the establishment of the program (Jaguga, 2018).[2] Other studies used systematic literature review and mixed-method approaches and relied largely on stakeholder theory to examine the PPP (Jaguga, 2018).[5, 10] Meanwhile, other studies evaluated the structure of prenatal care and the quality of youth-friendly sexual and reproductive health services using the Donabedian model.[8, 9] On the other hand, there is still a dearth of evidence from the top- and middle-level administrators of how the PPP improves the quality of healthcare delivery and the challenges encountered in FBOs.

To address the gaps identified above, this study deals extensively with the role PPP plays in the quality improvement of medicines of the NCHS in Ghana. The Donabedian model is employed in this study to get a clear understanding of the structures established to ensure the quality of medicines in the NCHS. So, this study evaluates structures that determine the quality of medicines procured through the PPP in the NCHS using the Donabedian model. The challenges encountered in the PPP are also studied.

This study contributes in three ways. First, this study would contribute to the existing body of knowledge by serving as a new source of reference for researchers and students. This study contributes to the existing body of knowledge of PPP by its introduction of the Donabedian model. Second, the knowledge gained should also assist procurement employees to improve their procurement practices and managers to also collaborate where feasible. Third, this study aims to inform policymakers, to review and adjust procurement processes that ensure effective and efficient PPP.

This paper seeks to evaluate the structures that determine the quality of medicines procured through the PPP. The questions of this study are:

I. What are the structures that determine the quality of medicines procured through the PPP?
II. What are the challenges confronting the PPP?

The rest of this paper is divided into four sections. The first section presents the theoretical literature and conceptual overview of the topic under discussion. The methodology is presented next. The third section discusses the main findings of this study. The fourth section is the discussion and conclusion comprising the implications of the study to theory and management. The limitation of the study and research gap for future study is also presented in the last section.

Pooled Procurement Program: the Antecedent

The concept behind PPP is to improve the procurement outcomes for all its members. The successful implementation of the PPP would guarantee access to improved quality medicines, improved availability and constant supply and reduced transaction costs, and a more efficient and streamlined procurement management system.[2] PPP is a strategy and management methodology to aid increase accessibility to medicines and ensure high-quality medicines to achieve improved health outcomes.

Concerning FBOs, PPP is enormously beneficial to members whose facilities are geologically remote or serve a small population.[2] These healthcare organizations can also pool their capacity to conduct quality assurance supervision and other procurement functions. Their procurement requirements can also be accumulated amongst their service zones to increase the volume of medicines procured and decrease the cost of medicines.[2]

A prevailing network such, as NCHS, must coordinate and collaborate to ensure that such umbrella organizations make decision-making practices and monetary matters more streamlined and efficient.[5] Nguyen *et al.*[11] assert that to find a lasting response to the excessive cost of medicines, strategic procurement and improved collaboration and coordination within FBOs can be the answer to the problems.

PPP is based on four concepts, which shows the stages of collaboration between the members. It comprises information sharing, coordinated buying, group contracting and central contracting and purchasing.[2, 12] Each concept describes a particular mechanism in the accomplishment of advanced stages of the partnership.

The concepts are informed buying (FBOs share information on prices and suppliers but individual FBO procures); and coordinated informed buying (FBOs share information on supplier performance and prices, conduct joint market research, but FBO buys individually). The rest of the concepts are group contracting [FBOs negotiate collectively and suppliers are selected based on a contract. The selected suppliers will purchase on behalf of the FBOs, whereas payment is done independently by the FBO (e.g. Gulf Cooperation Council)]; and central contracting and purchasing [a set-up of the technical working group or central procurement unit to superintend all tendering and awarding of contracts, for example, Pan American Health Organization (PAHO)].

The central contracting and purchasing entail a full commitment to management and policymakers with the support of member groups. This model of PPP characterizes the utmost level of commitment.[2]

Apart from organizations embarking on a particular procurement model, it is also essential that organizations' procurement processes go through a particular cycle that employees are aware of. The procurement cycle comprises ideal processes organizations could embark on when procuring a product, hence, the procurement cycle.

The pooled procurement program cycle

The procurement cycle serves as a quality tool that ensures efficiency in achieving procurement objectives. MSH[7] proposed the ideal procurement cycle every organization can embark on to ensure quality is maintained in its procurement processes.

However, this study builds on the knowledge gained from MSH and suggests a more comprehensive procurement cycle that could guarantee quality assurance in any organization. This PPP cycle (Figure 1) comprises the planning stage, determination of quantities needed, reconciliation of needs and funds, choosing the right procurement method, selecting suppliers, an invitation to tender, adjudication of tender, contract award, reception of the first consignment and reporting, monitoring and evaluation (Figure 1).

In a nutshell, the PPP cycle serves as a quality improvement tool from the planning stage to the evaluation stage. The processes within these stages serve as checks and balances to ensure that processes are duly followed to ensure quality standards. There should be a constant and continuous process of evaluating the performance and all functional areas to make evidence-based decisions to improve the processes and results of the PPP.

Methodology

A multiple case study design of the qualitative research approach was employed for this study. A multiple case study design permitted the reproduction of emerging concepts by the researcher. It also assisted the researcher to categorize comparable characteristics of the phenomenon by exploring the contexts to comprehend the matters under study.[13] Therefore, four cases including three health facilities and the National Catholic Health Secretariat (NCHS) of the NCHS were chosen for this study.

A purposive sampling method was adopted for this study since the NCHS is the only FBOs involved in the PPP in Ghana. The study sampled respondents from NCHS whose mandate and job tasks were consistent with the PPP were interviewed. As a result, the convenient sampling method was employed to select and categorize the core respondents within the NCHS based on their analytical merits and understanding rather than their statistical representativeness.[14, 15] The sampling frame was restricted to NCHS managers accountable for the PPP implementation at the district and national levels.

The chosen health facilities for this study were the worst, average and best-piloted hospitals for the quality improvement program to decrease under-five mortality by two-thirds.[16] The health facilities selected were Our Lady of Grace, Breman Asikuma, St Francis Xavier, Assin Fosu and Holy Family Hospital, Techiman. The NCHS (i.e. the Secretariat) as initiators of the PPP were also interviewed to complement the study. The officials at the NCHS were interviewed to ensure coherence and consistency in the data collected. So where the researcher was in doubt, clarification was given by NCHS.

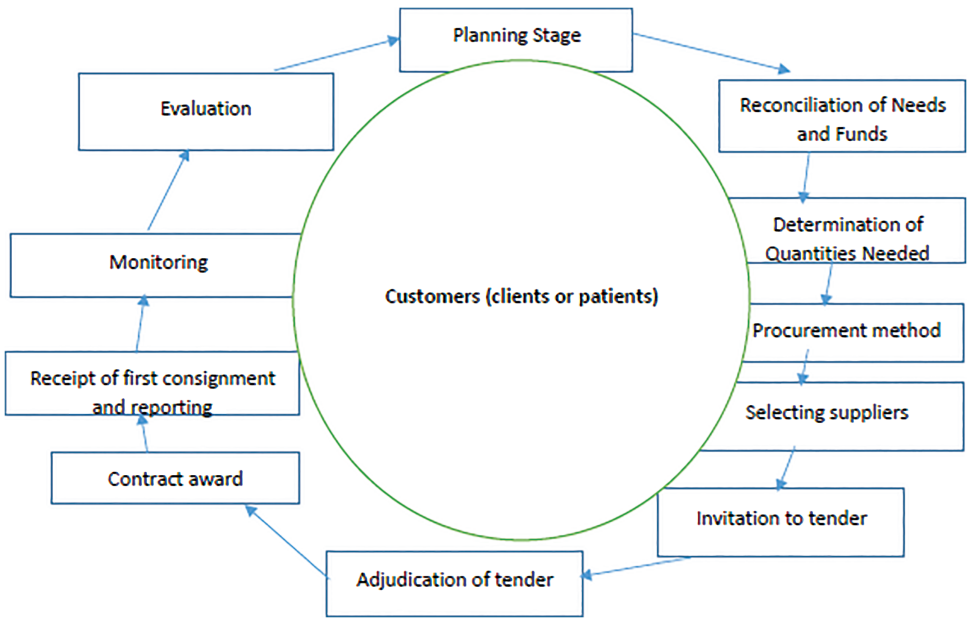

Figure 1 Pooled procurement cycle of medicines.

Through an arrangement of convenience sampling technique respondents were selected.[15] The first contact with the Directorate of Health at NCHS, those who were more knowledgeable in the PPP were pointed out for the interview. A national officer (i.e. Directorate of Health) assistance was solicited in aiding to recruit the respondents for this study. The respondents at NCHS aided in recruiting the respondents at the district levels.

Therefore, challenges of administrative red-tapism, inaccessibility, making contacts and even gaining information from management were made easy through this technique of soliciting information from respondents. After the 20th respondent, sampling ended since saturation was reached (Table 1).

Therefore, the primary data collected comprised in-depth interviews with senior officers at the NCHS, procurement officials and pharmacists, sisters in charge/chief executive officers, health services administrators and storekeepers. The interview guide used was not restrictive and outlined based on the aims and issues revealed through the literature review. The same interview guide was used for the health facilities and NCHS. This was to ensure that the data collected were accurate. The proven ease and efficiency of the administration of interviews were the key reasons for their adoption as a data collection instrument. Interviews with respondents lasted between 10 and 30 min. Interviews held at the offices of respondents were recorded, transcribed and signed by respondents for analysis.

The thematic content analysis method was used to analyse the interview data gathered. The data were rearranged according to the applicable portion of the thematic framework in tune with the research objectives.[17] The mapping and interpretation were influenced by the primary research objectives in addition to the themes that appeared from the data. The five main stages of the data analysis framework were employed for this study. They were familiarization, identifying the thematic frameworks, indexing, charting, mapping and interpretation.[17] The familiarization aided the researcher to explore the raw data by listening to audio recordings, transcribing the audio, taking field notes, reading reports and relevant documents. The main issues and concepts were also coded.

The study used literature data and literature triangulations. The primary data were triangulated with previous literature on PPP policies, articles on Donabedian models and peer-reviewed journal articles from reliable databases from which inferences were made in the discussion.

Ethical approval for issues such as anonymity, confidentiality, informed consent processes, compensation and full disclosure was made to study participants. The implications and use of research findings, discomforts and rights of participants and probable risks were also reviewed. Ethical approval reference numbers ECH 087/18–19 covered the study. The NCHS and hospitals also gave their approval for staff, facilities and programs to be studied.

Table 1 Summary table of sample

Organization	Designation	Number
Health Facilities	Chief Executive Officer/Sister in Charge	1
	Pharmacist	3
	Health Service Administrators	2
	Supply Officers	5
	Finance Officers	2
	Procurement Officer	1
	Accountant	1
	Pharmacy Technician	1
	Store Keeper	1
NCHS	Procurement Officers	2
	Coordinator	1
Total		20

Results

This section discusses the main findings in line with the objectives of the two-fold study: i) to identify the structures that determine the quality of medicines procured through the PPP, and ii) to identify the challenges confronting managers in the implementation of the PPP. The evaluation of the structures from the Donabedian model is also presented.

Structures used to determine the quality of medicines

This article's objective was also to determine the structures set up to certify the quality of medicines procured for the various health facilities. With the aim of the above, the source of medicines was inquired, the consensus was that medicines were procured from the WHO Model Essential Medicines List (EML) and the National Health Insurance Scheme (NHIS) medicines list. The general view of respondents was that medicines supplied essentially conformed to established pharmacopeia standards of quality by the manufacturer and they provided the batch certificates of quality manufacturing, as well as the WHO certificate of medicines. In this regard, a respondent asserted that:

'*Apart from the procurement office coming up with a list, we normally register our suppliers so, at the beginning of the year, you are supposed to come with all your documentation, your tax clearance, pharmacy council certificate, Food, and Drug Authority certificate, and everything. We have created a file for all of them and so all these documents are there and you are supposed to renew them every year, so if it is not up to date then you would not be able to supply*.' (R6, Male, Pharmacist).

The NCHS procurement of essential medicines is also based on professional advice from usually a committee within the health facilities. This committee in the NCHS is the Drug and Therapeutics Committee (DTC).

The DTC is usually responsible for formulary management which involves that formulary medicines are consistent with national accepted standard treatment guidelines (STGs) and conform to ethics. This committee is responsible for medicine selection processes in the various hospitals. Hence, the efficiency of the DTC was inquired from respondents. Their responses are briefly captured:

> Our Drug and Therapeutic Committee (DTC) is functional, we meet every quarter so what we do is we update our medicines list twice a year. So the new ones to be introduced is dependent on the request from the prescribers. Normally we do prescription monitoring here so we monitor it for some time and when we see that they are writing a new medicine we get it onboard. Whatever we select here must be on the WHO Essential List. (R7, Female, Pharmacist).

Another respondent intimated that:

> We have this committee in a place called Drug and Therapeutic Committee (DTC), now it very functional and we meet every quarter and normally towards the end of the year we ask prescribers to come up with the list of medicines they want us to procure and from other specialists as well. Based on that list, we meet as a committee and decide

whether the medicines should be procured for the institution. It is always based on the diseases that are presented to us and of course consumption patterns. (R12 Male, Health Services Administrator).

In affirmation, further response prevailed:

We have our internal formulary. Our selection process is based on our locality and the kinds of diseases and sicknesses we see. We have also developed a list of medicine we feel are needed for us. Then we look-out for quality and affordability. The procurement committee is big but when it comes to drug use I'm not part of the selection process. The selection of medicines comprises the nurses, doctors, pharmacists, and other users. (R11, Male, Supply officer).

At the NCHS, there was a confirmation of the various DTCs at the facilities which ensured that medicines conformed to EML, and they come with their batch certificates of quality manufacturing. A respondent had this to say:

Yes, there is at the facilities level DTC that informs the selection of medicines and at the PPP governance level, we have a procurement committee which involves pharmacists and other professionals who think through the medicines to be procured. (R19, Male, Acting Manager, NCHS).

The quality of medicines changes over time and this is detectable. NCHS needed to be able to evaluate the chemical quality and therapeutic efficacy of medicines to establish their shelf-lives.[18] To ensure the quality of medicines procured, respondents were also asked about the shelf life of medicines during a defined time. The following responses were given:

The medicines get to us in very good time and they come in without any damage to them. (R9, Male, Store Keeper).

Another also pointed out that:

Sometimes they come undamaged and with adequate shelf life. We usually ensure that medicines that have at least six months expiry date are not taken even though we don't expect it to finish. (R8, Female, Supply Officer).

At the NCHS, respondents were asked about the shelf life of medicines during a defined time, the response was:

From our reports from the hospitals, medicines arrive in good condition (R18, Male, Procurement Officer, NCHS).

The establishment of laboratory facilities can also assist in testing substandard, falsified and spurious medicines to ensure compliance. The testing of medicines was also a concern for this study.

The consensus was that medicines were tested, the responses varied across those within and between the health facilities. These respondents intimated:

We procure from accredited pharmaceutical companies and in that way we can vouch for the quality of medicines. Outside that, you might not be able to tell. I might add that if along the line we have any challenge, for example, we have patients complaining about or reporting any adverse effect. What we do is to report it to the Food and Drug Authority (FDA) and they come in for the sample and do their analysis and they give us the feedback. (R2, Male, Health Services Administrator).

Normally when it comes to testing, we open the package and check the expiry date. WHO also has a website and if you are not too sure about the medicine, you can find out from there. Before we accept any product, accounts and user department would be there to check the quality and if it doesn't meet the standard it will be rejected. (R4, Male, Pharmacist).

One of the criterion the program put in place is all medicines that are procured must be certified and registered by the regulator and also because it is a competitive tendering there are times that you may have the brands that are being tendered superior or higher quality than most of the generics that might be on the open market. For that reason, though they may be a bit higher than the open market, the program goes ahead to recommend or award the supplier of such items. (R5, Male, Pharmacist).

The NCHS provided more light in this direction with these responses which confirmed the various responses from the health facilities:

Before you become eligible to tender for medicines you should have registered with Food and Drugs Authority and during the tendering and opening process, we have officials from the Food and Drugs Authority as part of the panel for evaluation (evaluation panel) and samples of medicines are submitted and tested as part of the tendering processes. And after the award, we have a mini-lab that we use to conduct random testing of all medicines that are supplied to all our facilities and the results are forwarded to the Food and Drugs Authority for the necessary processes. Where items are counterfeit or sub-standard medicines are detected or are found, immediately, all those supplies are quarantined until such time that the investigation is concluded and then a new supplier is found to supply. (R20, Male, Senior Coordinator, NCHS).

We have a laboratory (a rapid response laboratory) that we use to analyze or to test medicines samples that we have purposely pick from various facilities and we subject it to the testing protocol and those that we find to be suspicious or substandard are referred to a full-fledged laboratory-like Food and Drugs Authority or Ghana Standard Authority for a confirmatory test. (R19, Male, Acting Manager, NCHS).

We have a mini-lab and train pharmacists to train others. The facilities rely on us to give them the report. We take samples from them to check in our mini-lab and when there is a need we send them to FDA. (R18, Male, Procurement Officer, NCHS).

Challenges confronting the pooled procurement program

The study found many challenges which stretched from insufficient financing of the PPP, lack of management commitment, the supply of substandard medicines, poor inventory management, delays and shortages of supplies. The rest of the challenges comprised a lack of competent employees, exchange rate fluctuation, or higher prices on the PPP than the open market, poor condition of transportation of medicines, institutional politics and resistance to change.

Also, the communication network between health facilities and NCHS was poor, lack of physical infrastructure, lack of monitoring of suppliers facilities by health providers, poor internet accessibility and inadequate coverage of the PPP, the discrepancy between samples and supplied medicines and hospitals owing suppliers after

NHIS reimbursements were also a major concern. However, the main challenges that confronted the health facilities were delays in health insurance claims processing and payments and lack of management commitment in implementing the PPP.

Delays in health insurance claims payments

The constant delays in the dispensing payment of health insurance claims impeded the success of the PPP. Since a greater number of clients of the participating health facilities are enrolled in the NHIS. The delays in the dispensing payment of these insurance claims have cause health providers to renege in honoring their creditors promptly. This situation has affected the relationship between health providers and suppliers in honoring the terms of the contract agreement. This was found in all institutions sampled for this study.

As rightly captured from some of the respondents:

> Payment timing is critical and government payment always delay due to payment issues some suppliers supply expired medicines. Since 85–90% of our clients are on the NHIA, and so 90% of our income comes from national health insurance. Therefore, any undue delays from health insurance affect the financial chain of our ability to pay suppliers on time and because of that sometimes the suppliers are not willing to meet our demands or supply to the facilities. Thus creates some shortages. (R2, Male, Health Services Administrator).

Another respondent said:

> When it comes to the challenges of PPP, delay in reimbursement by the NHIA because the government is always in arrears over a year. Because insurance is not paying, we too we are not paying the suppliers. (R19, Male, Acting Manager, NCHS).

Another respondent confirmed this challenge:

> The delay in payment for suppliers is one of the major challenges of the PPP. And because of that suppliers are sometimes unwilling to supply because of delay in payment. Erratic payment of the NHIA is very disruptive to suppliers, for example, sometimes the payment comes a year after. [R13, Female, Sister in-charge/Chief Executive Officer (CEO)].

The common theme of the long delay of payment by NHIS necessitated the question of how long it took suppliers to get paid. The following responses were illustrative:

> That's a huge problem, in the case of medicines it doesn't take too long but non-drug consumables take too long, sometimes it takes about 6 months to 1 year. In 2016, we came up with a roadmap with the NHIA to settle our drug debts. (R19, Male, Acting Manager, NCHS).

Another respondent intimated:

> That is interesting, it depends on the agreement with suppliers order between 90 days with PPP but when we deal with the individual company we can bargain. But some items they say are pure cash. Averagely it takes less than six months. Currently, we are owing people. (R18, Male, Procurement Officer, NCHS).

The delayed payments of the health facilities brought with it its attendant repercussions such as the reduced capacity of suppliers to supply, the inability of health facilities to test medicines, the supply of substandard or expired medicines and insufficient physical structures. The following responses were explanatory:

> Suppliers are sometimes reluctant to supply because of delay in payment. We depend on the insurance when we are paid that is when we pay our suppliers. When they are presenting their sample, suppliers or manufacturers present a very high-quality sample and because we do not have the wherewithal to check the quality of medicines, the quality can be compromised. The compromise comes because we do not have the structures to test what they supply to us. (R12 Male, Health Services Administrator).
>
> Sub-standard products can be supplied to hospitals because there are no analyzers in the various hospitals or at the institutional level. There are no systems in place to check the potency of medicines. Infrastructure i.e. at most of the facilities, they have been put up years ago so expanding it has become a problem and inadequate storage facility is one. You see, some of these facilities don't have the finances to expand their infrastructure to get more storage space. Some of them have inadequate pellets, shelves, models, stores, and is a whole challenge for some of them and the more government delays their money from coming, the more they may have challenges to expand their facilities. (R18, Male, Procurement Officer, NCHS).
>
> We don't have virtual control over all the PPP systems in our facilities from Accra, where the inventory systems from the facilities could be hooked to the system so that there can be real-time interaction. We don't have an idea about the patronage levels, the prices, and the supply response time or delivery, and all other issues that go on and affect the PPP. So if we can have an idea about the real-time interaction of how the PPP goes on in the facilities it will be helpful (R20, Male, Senior Coordinator, NCHS).

Lack of management commitment

The deficit of medical leadership in the health facilities was also apparent in this study. The respondents disclosed the difficulties they encountered in their daily activity concerning management. As observed by these respondents:

> I can say that it is due to lack of commitment because the booklets are always available and so it is up to management supervision to ensure that officers follow the due process. So I can say that lack of the will on the part of managers of the facilities to ensuring that officers do the right things. (R19, Male, Acting Manager, NCHS).
>
> Centralized nature of the pooled is a challenge which doesn't allow for consultation. Sometimes the hostile nature of our institution for the change you need to sit back and observe. Institutional politics makes it difficult to intervene in procurement practices. Institutional level no systems in place to check the potency of medicines. The suppliers present high-quality samples and may make some medicines available without value for money since the efficacy can't be guaranteed. (R12 Male, Health Services Administrator)

The essential knowledge and expertise of employees were also a major unease. Experienced and competent employees to manage the various departments within the health facilities were also inadequate. This situation was evident in the poor nature of the inventory

management, forecasting demand and supply of medicines. The lack of proficiency in forecasting and calculating demand and supply of medicines generated artificial shortages in the health facilities. These comments were made by respondents:

> Some of the reasons that can be assigned to it is improper to reorder level put in place by procurement officers. Again, at the facilities level most of our procurement officers do not follow the procedures in placing orders, that is, the local purchasing order forms, which is becoming a difficulty for us and we have been trying to impress upon them to stick to that. (R19, Male, Acting Manager, NCHS).
>
> Also, forecasting and demand are not very effective to the extent that they do not place adequate orders from the suppliers so sometimes they can have artificial shortages and interim shortages. Sometimes, their ordering levels become a greater cost to suppliers because they order in smaller quantities or emergency and they need to rush to fill the orders, and sometimes it can create misunderstanding between the facilities and the suppliers. (R20, Male, Senior Coordinator).

Management commitment must ensure resources are adequately available for projects and as such to suppliers. However, health facilities were still in arrears to suppliers long after the NHIS reimbursement. Again, institutional politics and resistance to change were also a major concern for the smooth operation of the PPP. Some respondents intimated the following:

> Some of the facilities owe the suppliers of the program beyond the period the insurance does not owe any of the facilities. And because of that suppliers are sometimes unwilling to supply because of delay in payment. Suppliers are also supplying in bits due to payment and medicines of high value are not been supplied by suppliers. Some suppliers have even threatened to stop supplying the NCHS. (R12 Male, Health Services Administrator)
>
> In this system, people have already taken entrenched positions, so sometimes you ask them to do certain or vary their activities. Somehow, it is not easy and you meet opposition. We complain about the activities of the procurement office and stores sometimes. (R7, Female, Pharmacist)

Discussion

The NCHS is aware of how critical essential medicines are to healthcare outcomes. As a result, it promotes the usage of essential medicines in all its health facilities. They were of a strong conviction that essential medicines will promote health and satisfy the healthcare requirements of the population in their catchment areas.[19, 20] Therefore, the NCHS instituted a policy that guaranteed that health facilities have access to safe, quality and affordable essential medicines to achieve SDG 3.8 which stresses the need to improve medicines to address insistent treatment gaps.[19, 20]

The findings suggest that the DTCs in the various health facilities ensured that clients were provided with cost-effective and quality medicines. The DTC developed and executed an effective and cost-effective formulary system that comprised formulary manual, reliable standard treatment practices and a formulary list.[21, 22] The formulary manual guided practitioners to follow laid down regulations to ensure quality medicines were supplied to the health facilities. The DTCs also ensured that medicines conformed to pharmacopeia standards and medicines procured are on EML or NHIS list. Besides, the NCHS embarked on occasional monitoring and evaluation in their health facilities to ensure their medicines were safe, efficacious and cost-effective and of good quality. The monitoring and evaluation were done to ensure medicines were in good condition and that clients were prevented from adverse drug reactions (ADRs) and prescription errors.[21, 22]

The NCHS realizes the importance to regulate the quality and stability of medicines to guarantee their safety and optimum efficacy. The shelf-life of medicine is described as the time at which the average medicine characteristic (for example, the potency of medicine) remains in an accepted specification after production.[18, 23] Therefore, changes in the quality of the medicines could be evident in the situation of shelf-stability. The health facilities ensured that medicines were kept in good storage conditions and were prevented from elements such as moisture, sunlight or contact with light, the transmission of gases, mechanical pressures, infection by microorganisms, heat, etc., to maintain adequate shelf-life.[23] The cornerstone of fighting substandard, falsified and spurious medicines is strategic quality control testing.[24]

Laboratory testing of medicines to ensure they conform to quality standards is very important to any healthcare organization. The NCHS ensures that they can determine the composition of a medicine that could harm clients. This involved ensuring that suppliers were registered with the Food and Drug Authority (FDA) and had the Pharmacy Council (PC) certificates. The suppliers registered with the NCHS also have to renew their registration each year to ensure quality. Also, at the NCHS, samples of medicines are always tested in their mini-labs and samples also go through the FDA for confirmatory tests when there was suspicion of substandard or falsified medicines. They also conduct post-tender surveillance on suppliers to ensure that suppliers comply with the sustainable goals of the organization. However, the health facilities lacked the mini-labs and analyzers to test the quality of medicines.

To curb the increasing problem of poor-quality medicines, regulatory authorities and enforcement agencies should work in partnership to implement efficient checks and controls.[24] Therefore, FDA and PC should be accountable for effective medicine regulation needed to guarantee the quality, safety and efficacy of medicines. Furthermore, these state agencies are supposed to ensure the accuracy and suitability of the medical information available to the public.[25] They are also supposed to organize and document in-house regulatory processes, such as inspections, internal audits, license registrations, or renewals for all suppliers.[25] The FDA sets the guidelines for suppliers' production, importation, distribution of medicines and monitor ADRs. They also coordinate activity between the NCHS and other government organizations such as the Ghana Standard Authority (GSA). A study conducted by Ndomondo-Sigonda et al.[26] validates the above finding that the establishment of regulatory agencies such as the FDA has seen great improvement in performance, especially improvement in quality control and post-marketing, regulatory capability, surveillance, clinical trials oversight and pharmacovigilance.

The overall view of the structures put in place to guarantee the quality of medicines procured was largely remarkable, even though the health facilities could not test the medicines procured at their various health facilities. To sustain this quality of medicines, there should be a continuous quality improvement even at the facilities level. Also, it is pertinent that NCHS collaborates with international (for example, WHO), local, private and other governmental agencies to provide mini-labs and training for the pharmacists in the various health facilities. It is also essential that suppliers who cannot meet

the demands of the facilities also collaborate with other suppliers to meet such demands.

Management commitment as the literature suggests permit workers to have improved job autonomy, motivates workers to successfully participate in tasks and ensures adequate resources are assigned to projects and guarantees the appropriate physical infrastructures are put in place for the efficient outcome.[27, 28] However, these challenges were likely encountered in the various health facilities as a result of role conflict, poor interdisciplinary associations, poor communication, absence of vision and resistance to change.[29]

Meanwhile, in the health facilities, middle management's commitment concerning quality improvement initiatives in the PPP was not that strong. This absence of commitment could have been instigated by poor staff commitment, the centralization of decisions, absence of worker participation, inadequate training and absence of trust between workers and managers.[30] Therefore, it is up to NCHS to ensure efficient leadership that produces a safe workstation culture and quality patients' care is a priority. A culture that encourages interprofessional cooperation, sets strategic goals for patient safety, supports unions to achieve their objectives, eliminates obstacles for healthcare staff that obstruct safe care and maintains great performance for healthcare suppliers.[31] Management must be committed to any initiative to achieve the anticipated health outcome.

Applicability of the Donabedian model

The Donabedian model, structure, process and outcome instruct that the quality improvement in the healthcare organization must be understood as a comprehensive system and that one part cannot function efficiently in isolation. It is expected that good structure will promote a good process, and eventually results in a good outcome.[9]

The structures of the NCHS that ensured the quality of medicines included its competent employee's insistence on procuring medicines from the EML and NHIS list. All health facilities guaranteed that they had functional DTCs which were responsible for the formulary management. The NCHS was also able to assess the chemical quality and therapeutic efficacy of medicines to establish their shelf-lives through its established laboratory facility. Also, medicines were subjected to a full-fledged laboratory testing by the FDA. Suppliers were also required to have FDA and PC certificates before supplying the various health facilities with medicines. These suppliers have to also register with the NCHS which is subjected to annual renewals by the organization.

This paper concedes that the systems must work in a coordinated and well-integrated manner to achieve their objectives, however, the delayed payments had an enormous impact on the organizational and professional resources in NCHS. This is about the supply of appropriate equipment, making medicines available and employing highly trained personnel to ensure that the right processes were followed to achieve the eventual healthcare outcome.

Generally, the structures for quality of services in the health facilities can be described as moderately satisfactory. However, inadequate funding coupled with a management commitment to the PPP and other non-therapeutic aspects of health services would greatly improve the quality services in NCHS.

Conclusion

This paper contributes and advances the Donabedian's model in the context of PPP of medicines in the health sector. The paper evaluated the structures that determine the quality of medicines procured through the PPP. The paper also reveals the challenges confronting the PPP in the NCHS.

The structures of the NCHS included knowledgeable healthcare workers, satisfactory physical infrastructures, functional DTCs and a rapid-testing laboratory facility to ensure that medicines procured were of high-quality. This paper established that suppliers of medicines to the health facilities in the NCHS had to register with the NCHS subject to annual renewal. Suppliers are also required to have the PC and FDA certification to supply medicines to health facilities. Besides, samples of medicines were always tested and there is also post-tender surveillance on suppliers and post-market surveillance. All the health facilities have DTCs to ensure that medicines conformed to pharmacopeia standards and medicines procured are on EML or NHIS list. However, the health facilities required mini-labs and analyzers to test the quality of medicines.

This paper also established several challenges, however, the predominant challenges that confronted the health facilities were delays in health insurance claims processing and payments and lack of management commitment in implementing the PPP. In the application of the Donabedian model, it was established that the delayed payments of the NHIS had a colossal influence on the structural and professional resources related to the delivery of health care.

Limitation of the study

This paper focused on a homogenous organization such as NCHS, employing the Donabedian model to evaluate the structures of the organization. However, because this paper was limited to the role PPP plays in the quality improvement of medicines, future studies can focus on scrutinizing PPP strategy from the lenses of the stakeholder theory. This will guarantee that stakeholders are well-informed with the challenges of implementation of the program and make necessary modifications through policy. Additionally, a more comprehensive study could have focused on the processes and outcomes of clients. However, this study was limited in that direction and future studies can evaluate the structures, processes and outcomes in other public health facilities or FBOs.

Implications for Research and Practice

The paper presents suggestions for research and practice. The paper contributes to the pharmaceutical health services literature in the context of the PPP of medicines in the health sector. To management, the paper suggests that the vigorous processes of the procurement cycle when adequately followed and monitored in the health facilities would guarantee compliance with the procurement guidelines and ensure quality in the various health facilities. Also, through partnership and collaboration, stakeholders can gain a substantial reduction in the prices of quality medicines for the communities they serve.

As regards research, this paper evaluated the structures that determine the quality of medicines procured through the PPP in the NCHS using the Donabedian model. Therefore, this study contributes to the existing body of knowledge by serving as a new source of reference for students and researchers. Future research can focus on examining the challenges with the implementation of the PPP. This will guarantee that all stakeholders are sufficiently informed of the challenges confronting policymakers.

Author Contributions

The author is solely responsible for all contributions to this article.

Conflict of Interest

None declared.

References

1. World Health Organization. *The Public Health Dimension of the World Drug Problem: How WHO Works to Prevent Drug Use, Reduce Harm, and Improve Safe Access to Medicines*. No. WHO/MVP/EMP/2019.02. World Health Organization, 2019. https://apps.who.int/iris/bitstream/handle/10665/311674/WHO-MVP-EMP-2019.02-eng.pdf.
2. Ghoneim R, Mpundu M, Mabirizi D, *et al*. *Establishing Pooled Procurement Systems among Faith-Based Organizations: A Guidance Document for Successful Implementation*. US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health, 2016. (Submitted).
3. First MDAE, People H. MDS3. *Managing Access to Medicines and Health Technologies*. WHO Drug Information 2014; 26(1). https://www.msh.org/sites/default/files/mds3-jan2014.pdf.
4. Silverman R, Keller J, Glassman A, *et al*. *Tackling the Triple Transition in Global Health Procurement*. Washington: Center for Global Development, 2019.
5. Jalloh I. *The Nature and Extent of Faith-based Involvement in African Pharmaceutical Systems*. Doctoral dissertation, Faculty of Health Sciences, 2019. https://open.uct.ac.za/handle/11427/31482.
6. Waning B, Kaplan W, King AC, *et al*. Global strategies to reduce the price of antiretroviral medicines: evidence from transactional databases. *Bull World Health Organ* 2009; 87: 520–8.
7. Management Sciences for Health. *MDS-3; Managing Access to Medicines and Health Technologies*. Sterling, VA: Kumarian Press, 2011, 18.3.
8. Vizvari P, Dabbaghi F, Mamoodi G, *et al*. Evaluating the structure of prenatal care using the Donabedian model: a study at health centers in Gorgan, Iran. *J Clin Basic Res* 2018; 2: 24–8.
9. Munea AM, Alene GD, Debelew GT. Quality of youth friendly sexual and reproductive health Services in West Gojjam Zone, North West Ethiopia: with special reference to the application of the Donabedian model. *BMC Health Serv Res* 2020; 20: 1–12.
10. Dubois P, Lefouili Y, Straub S. *Pooled Procurement of Drugs in Low and Middle Income Countries*, 2019. http://publications.ut-capitole.fr/32228/1/wp_tse_999.pdf.
11. Nguyen PTQ. *The Role of Trust in Development of Collaborative Buyer – Supplier Relationship*, 2020. https://lutpub.lut.fi/handle/10024/160911.
12. Ferrario A, Kanavos P, Humbert T, *et al*. *Challenges and Opportunities in Improving Access to Medicines through Efficient Public Procurement in WHO European Region*, 2016.
13. Anderson CA, Leahy MJ, DelValle R, *et al*. Methodological application of multiple case study design using modified consensual qualitative research (CQR) analysis to identify best practices and organizational factors in the public rehabilitation program. *J Vocat Rehabil* 2014; 41: 87–98.
14. Yin RK. *Case Study Research: Design and Methods*, 4th edn. Los Angeles, CA: Sage, 2009.
15. Appiah-Agyekum NN. Primary healthcare implementation in practice: evidence from primary healthcare managers in Ghana. *Afr J Prim Health Care Fam Med* 2020; 12: 7.
16. Kumah R. *The Impact of Quality Improvement Effort in Strengthening Healthcare Delivery in Ghana: A Focus on National Catholic Health Association Initiative on Under-Five Mortality Reduction*. Doctoral dissertation, Ghana Communication Technology University, 2016.
17. Pope C, Ziebland S, Mays N. Qualitative research in health care: analysing qualitative data. *BMJ* 2000; 320: 114.
18. Yasmeen A, Sofi G, Khan K. Shelf-lives of drugs in Unani system of medicine: a conceptual review. *J Integr Med* 2020; 18: 114–24.
19. Wirtz VJ, Hogerzeil HV, Gray AL, *et al*. Essential medicines for universal health coverage. *Lancet*. 2017; 389: 403–76.
20. World Health Organization. *World Health Organization Model List of Essential Medicines: 21st list 2019*. No. WHO/MVP/EMP/IAU/2019.06. World Health Organization, 2019. https://apps.who.int/iris/bitstream/handle/10665/325771/WHO-MVP-EMP-IAU-2019.06-eng.pdf.
21. Holloway K, Green T. *Drug and Therapeutics Committees: A practical Guide*, 2018. Reference Source. https://apps.who.int/iris/handle/10665/68553.
22. Ghimire BR, Shrestha S, Adhikari B, *et al*. Establishment and achievements of Drug and Therapeutic Committee at the Oncology-Based Hospital of Nepal. *Ind J Pharm Pract* 2019; 12: 41.
23. Shweta M, Shivshankar R, Vaghela DB. Shelf life evaluation of Laghu Sutashekhara Rasa – a preliminary assessment. *J Ayurveda Integr Med* 2020; 11: 213–6.
24. World Health Organization. Medicines quality: combating unsafe medical products: outcomes of a survey on testing of suspect medicines. *WHO Drug Inf* 2014; 28: 317–23.
25. Reddy GTK, Reddy GNK. Significance of pharmaceutical regulatory bodies - a review. *Pharma Tutor.* 2017; 5: 15–22.
26. Ndomondo-Sigonda M, Miot J, Naidoo S, *et al*. Medicines regulation in Africa: current state and opportunities. *Pharm Med* 2017; 31: 383–97.
27. Pinion C, Brewer S, Douphrate D, *et al*. The impact of job control on employee perception of management commitment to safety. *Safety Sci* 2017; 93: 70–5.
28. Banaeianjahromi N. The role of top management commitment in enterprise architecture development in governmental organizations. *CSIMQ* 2018: 95–113.
29. Daly J, Jackson D, Mannix J, *et al*. The importance of clinical leadership in the hospital setting. *J Healthc Leadersh* 2014; 6: 75–83.
30. Alhaqbani A, Reed DM, Savage BM, *et al*. The impact of middle management commitment on improvement initiatives in public organizations. *Bus Process Manag J* 2016; 22: 924–38.
31. Wysocka M, Lewandowski R. Key competences of a health care manager. *JOIM* 2017; 9: 165–84.