



RESEARCH ARTICLE

Do quality improvement interventions for person-centered family planning work? Evidence from Kenya [version 1; peer review: 1 approved, 1 approved with reservations]

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Abstract

Background: Quality of care for family planning, especially person-centered care, is important from a health and human-rights standpoint. Few interventions have aimed to improve person-centered family planning (PCFP) in low and middle-income countries. In this study, we tested the impact of a quality improvement (QI) intervention in Kenya on aspects of PCFP included in a validated measure of PCFP and on the overall PCFP scale.

Methods: We conducted QI cycles in three facilities providing family planning in Nairobi and Kiambu Counties, Kenya, with three facilities serving as controls. Cross-sectional baseline data was collected from 478 women receiving family planning in 2016 and end line data was collected from 640 in 2017-18. We analysed the impact of the QI intervention on PCFP using difference-in-difference models.

Results: We found no impact of the QI intervention on either PCFP or the overall PCFP scale.



Conclusions: We take away key lessons learned from the null findings of the intervention that are important for future interventions. Lessons learned include the need to be flexible in light of external factors that prolonged the study and probably led to burnout; and simplifying measurement and procedures.

Keywords

Kenya, family planning, person-centered family planning, PCFP, quality improvement, Quality Improvement Collaborative, Breakthrough Series

Open Peer Review

Approval Status  

	1	2
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Any reports and responses or comments on the article can be found at the end of the article.

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Introduction

While there have been significant gains in contraceptive use in the past few decades, unmet need for family planning (FP) remains a significant challenge in Kenya, with 16.8% of women reporting an unmet need in 2017¹. Consequently, the Government of Kenya has been particularly interested in improving access to quality FP services, including a new urban program to integrate FP services into existing health services and working with health officials and community groups². Researchers have hypothesized that poor quality of FP services, including provider competence, interpersonal relationships, choice of methods, information given to clients, and appropriate constellation of services³, may be a barrier to broader contraceptive use, particularly among lower socioeconomic status women^{4,5}.

Person-centered and woman-centered models of FP have been proposed as important strategies to improve the quality of FP services³. These approaches for FP place the client at the center of care, working with broader health systems to ensure they receive dignified, respectful care, and that they are involved in all aspects of clinical decision-making^{6,7}. This approach has been shown to improve client satisfaction^{6,8} and method continuation⁶.

A recent review of the limited person-centered family planning (PCFP) interventions that do exist found that only two involved quality improvement (QI) approaches⁹. Overall, interventions that targeted various forms of person-centered care (PCC) were generally successful at improving client perceptions of the quality of care (usually measured with a satisfaction question). Results were mixed for outcomes such as FP knowledge, uptake and continuation. With regard to the two QI interventions identified, the first focused solely on FP in Kenya and provided training for facilities on aspects of PCC as well as the facility environment¹⁰. This intervention found impacts at the supervisory and provider levels and in observations of client-provider interactions; however, it did not find an impact on client reports of person-centered outcomes such as satisfaction, privacy, being treated well, confidentiality, and cleanliness of the facility. The second, in Malawi, focused on many aspects of maternal and reproductive health, including FP, and mostly measured more clinically related outcomes. Generally, the QI intervention did not impact outcomes for FP, however, respondents in the intervention group were more likely post intervention to say that the provider “established a cordial relationship and identified her needs”¹¹.

QI methodologies have been implemented across various global healthcare settings to improve both processes and health outcomes. In 1995, the Institute for Health Improvement developed a QI framework called the “Breakthrough Series” (BTS) to support healthcare systems in making improvements while simultaneously reducing costs¹². A key aim of the BTS is collaborative learning, which is facilitated by bringing together multi-disciplinary QI teams to work on common challenges typically over 9–12 months. Within a BTS or Improvement Collaborative, QI teams agree on collaborative

and facility aims for improvement, share their performance using common measures and then work individually during quarterly “action periods” to secure improvements. After each action period, participants in the Collaborative meet together to discuss progress from the previous period, set aims for the upcoming action period and identify potential changes they could make to improve outcomes. Improvement Collaboratives use Plan-Study-Do-Act (PDSA) cycles to test and adapt change strategies aimed at improving the selected outcome¹³. The BTS has been used to successfully secure improvements in maternal and child health in low-and middle-income countries (LMIC) settings and has been demonstrated to be cost-effective in resource-constrained environments^{14,15}. We conducted an intervention using QI cycles to improve PCFP in three facilities in Nairobi and Kiambu Counties, Kenya, and explored the impact on PCFP related outcomes, compared to three comparison facilities. To our knowledge, this is the first application of the BTS to secure PCFP improvements in LMICs.

Methods

Step 1: Baseline data collection

First, six public health facilities providing family planning and delivery care were selected in Nairobi and Kiambu Counties, Kenya. Baseline data was collected from 478 women who had recently taken up a FP method from all facilities between August and September 2016. Data was collected to understand baseline PCC performance for FP clients so that we could inform the intervention and compare to endline data. Female research assistants surveyed women in a private location within the facility grounds for both baseline and endline for all six facilities, after the women completed a written informed consent. Interviews were conducted in the respondent’s preferred language (English or Kiswahili or a mix of both) and took roughly 45 mins-1 hour. The survey (*Extended data*¹⁶) was read to respondents and data were entered into a tablet. Data was collected on women’s experiences of receiving their family planning method, method choice and uptake, as well as socio-demographics. The main outcome of interest is a validated scale for PCFP constructed by Sudhinaret and colleagues⁷. The validated PCFP scale for Kenya included 20 items, which fell into 2 sub-domains, “autonomy, respectful care, and communication” and “health facility environment.” The paper describing the validation process also describes the data collection approach in more detail⁷.

Step 2: QI Intervention development and implementation

Three of these facilities were selected to participate in a QI intervention to improve PCC for FP clients and childbirth patients, while the remaining three were assigned to a control arm. An Improvement Collaborative was then designed utilizing the BTS model¹² and QI teams were formed at each intervention facility. Initially, health facility managers were requested to nominate members from a range of staff disciplines suggested by the external QI expert (e.g. doctors, midwives, data clerks, support staff). Over time, QI team members recruited additional colleagues to cover gaps when pivotal staff were moved or greater representation was needed.

Over the course of the 9-month Collaborative, the QI teams worked together to improve four specific PCC topics in FP. The QI intervention was implemented over an extended time period due to delays related to two national strikes of healthcare providers that occurred during the study period. The intervention began in June of 2017 and completed in October of 2018. Intervention facilities developed change ideas to improve performance on the following person-centered family planning care topics: 1) Health care providers introduce themselves to the client; 2) Healthcare providers call the client by her name; 3) Doctors and nurses asked the client how she was feeling; and 4) The client felt she could ask any questions that she had. Topics were chosen based on data from the baseline survey about gaps. Intervention facilities focused on developing change ideas for a specific set of topics for three months, and focused on new topics in the subsequent quarter.

Step 3: End line data collection

An endline evaluation (*Extended data*¹⁶) of 640 women was conducted across all six study sites between October 2018 and April 2019 to assess intervention impact. The same recruitment and data collection approach was used as at baseline (described above).

Data analysis

We ran a series of difference-in-differences models on various outcomes related to PCC. Per standard practice, the difference-in-differences estimators included a variable for time (baseline/endline), a variable for intervention (intervention/control) and a multiplier of these two (time*intervention). The primary outcomes explored included looking at PCFP overall and the specific topics focused on in the QI intervention⁷. A

higher score on the PCFP scale indicated a more positive experience at the time of receiving family planning counselling and a method.

We first compared the population in the control and intervention facilities using t-tests to see if any significant demographic differences emerged. We then explored the change in the mean PCFP score and sub-scales between baseline and endline, and between control and intervention facilities, using t-tests. Finally, we conducted a series of difference-in-differences models that looked at the impact of the intervention on the following: the full PCFP score, two subscales (“autonomy, respectful care and communication” and “health facility environment”) and the four specific topic areas that facilities focused on in the Improvement Collaborative. Not all facilities worked on all four “improvement” topics, therefore analysis of performance differences between baseline and endline for these four topics excluded non-participatory facilities. All data analysis was conducted in Stata version 15¹⁷.

Ethical approval

This study (intervention and data collection) was approved by the Institutional Review Board at The University of California, San Francisco [# 15-18008] and the Kenya Medical Research Institute’s Scientific and Ethics Review Unit [# Non-KEMRI 526]. All subjects have provided written consent to participate in study activities under these approvals.

Results

[Table 1](#) shows the demographics of respondents, broken down by those in intervention and control facilities. All in all there were 227 women in the control and 292 women in the

Table 1. Comparison of demographics by control and intervention facilities.

	Control		Intervention		Total	
	No.	%	No.	%	No.	%
	521	44.95	638	55.05	1159	100
Age category						
Under 20	19	3.6	10	1.6	29	2.5
20–24	182	34.9	203	31.8	385	33.2
25–29	163	31.3	230	36.1	393	33.9
30 and over	157	30.1	195	30.6	352	30.4
Pearson chi2(3) = 9.0756 Pr = 0.028						
Marital status						
Single, cohabiting, partnered, divorced, widowed	76	14.6	86	14.4	162	14.5
Married	445	85.4	511	85.6	956	85.5
Pearson chi2(3) = 6.9537 Pr = 0.073						
Number of births						
1	217	42.2	246	42.1	463	42.2
2	167	32.5	192	32.9	359	32.7

	Control		Intervention		Total	
	No.	%	No.	%	No.	%
3	90	17.5	104	17.8	194	17.7
4+	40	7.8	42	7.2	82	7.5
Pearson chi2(3) = 0.1544 Pr = 0.985						
Working						
No	246	47.2	273	45.7	519	46.4
Yes	275	52.8	324	54.3	599	53.6
Pearson chi2(1) = 0.2477 Pr = 0.619						
Education						
No school/Primary	177	34	219	36.7	396	35.4
Post-primary/vocational/Secondary	215	41.3	235	39.4	450	40.3
College or above	129	24.8	143	24	272	24.3
Pearson chi2(2) = 0.9018 Pr = 0.637						
Religion						
Non- majority	226	43.4	246	41.2	472	42.2
Majority Religion	295	56.6	351	58.8	646	57.8
Pearson chi2(1) = 0.5381 Pr = 0.463						
Tribe						
Other tribe	360	69.1	263	44.1	623	55.7
Kikuyu	161	30.9	334	55.9	495	44.3
Pearson chi2(1) = 70.7258 Pr = 0.000						
Type of family planning adopted						
Short term (condom, pill)	106	20.5	144	24.1	250	22.4
Long term (IUD, implant, injectable)	411	79.5	453	75.9	864	77.6
Pearson chi2(1) = 2.0833 Pr = 0.149						
Satisfied with care						
Satisfied, dissatisfied, very dissatisfied	357	68.5	390	65.3	747	66.8
Very satisfied	164	31.5	207	34.7	371	33.2
Pearson chi2(1) = 1.2812 Pr = 0.258						
Provider preference for which method adopted						
None, slight, moderate preference	420	80.6	475	79.6	895	80.1
Strong, very strong preference	101	19.4	122	20.4	223	19.9
Pearson chi2(1) = 0.1920 Pr = 0.661						

intervention facilities at baseline, and 294 women in the control and 349 women in the intervention facilities at end line (no significance difference in sample size). Intervention and control facilities were significantly different in terms of age, with control facilities having more younger women. There were no significant differences between intervention and control participants in terms of marital status, work, parity, or education. Women in the intervention facilities were more likely to be

of the dominant tribe (Kikuyu) than in control facilities. Most women (77.6%) adopted a long-term FP method, with no differences between intervention and controls. About a third (33.2%) of all women said they were very satisfied with their care, and most said that the provider had no preference, a slight preference, or a moderate preference about what method they adopted, again with no difference between control and intervention facilities (80.1%).

There was a significant improvement in PCFP scores in control facilities between baseline and endline, increasing from a mean of 41.70 to 43.20 (p=0.0245) (Table 2). There was no change in PCFP scores in intervention facilities over time.

Difference-in-difference models showed that there was no impact of the intervention on the total PCFP scores or the two sub-scales of the PCFP scale (Table 3). When looking at the specific item-foci of the QI intervention (for example, facilities that specifically worked on the PCFP topic “provider asking if the woman had any questions” did not see a change in reports of that item), we found that there was a significant negative impact of the intervention on the “providers calling respondents by their name” item for the combined effects of the intervention and time, even though this indicator significantly improved both over time and in intervention compared to control facilities. The sub-domain for Health Facility Environment and the item for “provider introducing themselves” significantly increased between the two survey rounds as well.

Discussion

This evaluation found no impact of the intervention on women’s reports of the PCFP that they experienced. This

held true for the full scale, sub-scales, and also individual items that each facility focused on in their QI work. Given the substantial body of evidence pointing toward Improvement Collaboratives as an effective intervention in low- and middle-income healthcare settings, the most likely interpretation of these results is that observed challenges hindered the QI intervention. Feedback we received from study facilities corroborates this interpretation.

First, the QI process itself may have been too cumbersome to be effective. QI teams set out to improve more topics for this project than is typical in an Improvement Collaborative. Alongside the four topics for FP, another 13 were selected for maternity care. This was necessary to try and detect an impact in the overall evaluations (the PCFP and person-centered maternity care scales). However, it dramatically increased the amount of time required to organize and analyse data in weekly QI review meetings. In addition, QI teams faced an extra burden of gathering their own performance data. QI work characteristically utilizes data that is already recorded in registers or collated for performance management purposes. Person-centered care performance is rarely monitored routinely in healthcare facilities, thus QI teams were asked to conduct their own exit interviews to assess on-going progress. This required a disproportionate amount of team effort to maintain suggested sample sizes to understand changes in QI team performance.

Delays due to two national strikes by doctors and nurses extended the overall project timeline from 9 to 21 months. This exacerbated the impact of staff turnover on QI team cohesion and continuity. The overall duration may have contributed to a decline in attendance at QI team meetings in the final

Table 2. Mean person-centered care scores over time by intervention and control facilities.

	Baseline	Endline	T-test p-value
Control Facilities	41.70	43.20	0.0245
Intervention	42.95	42.97	0.9772

Table 3. Difference-in-difference (DID) models of the impact of the person centered care (PCC) intervention on PCC measures.

	Survey round	Intervention	DID
Full PCC scale	0.953 (-0.381 - 2.288)	2.551* (-0.477 - 5.579)	-1.385 (-3.214 - 0.444)
Autonomy, respectful care, communication	0.393 (-0.719 - 1.506)	1.799 (-0.723 - 4.322)	-0.924 (-2.448 - 0.600)
Health facility and environment	0.456** (0.0960 - 0.816)	0.503 (-0.321 - 1.328)	-0.301 (-0.797 - 0.195)
Provider introduced themselves (all facilities)	0.149** (0.0248 - 0.274)	-0.0174 (-0.298 - 0.263)	0.150* (-0.0202 - 0.320)
Provider called the respondent by name (all facilities)	0.567*** (0.386 - 0.748)	0.448** (0.0275 - 0.868)	-0.292** (-0.543 - -0.0406)
Provider asked respondent how she was feeling (2 facilities)	0.0772 (-0.156 - 0.311)	-0.0670 (-0.672 - 0.538)	0.0638 (-0.296 - 0.424)
Provider asked respondent if she had questions (1 facility)	0.0315 (-0.181 - 0.244)	0.398 (-0.301 - 1.097)	-0.211 (-0.623 - 0.202)

*All data presented controlling for age, marital status, education, working status, tribe, number of children and family planning method adopted

*** p<0.01, ** p<0.05, * p<0.1

three-months of the program and a sense of “improvement fatigue” reported by the expert QI facilitators.

Second, system constraints within the healthcare facilities may also have hindered the QI intervention. External evaluators noted stock-outs of FP methods reported by intervention and control facilities alike during the endline data collection period. This experience is likely to have influenced overall levels of satisfaction with the FP services, as some clients may have been asked to choose an alternative FP method or return when new supplies were available. This failure is likely to have influenced overall perceptions of PCFP in both intervention and control facilities equally, however combined with challenges noted above could have had additional impact in intervention facilities.

Disentangling potential contributors can help future interventions aimed to improve quality of FP services have better success, especially for person-centered measures or that use QI approaches. Future work to improve PCC in FP should ensure a streamlined QI process with a low burden on data collection and number of topics to improve.

Limitations

This study had a robust design with both control and intervention facilities being measured both pre and post-intervention. Despite this, there were also limitations. All respondents had selected a FP method; therefore, we were not able to measure the impact of the QI intervention on FP uptake. Additionally, our focus was only in Nairobi and Kiambu counties, which are urban and peri-urban, and thus these findings are not generalizable to other parts of Kenya or other settings.

Ethics approval and consent to participate

This study was approved by the Institutional Review Board at The University of California, San Francisco [# 15-18008] and the Kenya Medical Research Institute’s Scientific and Ethics Review Unit {# Non-KEMRI 526}. All subjects have provided written consent to participate in study activities under these approvals.

Data availability

Underlying data

Dryad: Evaluation of person centered quality improvement intervention for family planning in Kenya, <https://doi.org/10.7272/Q6SX6BD9>¹⁶.

This project contains the following underlying data:

- Baseline data
- Endline data

Extended data

Dryad: Evaluation of person centered quality improvement intervention for family planning in Kenya, <https://doi.org/10.7272/Q6SX6BD9>¹⁶.

This project contains the following extended data:

- Baseline survey
- Endline survey

Data are available under the terms of the [Creative Commons Zero “No rights reserved” data waiver](#) (CC0 1.0 Public domain dedication).

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Summary and overall recommendation:

This is a very interesting and relevant article investigating the impact of a quality improvement strategy, known as the Breakthrough Series (BTS), on the quality of family planning service delivery in central Kenya. Although the authors found null results, the findings still offer important lessons in terms of intervention fidelity and feasibility in the Kenyan context. There are some key pieces of information missing and I urge the authors to fill these gaps to help their readership better understand and utilize these results in future quality improvement efforts. I provide additional details on these recommended changes below. I appreciate having the opportunity to review this manuscript and applaud the authors for their contribution to improving the quality of FP service delivery in LMICs.

Specific recommendations:

Title: I recommend changing the title to specify that the study took place in Nairobi/central Kenya. As written, readers may interpret the results as applicable to the country, as a whole.

Abstract: I would mention BTS specifically in the abstract.

Introduction:

1. Recommend different source/evidence of Kenya's commitment to FP quality of care: The authors write: "*Consequently, the Government of Kenya has been particularly interested in improving access to quality FP services, including a new urban program to integrate FP services into existing health services and working with health officials and community groups*2." The authors are referring to the Urban Reproductive Health Initiative in Kenya (known as

Tupange, a Swahili word for 'let's plan'), implemented from 2009-2014. I would be hesitant to call this program 'new.' Additionally, it wasn't clear to me from the cited article that the national government has actually taken ownership and converted the Tupange project into a national program. Perhaps I skimmed the citation too quickly, but I think there is other/better evidence of the Kenyan government's commitment to high-quality family planning such as their participation in FP2020, etc.

2. Complete Bruce framework: In citing the Bruce framework, don't forget 'follow-up mechanisms' (and consider putting the elements of the framework in the same order as the Bruce article so that it's easier to see they are all there). Additionally, I might recommend calling 'interpersonal relationships' something more explicit (as written, it's not clear that the relationship is between the provider and client.) Perhaps "provider-client relations" or "interpersonal relations between providers and clients."

Methods:

1. More information on facility and participant selection: Can the authors say more about how the six facilities were selected (randomly? Or was it convenience?) and the level of the facilities included (i.e. dispensary, health center, or hospital?). How was it determined which facilities would be intervention and which would be control? How many intervention facilities were in Nairobi versus Kaimbu? Can there also be more information about how FP clients were selected (all clients exiting on the day of the surveys? How many refused to participate?) and how they decided on the total number to interview at each site?
2. More information on the range of the validated PCFP scale: Can the authors please describe the possible range of scores for the PCFP scale and the two sub-scales? Without this information, results are a little more difficult to interpret. What constitutes a meaningful change in scores?
3. More information on the QI teams: How many providers participated in the original QI teams in each of the three intervention facilities? How many providers were replaced over time because they moved to a different facility? In other words, approximately how many people were members of the QI teams at each of the intervention facilities and how many people stayed on the team for the duration of the intervention, versus were replaced if they moved to a different facility?
4. More description of how action areas were selected: Can you better describe how action areas were identified and prioritized? How did providers determine which items were likely to be most important to clients and therefore likely to impact their perception and use of services?
5. Health care versus Healthcare – be consistent in spelling. Clarify that it's a repeated cross-section and not a longitudinal study following the same women at endline and baseline.

Results:

1. Table 1, Title: A more descriptive title is needed. These are the demographics of FP clients, correct? And gathered at baseline, right?
2. Table 1, include facilities: Can you include facility characteristics (facility type, number of

providers at each, etc)? How did these characteristics differ between the control and intervention facilities?

3. Table 1, Curious about categorization of covariates: Why is injectable categorized as a long-acting method? Why is 'satisfied' grouped with 'dissatisfied'?
4. Table 2, expanded: Can you expand the content of this table to include baseline/endline, treatment/control comparisons of the two PCFP sub-scales, in addition to the full scale PCFP scores?
5. Table 3, headings: Does survey round mean baseline versus endline and can this be clarified? Does intervention mean treatment versus control? Would be helpful to specify.

Discussion:

1. Discuss differences between treatment and control groups: How might differences in age and tribe between control and treatment groups have impacted the results?
2. Providers and facility support staff conducted the exit interviews? I stopped short on reading that the QI teams gathered much of the data themselves (including conducting exit interviews?); did I understand that correctly? Was this also true in the control sites? Were the providers all trained to do this? This seems highly burdensome to the providers and would likely impact their overall motivation and effort. Could this have impacted results? Apologies if I misunderstood. This seems a big deviation from the standard intervention protocol and would understandably reduce provider effort.
3. Unpack discussion around impact of stock-outs: Build out the discussion more in terms of how stock-outs and other infrastructure/readiness deficits will significantly handicap and discourage providers attempting to offer a high standard of care. And, given the high prevalence of commodity stockouts, what does this suggest about the potential for success of future QI efforts? What infrastructure efforts might need to happen first?
4. Unpack discussion around provider turn-over and the feasibility of this type of intervention in Kenyan context: Build out the discussion much more about whether this type of intervention is really feasible in public facilities in Kenya where workers are frequently out due to strikes or transferred to other facilities. Is this the best approach in an environment with high provider turn-over?
5. Unpack discussion of null results: I encourage the authors to say more about how we should interpret the likelihood that the observed challenges impeded intervention fidelity as stockouts, strikes, and shifting workers are a consistent reality of the public healthcare system in Kenya. It is really striking that there was no impact on the four indicators – didn't the providers at the intervention facilities identify and select these change areas themselves? Should this have led to buy-in and cooperation by the providers? And weren't these relatively low effort changes to implement? In other words – I would have predicted that the treatment facilities would have seen a big jump in the four measures given they picked these measures themselves and they seem really easy to do. It's perplexing that 2 out of 3 intervention facilities didn't try to implement some of these change areas that they were involved in selecting. It would be helpful to better understand why this was the case as

I imagine the participatory approach of BTS is a big part of why it typically works in other settings. Did you have feedback from the facility staff to help explain this? Why couldn't providers in two of the three facilities ask clients if they had any questions? This seems like such a simple thing to implement for a short period time, especially when you know you will be assessed on it. I'm wondering if the facilities might have preferred to identify their own facility-specific indicators. Finally, could having only 1 or 2 facilities implementing some of the change areas have impacted the results?

6. Place findings in the context of existing literature: Can you add a small discussion in which you place your results in the context of the two PCFP QI studies described in the introduction?
7. Could the intervention be adjusted to be more feasible? At a minimum, could the intervention be modified in future iterations to remove the burden of gathering performance data by the providers themselves – it's easy to see how this would negatively impact providers with a high case load and a large amount of administrative tasks already – which is the case for most large public-sector facilities in Kenya.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: reproductive epidemiologist; social scientist in global population health

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 18 May 2020

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Timothy Abuya 

Population Council, Nairobi, Kenya

General Comments

The paper is generally well written and presented. However, there are a few details that would have made the paper better. I highlight a few of these areas below

1. Provide a few more details of implementation

- The paper would benefit if a summary of implementation process would be provide. This would have helped the reader appreciate the challenges they bring in the discussion. For example, what are the areas the QI teams agreed to improve, how did this change over time, how did these areas relate to the measurement areas - ie to what extent did this fit the sub domains of the PCFP constructs

2. Study design

It would have better if some details are provided on how the assignment of facilities were done. This is a bit unclear. Two a few description of the facility characteristics to illustrate how similar they were ie. what level of facility are they? How did the facility environment score generated? This might give a clear understanding of context and provide a few details left out in study design

3. Link between design and measurement elements

- It might be worth providing clarity on the measure constructs and the change ideas areas that facilities developed. A sort of map that links the constructs and the measurement areas might help appreciate the result better since it could be the change ideas did not necessary reflect all the elements of measurement. This together with the data on implementation process should be considered as supplementary information

4. Clarity on other minor issues

Table 1 - Did the authors use - Satisfied, dissatisfied, very dissatisfied as one combined group? this was not clear to me.

Similarly use of a combined marital status - Single, cohabiting, partnered, divorced, widowed - was unclear as well. Was this due to small numbers? What was the logic?

5 Discussion

The authors have attempted to provide reasons behind the lack of effect which to me makes sense. However, some details around intervention elements come in too late. An earlier description would help the reader follow it well.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Public health polices/evaluation, health system

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.
