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Procurement planning factors influencing the quality performance of primary healthcare building facilities: A mediation effect of the firm's business partnership

Nuru Gambo^{1*} and Innocent Musonda²

Abstract: The paper reports on an assessment of the mediation effect of a firm's business partnership on procurement planning factors influencing the quality performance of primary healthcare building facilities. A quantitative data collection approach was adopted in the study using structured questionnaires circulated to 520 respondents comprising project managers in the Nigerian construction industry. A stratified proportionate random sampling method was used for the selection of respondents which yielded 370 responses and 357 were used for analysis. Findings were that procurement planning factors influenced the quality performance of primary healthcare building facilities, and the firm's business partnerships mediate the relationship between procurement factors and quality performance of primary healthcare building facilities. This study serves as awareness to governments and other stakeholders in the construction industry on the provision of quality primary healthcare building facilities by leveraging a firm's business partnership as a mediating factor. Findings show that the relationship would enhance the rapid provision of quality healthcare building facilities for the growing population of



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PUBLIC INTEREST STATEMENT

Quality performance of any project is directly associated with the procurement planning at the initial onset of the project, demanding a very high performance of the project. However, poor procurement planning influences the quality performance of any project. Therefore, there is the necessity to provide quality primary healthcare buildings in developing countries and, this seems to be non-achievable because of poor procurement planning policies. The need to provide quality healthcare services for all and also the prerequisite for business partnership among the stakeholder firms involve in healthcare service provision serve as a necessity to effective procurement planning. This paper developed a model using the concept of mediation analysis that tests the degree of the effect of poor procurement planning on the quality performance of primary healthcare buildings and also the analysis tests the intervening (mediation) effect of a firm's business partnership.

Nigeria and other developing countries facing similar shortages of quality health-care building facilities.

Subjects: Construction Economics; Building Project Management; Construction Business Management

Keywords: partnership; procurement; healthcare; building; nigeria

1. Introduction

The global decline in the quality performance of primary healthcare buildings has been witnessed and reported over the last decade. Poor quality performance of primary healthcare building facilities is one of the major factors influencing the adequate provision of healthcare services in developing countries (Mak et al., 2007; Oyedele et al., 2003; Talib et al., 2011). The problem of poor-quality performance of primary healthcare buildings is partly attributed to poor procurement planning which includes; lack of proper priority given to the procurement planning phase, poor procurement planning, non-adherence to procurement plans, and ill-planning that result in untimely procurement of building facilities. The poor health facilities contribute to high maternal mortality and morbidity in developing countries (Akintoye et al., 2003; Bond & Tait, 1997).

Primary healthcare building facilities are construction accommodations provided within the community of people for making an initial approach to a medical practitioner or clinical advice and treatment. According to Gambo et al. (2016a) the function of primary healthcare buildings is to provide immediate accommodations for healthcare services within the communities in a country. In Nigeria, National Primary Health Care Development Agency (NPHCDA) reported that there was a deficit of quality primary healthcare building facilities, which were estimated at 200,000 units and a potential cost of US\$ 180 Million in 2018. This indicated a deficit increase annually of about 90,000 units (National Primary Health Care Development Agency NPHCDA, 2019). Similarly, Ideal Clinic Monitoring System, ICMS (2018) an initiative that started in 2013 to improve quality performance and efficiency of Primary Health Care (PHC) in South Africa estimated that a cumulative 1507 of the 3434 primary healthcare buildings attained ideal clinic status. Likewise, the total number of functional PHC building facilities in India in 2017 was estimated at 14.12% of the total PHCs functioning in the country compared to 82% in the United Kingdom (Durdyev et al., 2017; Iqbal et al., 2015; Kazandjian et al., 2003; Mortimer et al., 2018).

Poor quality performance of PHC building facilities is becoming a global but more so in developing countries. The poor quality of PHC building facilities for the growing population in developing countries like Nigeria is alarming (Gambo et al., 2019). Problems include, for example, the gaps between supply and demand of quality PHC accommodations, poor quality PHC buildings, PHC building quality, socio-economic and cultural appropriateness problems, as well as environmental problems associated with provisions of PHC building facilities. Meng and Hall, (2006) argued that poor site location of PHC building infrastructure, visual impact, layout, and landscaping problems are the most important factors influencing the quality performance of PHC building facilities (Lanrewaju, 2012). While Ibem and Amole (2011) viewed sizes, maintenance, and sustainability, external factors such as noise, accessibility, adaptability, and light as the major factors affecting the quality performance of PHC building facilities.

This problem continues to pose a danger to the growing population in developing countries ((Doppelt, 2017)). A key area to explore to reverse the trend is to relook the procurement approaches. McMichael (2000) notes that since the 1960s, most international agencies and players in the health-care deliveries have advocated for better procurement planning routes for PHC building facilities. PHC building facilities procurement systems are bedevilled with many challenges which include poor procurement planning system (Gambo et al., 2019; Fraser et al., 2003; Gallien and Wein, 2005). Meng and Hall, (2006) contend that ill-planning is the major procurement planning factor influencing the quality performance of PHC building facilities. Other problems and issues include the evaluation of

relevant costs and benefits (McMichael, 2000). However, the concept of quality performance management encompasses economic partnerships as well as behavioral outcomes.

Quality performance management is a process of systematic management of resources for greater value, innovation, and productivity (Raouf & Al-Ghamdi, 2020; Sa'eed et al., 2020). Quality performance is seen as an achievement of quality output within an organization concerning its set goals. Organizational quality performance could be achieved mainly through economic partnerships (Mortimer et al., 2018). Therefore, partnership with a service provider or a construction firm is one of the ways of achieving quality performance of PHC building facilities. Therefore, in the study, we argue that better PHC facilities can be realised with a procurement strategy that has an element of partnership with a suitable service provider or contractor.

The following were the objectives of the study:

- (1) To investigate the procurement factors influencing the quality performance of PHC building facilities in Nigeria.
- (2) To assess the mediation effect of the firm's business partnership on procurement planning factors influencing the quality performance of PHC building facilities in Nigeria.
- (3) To model the relationships between procurement planning factors, the firm's business partnership as a mediator, and the quality performance of PHC building facilities in Nigeria.

2. Procurement planning factors

The concept of procurement planning captures the idea of identifying and consolidating requirements which include determining the timeframes for the procurement with the view of having value for money (*vfm*) through a quality performance of the facility. Studies across Europe, as well as other developing countries, indicated that only 2–5% of public procurement budgets were allocated towards updating procurement planning practices to ensure quality performance (Doppelt, 2017; Edmiston, 2003; Kaisara and Pather, 2011). However, few studies have considered the influence of procurement planning factors and the role of partnership towards achieving the quality performance of projects.

A proper procurement planning process enhances the quality performance of projects. However, this is not feasible, particularly in developing countries. This is possibly due disintegration of the concept of business partnership most especially during the procurement process and the disregard of the major factors influencing procurement planning. Taylor (1998) assessed the different procurement planning options available in the UK defence industry, to overpower the associated challenges the study conceptualized a framework for procurement partnership. The framework assessed only the differences among the procurement options without regard to a vital component of procurement partnership.

Bienhaus and Haddud, (2018) identified the issue of improper identification and prioritization of procurement planning of PHC building facilities as the major factor influencing the quality performance of the clinics. However, Bienhaus and Haddud's, study did not assess the mediation effect of the firm's business. While the study of Wesseling and Edquist (2018) argued that poor procurement planning and inadequate participation of all project stakeholders were the major factors influencing the quality performance of PHC building facilities in most European Countries. Equally, Wesseling and Edquist's study did not assess the effect of procurement planning factors on the quality performance of the projects.

The study that addresses the issue of procurement includes that of Čudanov et al. (2018) who argued that the problems of non-adherence to the procurement plan, ill-planning of timely procurement are the major factors influencing the quality performance of PHC facilities in Serbia. Yet, this study did not consider the mediator variable to reduce that effect. On the other hand, in Saudi Arabia, Bahaddad et al. (2018) identified the level of evaluation of relevant costs and benefits, along with an assessment of risks, and non-price attributes as major factors. The study

by Humphries and Wilding (2001) viewed the quality of PHC facilities as being influenced by a lack of sustainability and irrelevant procurement planning information. The effect of procurement planning is vital in achieving the quality performance of projects.

Similarly, during the procurement phase of any building, sustainable energy efficiency is a critical planning factor and previous studies linked sustainability factors to successful procurement. For example, in a study of energy efficiency assessment of public building resourcing, a Building Information Model (BIM), Rodrigues et al. (2020) developed a Building Energy Model (BEM) which comprised all energy-related information and the model demonstrated to be a useful tool for energy management in public buildings. Moreover, Silva-Afonso et al. (2011) added that sustainable water efficiency in buildings, was not only a means for rational use of water but was also a significant contributor to the energy efficiency of buildings and reduces the emission of greenhouse gases. However, the study on the nexus of water and energy for hotel sector efficiency Pinto et al. (2017) found that five and four-star hotels guarantee high comfort and quality of their services lead to high energy and water consumption per user. The study found that the application of water reducing devices to be a cost-effective method with a great potential to decrease water and energy use in the hotel sector with almost a 35% drop of total consumptions.

3. Construction firm's business partnership

The significance of partnership has emerged in part because government considered that the modern view of best procurement planning practices in some of the private sectors that contractor could often benefit from entering into a long-term collaboration with other sub-contractors and suppliers, the partnership strengthens the firms' competitive advantages as well as increases profits, and meets clients' most critical business needs through the quality performance of products (Berkelmans & van Oppen, 2006). Partnerships entail an enterprise among the stakeholders or partners, so this study assesses the mediation effect of partnership on the poor procurement planning factors that affect quality performance of primary healthcare building facilities.

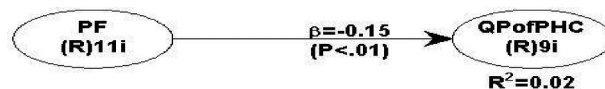
The concept of partnering keeps together partners for long run business activities through rewards for better services. Better services in a complex industry like construction enhance long time relationships among stakeholders involved in the project. The partnership also ensures that business partners have the advantages of becoming future leaders in the business by attracting highly motivated and qualified employees. This strengthens the firm's partner relationships to help improve the firm's business opportunities as well as improved products and services. Berkelmans and van Oppen (2006) viewed the flexibility of partners in business as the ability to compromise, partners with the same goals and different ideas. The study does not assess the mediation effect of a firm's business partnership. Ford et al. (1998) stated that a business network in partnership allows prompt decision making in the hands of every partner, this avoids delays of project realization. This study only ranked the indicators based on the relative importance index but does not assess the influence of the constructs towards minimizing the effect of poor procurement planning factors.

Therefore, a business needs to have partners on board and working on any particular project, if there is a change of leadership in one of the partnerships, the entire partnership would progress. In the commercial sector of the global economy, Bettencourt et al. (2002) stated that about 75% of small construction businesses in developing countries are mostly a sole business, characterized by problems of poor delivery of quality projects, time and cost overrun which resulted in poor quality performance of the project. Therefore, there is a need for small and medium construction businesses in developing countries to partner together, this would enhance productivity and improve the quality performance of projects.

4. Quality performance of phc building facilities

The concept of quality performance of PHC building facilities typically focussed on the value of design and the level of conformance to the specifications (Beneke et al., 2013; Bowen et al., 2002;

Figure 1. Model for the direct effect of PF on QPofPHC.



Kasabreh & Tarawneh, 2019). Quality performance of any project is one of the measures of project success. The quality of design also includes the level of different features of the facilities that satisfy the need and within the budget of clients (Enshassi et al., 2012; Storbacka et al., 1994). Project design is the traditional method of procurement planning of PHC facilities viewed the quality of design and construction as the most important factors influencing *vfm* (Dikmen et al., 2005; Philips-Ryder et al., 2013; Poll, 2007). Project design is an early phase of the project where a project's key features, structure, criteria for success, and major deliverables are planned out. The main target at this phase is developing designs that could be used to achieve the desired goals. Similarly, Olatubara and Fatoye (2007) viewed that the 'level of conformance to design and specifications of PHC facilities as the major factors influencing quality performance. The study does not assess the mediation effect of partnership on procurement planning factors that influence the quality performance of primary healthcare building facilities. Mortimer et al. (2018) stated that the quality performance of PHC facilities includes the consistency of the original product and/or service with the design and specifications as well as the competence, integrity, and promptness of workmanship to realize the goals. But the study does not introduce a mediator variable (firm's business partnership) to mediate the relationship between the major constructs. Mohit et al., (2010) viewed the quality of PHC infrastructure as an adequate level of conformance to specifications and needs to be expanded to capture the experience of the construction firms and the benefits the end-users derived from the products. Quality performance can be assessed through measurements of quality factors of the products, statistical sampling of the output of processes, or through surveys of quality factors for goods or services.

Based on the research objectives, works of literature reviewed and concept of mediation analysis the following directional hypotheses are developed for this study:

H1: There is a significant causal effect between the procurement planning factors and the quality performance of PHC building facilities in Nigeria.

H2: There is a significant indirect effect between procurement factors and construction firm's business partnerships in Nigeria.

H3: There is a significant indirect effect between a construction firm's business partnership and quality performance of PHC building facilities in Nigeria

H4: Construction firm's business partnership mediates the relationship between procurement planning factors and quality Performance of PHC building facilities in Nigeria.

4.1. Research method

This study is quantitative in approach; a questionnaire survey was administered to 520 certified and registered project managers with the chartered institute of project managers of Nigeria (CIPMN). A total of 520 questionnaires were administered of which 370 were returned, and 357 used for the analysis. 20 questionnaires were rejected due to the problems associated with responses, like ticking of more than one (1) option to a question and/or leaving a blank answer space. A Warp6 PLS algorithm was used to perform the regression analysis of the collected data. Warp 6.0 PLS-SEM algorithm was used for analysis and the software helps researchers in making a proper interpretation of results and guides in making the right decisions (Awang et al., 2015; Kock, 2014). The collected data were bootstrapped to generate confidence intervals of the

mediation effect of the firm's business partnership factors. The bootstrapping approach generated an empirical representation of the sampling distribution of the effect by treating the original sample size as a representation of the population in minuscule; this is repeatedly resampled during analysis as a means of copying the original sampling process (Hayes, 2009). The bootstrapping is used to obtain accurate estimates of parameters and standard errors (Awang et al., 2015). The resample was generated up to 999 from the original data with replacement. Bootstrapping is used to generate the confidence interval of the mediation effect of firm business partnership factors on procurement planning factors that influence the quality performance of PHC facilities at a 5% level of significance. The study achieved the return and response rates of 71% and 67%, respectively, as against the studies of Madushika et al. (2020) with 46.7% and that of Najib et al. (2020) with only 32% in the related area of study.

5. Questionnaire development

The primary research instrument for this study was a questionnaire. The questionnaires were administered to obtain data on respondents' relating to the three major constructs of the study: Quality performance of PHC facilities (QPofPHC), procurement planning factors (PF), and construction firm's business partnership factors (FBP). The questions asked were closed-ended, this ensures reliability, and the questionnaire was earlier validated by experts in the project management area of research (Gambo et al., 2017; Guthrie, 2010). Content validity for any questionnaire is described by Sekaran and Bougie (2011) which stated that the validity is used in research to validate the research instruments used for the study. Content validity is used to assess how well an idea or concept is represented by the items/indicators in a questionnaire. The content validity for this study was conducted by requesting experts in the field of project management research and academics on the suitability of the items in the questionnaire. After thorough discussions, the experts validated, verified, and agreed on nine (9) items under QPofPHC constructs, eleven (11) items under PF, and eight (8) items under FBP constructs. The factors in the questionnaire were adapted from past literature as shown in Table 1.

The questionnaire used 5-point Likert scales to rate the responses on the constructs QPofPHC, PF, and FBP. The response scales were based on 1 to 5 scales that measure the level of quality performance of PHC building facilities, i.e., from the very low—very high-quality performance of PHC buildings facilities. Similarly, for the PF construct scales 1 to 5 were also used that rates the severity of PF indicators on the quality performance of the building facilities, i.e., from no severe effect to extremely severe effect. Finally, a 5-points Likert scale was also used to rate the scores for the FBP construct. The scales ranged from very low impact to very high impact of the construct to mediate the relationship between PF and QPofPHC.

6. Construct development

A construct is a theoretical entity or concept which aims at either explaining empirical data on a phenomenon or at conceptualizing unobservable elements to formulate (aspects of) a theory (Sekaran & Bougie, 2011). It further explains a set of inter-relationship among the variables in a model. This study entails three sets of inter-related constructs PF, FBP, and QPofPHC building facilities. The constructs were adapted from the past studies as indicated earlier in Table 1. Therefore, this study introduced the construct FBP to mediate the relationship between PF and QPofPHC based on the concept of mediation presented by Baron and Kenny (1986) causal steps.

7. Assessing mediation effect of firm's business partnership

An assessment of the mediation effects on a model is achieved by adopting a causal steps test: Causal steps were presented by Baron and Kenny (1986) as follows:

Baron and Kenny (1986) suggested some important causal steps test for mediation effect, namely:

- The direct effect between the independent variable PF and the dependent variable QPofPHC should be significant.
- The effect of independent variable PF on the mediator FBP and mediator FBP on dependent variable QPofPHC must be significant; and
- The magnitude of the direct effect between independent variable PF and dependent variable QPofPHC after including mediator FBP should not be significant or reduced.

8. Results

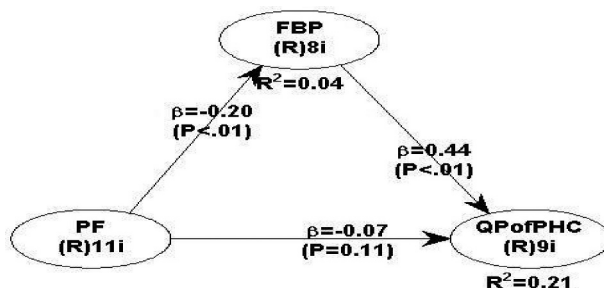
Table 2 indicated that 56.02% of the respondents were from the public while 43.98% were from private sectors of the Nigerian economy. Also, 23.53% of the respondents had Ph.D. degrees, 33.61 had master’s degrees and 42.86 had Bachelor’s degrees. The average years’ experience of the respondents was 12.40 years.

9. Measurement model and factor analysis (direct effect)

Table 2 shows the assessment of the model which typically follows two steps, namely: the assessment of the measurement model which examines the factor loadings validity and reliability of the measurement instrument and relationship among the constructs and assessment of structural model (Chin, 2010; Hair et al., 2011, 2011). The model for direct effect has 2 reflective constructs, namely: QPofPHC and PF. All the two (2) constructs are first-order constructs. The reflective measurement model evaluates the reliability and validity of the model. The two criteria are composite reliability (CR) and the average variance extracted AVE (Chin, 2010; Hair et al., 2011). On the other hand, the indicator and construct reliability were assessed to evaluate the reliability of the reflective measurement model for structural equation modeling. The indicator reliability was evaluated by cross-checking the loading of each indicator variable on its associated latent construct and the loading should be higher than 0.70 before accepting the reliability of the indicator variable (Hair et al., 2011; Hulland, 1999). In the assessment of construct reliability, two coefficients are considered, i.e, composite reliability (CR) and Cronbach’s alpha (CA) (Bagozzi and Yi, 1988; Chin, 2010; J. Cohen, 1988). Hair et al. (2011) recommended CR for PLS-SEM. Table 3 shows the results of the measurement model of this study which indicated high internal consistency and reliability. The indicators loadings were all >0.70 and both the CR and CA ranged from 0.920 to 0.944 for CR while CA was 0.902 and 0.935 for both QPofPHC and PF, respectively. The AVE values for this study were 0.563 and 0.609 for QPofPHC and PF all above 0.5 thresholds. This shows that all the indicators’ reliability and convergent validity were acceptable for the direct effect.

Table 4 indicates the discriminant validity of the measurement model. The discriminant validity is the extent to which construct is distinguished from other constructs in the model (Chin, 2010). This is achieved through checking of the AVE of each construct and must be higher than the highest squared correlation of the construct of any other construct in the model or the loading of an indicator with its associated construct must be higher than that with another construct (Chin, 2010; Fornell & Larcker, 1981; Hair et al., 2011). The results indicated that the square root of AVE for each construct with its correlation to another construct is acceptable discriminant validity of

Figure 2. Model for the indirect effect of PF on QPofPHC and total effects through FBP.



the measurement model. Base on the results of the measurement model the questionnaires were valid in the assessment of the study direct effect constructs.

10. Assessment of structural model (direct effect)

Figure 1 shows the path coefficient between PF and QPofPHC was -0.15 at P -value < 0.01 which is regarded as significant at the $P_{0.05}$ level of significance. This satisfied the first causal step of mediation presented by Baron and Kenny (1986) which stated that the direct path effect between independent variable PF and dependent variable QPofPHC should be significant.

Table 5 shows the R-square (R^2) measure of endogenous latent variables (constructs) and the path coefficients of the model. The model is evaluated as a part of the preliminary assessment of structural relationships, i.e., inner model and hypothetical framework (Chin, 2010; Hair et al., 2011). The path coefficient must be significant for a valid relationship and is the coefficient of determination. Chin (1998) suggested 0.67, 0.33, and 0.19 as substantial, moderate, and weak measures for R^2 respectively. The R^2 for this study is 0.024 which indicated a weak relationship between criterion and predictor variables with P -value QPofPHC and PF $p < 0.01$ which is significant at $P_{\leq 0.05}$ level of significance and path coefficient β value of -0.155 , which was significant. The effect size (f^2) is a measure that verifies whether the effect indicated by the path coefficient is low, moderate, or high if the f^2 values are 0.02, 0.15, and 0.35, respectively (J. Cohen, 1988). Effect size f^2 indicates the effect of the independent construct on the dependent latent variable is substantial (Chin, 2010). The f^2 between QPofPHC and PF was 0.0240 which was low. The predictive capability of each endogenous construct in the model is Stone-Geisser's Q^2 (Hair et al., 2011, 2011). The predictive capability of this model was 0.025 and Warp PLS-SEM automatically generates Q^2 (Kock, 2012). Therefore, this model exhibits predictive relevance because the $Q^2 > 0$, and hence the prediction capability is high (Chin, 2010; Hair et al., 2011).

11. Measurement model and factor analysis (indirect effect)

Table 6 shows the assessment of the second and third causal steps of reflective measurement model analysis. As earlier presented the measurement model examines the validity and reliability of the measurement instrument and relationship among the constructs. The model for this section of the study had three (3) reflective constructs, namely: QPofPHC, PF, and FBP. All the three constructs are first-order constructs. Table 6 shows the results of the measurement model for the indirect effect of this study which indicated high internal consistency and reliability. The indicators loadings were all > 0.70 and the CR was 0.920, 0.944, and 0.963 while the CA was 0.902, 0.935, and 0.956 for QPofPHC, PF, and FBP, respectively. This shows that all the indicators' reliability was acceptable. The AVE values for this section were 0.563, 0.609, and 0.765 for QPofPHC, PF, and FBP, respectively. Therefore, the convergent validity of the measurement model is highly acceptable.

Table 7 shows the discriminant validity of the measurement model for indirect and total mediation effects. The results indicated that the square root of AVE for each construct with its correlation to another construct is acceptable discriminant validity of the measurement model for indirect and total mediation effects. Base on the results of the measurement model for indirect and total mediation effects, the questionnaires were reliable and valid in the assessment of the three constructs.

12. Assessment of results for the structural model for indirect effects through fbp and total mediation effect

Figure 2 shows the path coefficients for indirect effects between PF and FBP were -0.20 , then between FBP and QPofPHC was 0.44 all significant at P -value < 0.01 which is regarded as significant at $P_{0.05}$ level of significance. This satisfied the second causal step of mediation presented by Baron and Kenny (1986) which stated that the effects of independent variable PF on the mediator FBP and mediator FBP on dependent variable QPofPHC must be significant. The third step which is the total effect after the inclusion of the mediator, the algorithm software runs for all constructs after

Table 1. Respondents demographic profile

Project Managers	No.	%	Cumulative %	
Public sector	200	56.02	56.02	
Private sector	157	43.98	100	
Total	357	100		

Educational Qualifications				
PhD	84	23.53	23.53	
Msc	120	33.61	57.14	
Bsc	153	42.86	100	
Total	357	100		

Years of Experience				
Years	Mid Value (x)	Frequency (f)	% of Frequency	fx
5–10	7.5	87	24.37	652.50
10–15	12.5	110	30.81	1375.00
15 and Above	15.0	160	44.82	2400.00
Total		357	100	4427.50

Mean of years of experience $\Sigma fx/\Sigma f = 4427.50/357 = 12.40$ years' mean experience

the introduction of the mediator FBP, and the total path coefficient was -0.07 at $P_{-value} = 0.11$ which is not significant at the $P_{0.05}$ level of significance. Therefore, this satisfied the third causal step which stated that the magnitude of the direct effect between independent variable PF and dependent variable QPofPHC after including mediator FBP should not be significant. Hence based on the conditions of causal effect presented by Baron and Kenny (1986), full mediation has taken place.

13. Assessment results for the structural indirect and total mediation effects

Table 8 indicates the R-square (R^2) measure of endogenous latent variables for indirect and total mediation effects. The model was evaluated as a part of the preliminary assessment of structural relationship as done in the direct effect model presented earlier, i.e., inner model and hypothetical framework (Chin, 2010; Hair et al., 2011). The path coefficient must be significant for a valid relationship and is the coefficient of determination. We have seen that Chin (1998) suggested 0.67, 0.33, and 0.19 as substantial, moderate, and weak measures for R^2 respectively. The R^2 for the indirect and total mediation effects were 0.04 and 0.21 which indicated weak relationships for both indirect and total mediation effects. The path coefficients were -0.20 and 0.4 for the two indirect effects $PF \rightarrow FBP$ and $FBP \rightarrow QPofPHC$ all significant at the $P_{0.05}$ level of significance. Then the path coefficient for total effect $PF \rightarrow FBP \rightarrow QPofPHC$ was -0.07 not significant at the $P_{=0.05}$ level of significance. This satisfied Baron and Kenny (1986) causal steps and mediation has occurred.

The effect size (f^2) is a measure that verifies whether the effects indicated by the path coefficient are low, moderate, or high if the f^2 values are 0.02, 0.15, and 0.35, respectively (J. Cohen, 1988). Effect size f^2 indicates the effect of a certain construct on the dependent latent variable is substantial (Chin, 2010). The f^2 for the indirect path was 0.010 and 0.196 regarded as low and moderate effects, respectively, and the total mediation effect was 0.039, which was low, and this satisfied the second and third Baron and Kenny 1986 indirect and total effects causal steps. Hence, mediation had occurred. The predictive capability of each endogenous construct in the indirect and total mediation effects model is Stone-Geisser's Q^2 (Hair et al., 2011; Hair et al. 2012). The predictive capability of this model was 0.205 and 0.039 for indirect and total effect paths. This automatically generated Q^2 (Kock, 2012). Therefore, the indirect and total mediation effect models exhibit predictive relevance because the $Q^2 > 0$ and hence the prediction capability is high (Chin, 2010; Gambo et al., 2016b; Hair et al., 2011).

Table 2. Development of the construct for the study

(A)Quality Performance of Primary Health Care Infrastructure Facilities (QPofPHC)	Adapted from:
A.1. Gaps between PHC supply and demand	Beneke et al. (2013). Dikmen et al. (2005). Olatubara and Fatoye, (2007), Mortimer et al. (2018), Spierings and Ache (2018), Al-Yahya & Panuwatwanich, (2018).
A.2. Economic issues with regards to PHC performance	
A.3. Socio-economic and cultural appropriateness of patients	
A.4. Environmental problems associated with construction of PHC centre	
A.5. Poor site location and layout	
A.6. Quality of design	
A.7. Functional specifications	
A.8. Clarity of project mission	
A.9. Skills and competency of construction firm	
(A)Procurement factors (PF)	Doppelt (2017) Edmiston (2003), Kaisara and Pather, (2011), Taylor (1998), Bienhaus and Haddud, (2018), Wesseling and Edquist (2018), Čudanov et al. (2018), Bahaddad et al. (2018), Humphries and Wilding (2001), Gil-Garcia et al. (2014)
B.1. Improper prioritization of procurement	
B.2. Poor procurement planning	
B.3. Non-adherence to procurement plans	
B.4. Ill-planning and untimely procurements	
B.5. Poor evaluation of relevant costs and benefits	
B.6. Inadequate assessment of risks, and non-price attributes	
B.7. Incredible mechanisms for addressing procurement related complaints	
B.8. Irrelevant procurement information	
B.9. Lack of sustainability of right procurement route	
B.10. Inadequate participatory of all project stakeholders	
B.11. Inaccurate contract timelines	
(A)Firm business partnership factors (FBP)	Berkelmans and van Oppen (2006), Bettencourt et al. (2002), Ford et al. (1998), Classen et al. (2012), Corsten and Felde, (2005), Heckman et al. (2010)
C.1. Strengthen the firms' competitive advantage	
C.2. Increases profit margins	
C.3. Flexibility of partners in construction business	
C.4. Prompt decision making	
C.5. Reinforced positive idea interaction	
C.6. Adoption of desired workforce training behaviors	
C.7. Improve positive return on investment	
C.8. Enhances value for money	

14. Discussions

This study assessed the mediation effect of FBP on PF influencing QPofPHC within the Nigerian healthcare sector of the economy. The three study constructs were the quality performance of primary healthcare building facilities, procurement planning factors, and the firm's business partnership factors. This study used the concept of mediation analysis to mediate the effect of poor procurement planning factors influencing the quality performance of primary healthcare building facilities. Three causal steps of mediation were adopted based on Baron and Kenny (1986) test of mediation. The first step indicated that there was a significant negative path

Table 3. Results of the measurement model evaluation for a direct effect of PF on QPofPHC

Construct	Items	Factor Loading	CR	Cronbach's Alpha	AVE
QPofPHC	A.1	0.995	0.920	0.902	0.563
	A.2	0.943			
	A.3	0.958			
	A.4	0.999			
	A.5	0.959			
	A.6	0.959			
	A.7	0.990			
	A.8	0.989			
	A.9	0.993			
PF	B.1	0.958	0.944	0.935	0.609
	B.2	0.958			
	B.3	0.992			
	B.4	0.992			
	B.5	0.991			
	B.6	0.999			
	B.7	0.993			
	B.8	0.965			
	B.9	0.999			
	B.10	0.964			
	B.11	0.999			

relationship between PF and QPofPHC, hence supports the findings of Doppelt (2017), Edmiston (2003) Kaisara and Pather, (2011), Muhammad et al. (2020) but contradicts the paper of Dikmen et al. (2005) possibly for the reasons that the study considers the relationship between end-user satisfaction and to quality of buildings. The indirect effects were the effects after the introduction of mediator FBP in the model. The model was tested through the mediator and all the two effects were significant. This satisfied the second causal step of Baron and Kenny (1986) and supports the papers of Gambo et al. (2016a) and Al-Yahya and Panuwatwanich, (2018). But it contradicts the results of Beneke et al. (2013) that focused on the level of conformance of work specifications. In the third step which is the total mediation effects after the introduction of the mediator variable, the path coefficient of total effect was not significant. This satisfied all the three causal steps of Baron and Kenny (1986). Therefore, mediation has taken place and FBP is a mediator between PF and QPofPHC. On the other hand, the measurement model indicated a consistent, reliable, and valid questionnaire.

The four (4) hypotheses developed for this study were all supported as well as in line with the causal steps for mediation as presented by Baron and Kenny (1986). The first hypothesis (H1) is directional and the results indicated a negative relationship between procurement planning factors and the quality performance of primary healthcare building facilities in Nigeria. This implies that poor procurement planning is affecting the quality performance of primary healthcare building facilities. The second hypothesis (H2) was also supported and the results indicated that there is a significant negative relationship between procurement planning factors and a construction firm's business partnership in Nigeria which also implies that poor procurement planning is affecting firm's business partnership construct. The third hypothesis was supported by the results and indicating that a significant positive relationship exists between firm business partnership factors and the quality performance of primary healthcare building facilities in Nigeria which also implies that a firm's business partnership is influencing the quality performance of primary healthcare building facilities construct. The fourth hypothesis (H4) was also supported by the results, which is indicating a non-significant relationship exists between procurement planning factors and quality performance of PHC building facilities after the introduction of firm's business partnership construct in the model. Hence, the construction firm's business partnership mediates the relationship between procurement planning factors and quality Performance of PHC building facilities in Nigeria.

Table 4. Results for the discriminant validity of the direct effect of PF on QPofPHC

	QHI	PF
QPofPHC	0.751	
PF	-0.206	0.780

Table 5. Hypotheses-testing results

Hypotheses	Path coefficient	R²	P value	Effect size	Stone-Geisser's Q²	Supported
PF → QPofPHC	-0.155	0.024	<0.01	0.0240	0.0250	Yes

Table 6. Results of the measurement model evaluation

Construct	Items	Factor Loading	CR	Cronbach's Alpha	AVE
QPofPHC	A.1	0.911	0.920	0.902	0.563
	A.2	0.855			
	A.3	0.893			
	A.4	0.999			
	A.5	0.998			
	A.6	0.887			
	A.7	0.897			
	A.8	0.897			
	A.9	0.917			
PF	B.1	0.939	0.944	0.935	0.609
	B.2	0.939			
	B.3	0.957			
	B.4	0.983			
	B.5	0.979			
	B.6	0.981			
	B.7	0.980			
	B.8	0.935			
	B.9	0.999			
	B.10	0.955			
	B.11	0.973			
FBP	C.1	0.900	0.963	0.956	0.765
	C.2	0.885			
	C.3	0.903			
	C.4	0.929			
	C.5	0.929			
	C.6	0.894			
	C.7	0.899			
	C.8	0.901			

15. Conclusion

The study aimed to assess the mediation effects of FBP on PF influencing QPofPHC for improving the quality performance of primary healthcare building facilities. The assessments of the effects are valuable for future improvement in the procurement of quality healthcare clinics and enhancing their quality performance in developing countries. This study served as an awareness and wake-up call for government in developing countries most especially in Nigeria. Also, the results of this study could be useful to other developing countries having similar problems. The study is highly helpful to small and medium construction firms through enlightenment on the benefits of

Table 7. Results for discriminant validity

	QHI	PF	FBP
QPofPHC	0.751		
PF	-0.206	0.780	
FBP	0.448	-0.175	0.874

Table 8. Hypotheses-testing results

Hypotheses	Path coefficient	R²	P value	Effect size	Stone-Geisser's Q²	Supported
PF → FBP	-0.20	0.04	<0.01	0.010	0.205 0.039	Yes
FBP → QPofPHC	0.44		<0.01	0.196		Yes
PF → FBP → QPofPHC	-0.07	0.21	0.11	0.038		Yes

a partnership. Construction firms in developing countries should adopt the culture of a firm's business partnership to increase productivity. This would enhance the quality performance of their products most especially PHC buildings as well as provides adequate healthcare services. On the stakeholders' perception, quality performance enhances harmonious long-term working relationships with clients. The findings highlighted that when a firm's business partnership is introduced into a construction contract business improves the relationship between procurement planning practice and quality performance of primary healthcare building facilities. The findings indicate that firm business partnership minimizes the effect of poor procurement planning on the quality performance of primary healthcare building facilities. The findings in this study serve as a breakthrough in the area of construction management research which establishes the process of improving the quality performance of building facilities for developing countries. The results would be generalized to other developing countries having an issue of poor-quality performance of construction projects. This study is limited to the improvement of the quality performance of PHC building facilities projects through the concept of mediation. Therefore, the study recommends research on the improvements of other aspects of performance such as cost, time, safety performances of projects using moderation effects.

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