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Supportive supervision: An effective intervention in achieving high quality malaria case management at primary health care level in Jos, Nigeria

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Abstract

Background: Supportive supervision is a form of supervision that promotes quality at all levels of health system by strengthening relationships within the system through prompt identification and resolution of problems among others. It is an effective intervention in improving health worker performance in low resource settings. Malaria is responsible for majority of outpatient consultations in Nigeria at all levels of care.

Materials and Methods: This was a facility-based interventional study with pre and post-intervention phases conducted among two groups.The study subjects were selected through a multistage sampling technique and data collection was done using both semistructured interviewer administered questionnaire and supervisory checklist.

Results: The mean knowledge scores of malaria within the intervention group showed an increase from 10.3 ± 1.4 at preintervention to 11.3 ± 1.5 at post-intervention ($P < 0.0015$). The proportion of respondents who correctly followed malaria management guidelines increased from 32.73% at first supervisory visit to 70.91% by the third supervisory visit ($P < 0.001$). An analysis of the supervisory checklist showed improvement in performance of healthcare workers with each supportive supervisory visit in most of the variables examined.

Conclusions: This study has demonstrated that supportive supervision is a feasible and practicable tool in improving knowledge and practice of malaria case management among PHC workers.

Keywords: Case management of malaria, primary health care, supportive supervision

Résumé

Fond: Soutien supervision est une forme d'encadrement qui favorise la qualité à tous les niveaux du système de santé en renforçant les relations au sein du système grâce à l'identification rapide et la résolution de problèmes, entre autres. C'est une intervention efficace dans l'amélioration des performances de travailleur de santé à faibles ressources. Le paludisme est responsable de la majorité des consultations externes au Nigeria à tous les niveaux de soins.

Matériel et méthodes: Il s'agit une étude interventionnelle en établissement avec pré et phases après l'intervention menées auprès des deux groupes. Les sujets de l'étude ont été sélectionnés grâce à une technique de plusieurs degrés d'échantillonnage et de collecte de données a été faite en utilisant questionnaire semi-structurées intervieweur administré et liste de contrôle de surveillance.

Résultats: Les scores de connaissance moyenne du paludisme au sein du groupe d'intervention ont montré une augmentation de 10,3±1.4 en échelonnant à 11,3±1,5 à après l'intervention ($P < 0,0015$). La proportion de répondants qui ont suivi correctement les lignes directices de paludisme est passé de 32,73 % au première visite de surveillance 70,91 % par la visite de surveillance troisième ($P < 0,001$). Une analyse de la liste de contrôle de surveillance a montré une amélioration dans la performance des travailleurs de la santé à chaque visite de surveillance favorable dans la plupart des variables examinées.

Conclusions: Cette étude a démontré que la supervision de soutien est un outil possible et réalisable dans l'amélioration des connaissances et des pratiques de gestion de cas de paludisme chez les travailleurs des soins de santé primaires.

Mots clés: Gestion des cas de paludisme, PHC, supervision de soutien

Introduction

The challenges to human resources for health have been at the fore front of debates to improve healthcare delivery and primary health care (PHC) implementation. Emphasis has been placed on health worker motivation and performance as areas requiring immediate attention in low resource settings.[1,2]

Human resources for health at the PHC level include the public health nurses, midwives, community health officers (CHO), community health extension workers (CHEW), health assistants, and village health workers. The performance of these groups of workers at the PHC level has faced numerous challenges as well as criticisms ranging from poor communication with rest of the healthcare system, poor training, understaffing, lack of basic supplies, poor health worker performance, and poor practices.[2,3]

Various interventions have been proposed to tackle health worker poor performance. Prominent among them is the strengthening of supervision which has been recognized as a generally effective intervention in improving health worker performance in low resource settings.[2] Supervision has been reported as one of the nonmonetary motivators of health workers and its absence can be correlated with health worker poor job satisfaction as well as poor service delivery.[4] Supervision has been defined as the watching over an activity or task being carried out by somebody and ensuring that it is performed correctly.[5]

Traditionally supervision has been top-down, carried out to inspect and oversee health facilities often focusing on administrative functions, and the communication of directives.[6,7] This approach to supervision paid more attention to fault finding and control and less on developing staff performance or motivation. The failure of this traditional model of supervision has led to the emergence of a new paradigm of supportive supervision.

Supportive supervision has been defined as a form of supervision "that promotes quality at all levels of the health system by strengthening relationships within the system, focusing on the identification and resolution of problems, and helping to optimize the allocation of resources".[6] This approach to supervision has been further described as expanding the scope of supervision and emphasizing mentoring, joint problem-solving, and two-way communication between the supervisor and those being supervised.

In this study, supportive supervision in the context of malaria case management was studied. Malaria is responsible for majority of outpatient consultations in Nigeria.[8,9] PHC workers will see more cases of malaria than any other childhood disease; hence malaria case management provides an appropriate clinical condition to measure the effect of supportive supervision of PHC workers.

Materials and Methods

Plateau State, one of the 36 states in Nigeria, is made up of 17 local government areas (LGAs). Each LGA is made up of several wards. Each ward has at least one government owned PHC in addition to several privately owned PHC facilities. A PHC caters for about 10,000-30,000 persons in the population.

Jos North LGA has a total of 24 government owned PHC health facilities and 21 privately owned health facilities.[10] Jos North LGA has 14 wards each hosting between one to four health facilities. Jos North LGA has an estimated population of 437,217.[11] Jos South LGA has 16 wards each hosting one to two health facilities. It has 35 government owned PHC facilities.[10] It has an estimated total population of 311,392.[11]

The study involved all PHC workers responsible for treatment of malaria in the selected PHC centers in Jos North and South LGAs. Intervention group comprised of selected PHC workers in Jos North LGA. Control group comprised of selected PHC workers in Jos South LGA.

This was a facility-based interventional study. For both intervention and control groups, a baseline survey on malaria knowledge, diagnosis, and treatment of under-fives was carried out. Selected local government supervisors trained on supportive supervision methods carried out supportive supervision of the intervention group, while the control group experienced traditional supervision over a period of 12 weeks. Post-intervention survey of both groups was done to see the effect, if any of supportive supervision.

The minimum sample size for this study was 110, using an increase in performance following

supervision of 42% (0.42),[3] an expected increase in performance of 70% (0.70), and an alpha level of 0.05. The study subjects were selected through a multistage sampling technique as outlined below;

Stage one: Selection of study sites

Using simple random sampling technique, Jos North LGA was selected by balloting from a list of all 17 LGAs in Plateau State, as the intervention area. Jos South LGA was selected as control site also by balloting. Also using simple random sampling technique, Jos North LGA was selected by balloting as the intervention area. Jos South LGA was selected as control site.

Stage two: Selection of wards

Jos North LGA has 15 political wards that have publicly owned PHC facilities. Five wards were selected using simple random sampling by balloting and these were Tafawa Balewa, Jenta Apata, Jenta Adamu, Lamingo, and Tudun Wada political wards. Similarly, Jos South LGA has 16 political wards that have publicly owned PHC facilities. Five wards were also selected using simple random sampling by balloting. These were Du B, Giring, Hwolshe, Bukuru, and Gyel A wards. Chugwi, Vwang, and Turu A were also selected by balloting when the selected wards did not provide the minimum sample size of 55 PHC workers.

Stage three: Selection of PHCs

In Jos North LGA, one PHC center was then selected for each political ward also by balloting and these were PHC's Township, Jenta Apata, Jenta Adamu, Lamingo, and Tudun Wada, respectively.

In Jos South LGA, one PHC center was also selected for each political ward by balloting. These were PHC's Rayfield, Hwolshe, Bukuru central, Bukuru express, State Lowcost, Chugwi, Vwang, and Vom Vet, respectively.

Stage four: Selection of healthcare workers

All PHC workers who were involved in malaria case management of under-five's in the selected PHC centers in Jos North and South LGA were selected.

Data was collected using a semistructured interviewer administered questionnaire and was administered to all eligible participants in both the intervention and control groups.

Intervention

Selected local government supervisors responsible for supervising the PHC centers in the respective wards of the LGA were recruited. They were trained on supportive supervision of malaria case management using an adaptation of the World Health Organization (WHO) guidelines on supportive supervision.[12] A supervisory checklist was adapted for malaria treatment from the supervisory checklist for the monitoring/supervision of Integrated Management of Childhood Illnesses (IMCI) activities.[13] Supervisors were taught how to use this checklist in the context of supportive supervision. This supervisory checklist was given to them to use in their supervisory sessions with study participants. A monthly schedule lasting 2 hours each was adopted for the supervisory sessions with at least 15 min spent with each health worker. This was carried out for a period of 3 months. Copies of treatment manuals for malaria were provided for supervisors to aid the supervisory processes. They were given monthly incentives (stipends and transport fare) to aid the supervisory visits. Three months after the intervention, a post-intervention survey was carried out on both intervention and control groups. The same study instruments used at baseline were administered to the healthcare workers after the intervention period in both intervention and control groups.

Data processing and analysis was done using Epi Info version 3.4.2 and STATA 9 statistical software's. Mean and standard deviation were done for quantitative variables which include knowledge and management scores. Student's *t*-test was used to compare these scores in intervention and control groups. Percentages were used to represent qualitative variables which include sex, work experience, professional cadre, mode of diagnosis, referral practices, and performance at supervisory visits. Chi-square (χ^2) test was used to evaluate differences in these qualitative variables in intervention and control groups. A confidence interval (CI) of 95% was used and level of statistical significance was set at $P \leq 0.05$.

Written ethical clearance was sought and gotten for the study. Written permission was gotten from the Jos North and Jos South Local Government Council as well as the PHC directors of the LGAs.

Written informed consent was also gotten from participating workers after a brief description of the study. Participants were assured of the confidentiality of responses and information provided.

The following limitations were encountered in the course of carrying out this study;

1. The practice of having one or two healthcare workers perpetually carrying out outpatient consultations, one dispensing and others carrying out several other semi-defined functions, other than consulting, during normal working hours in the healthcare facility made assessment of healthcare workers rather difficult. This was partly remedied by the call

hours where each healthcare worker will carry out consultations. Malaria case management practices could not be linked to healthcare workers currently seeing patients.

2. There was irregular supply of artemisinin-combination therapies (ACT's) at PHC centers and this could have affected prescribing patterns of healthcare workers. Supportive supervision did little to improve this situation.

Scoring systems and operational definitions

In this study, the following scoring systems were modified and adopted.[14,15]

In calculating knowledge scores, a point was awarded for each correct response and no point for wrong responses and nonresponses in the knowledge section of questionnaire. These were totaled and reported for each healthcare worker. Maximum attainable score was 14.

In calculating management scores, key components of malaria case management such as brief history, diagnosis, treatment modalities, and referral practices were scored. In brief history, for example, taking a history of fever and any other two symptoms of malaria was considered good practice. Each correct response was awarded a point. Scores were totaled and reported for each healthcare worker. Maximum attainable score was 12. Mean scores were computed and reported for both intervention and control groups.

In analyzing the supervisory checklist, minor error was defined as a healthcare worker who meets at least 50% of criteria for patient management as outlined in the standard malaria case management guidelines for peripheral healthcare workers of the Federal Ministry of Health (FMOH).[16] These were considered adequate management with minor errors in treatment. Those meeting less than 50% of the criteria were considered inadequate management with major errors in treatment. Correctly following the guidelines was defined as conforming to the guidelines with no major or minor errors in management.

Results

At preintervention, a sample of 55 health workers was studied in the intervention group and 50 health workers in the control group. At post-intervention, 51 health workers were reviewed in the study group and 49 in the control group with an attrition rate of 7.3 and 2%, respectively.

Table 1: Sociodemographic characteristics of primary healthcare workers recruited into the intervention and control groups

Variable	Intervention group (*n*=55)		Control group (*n*=50)		χ^2	*P* value
	Frequency	(%)	Frequency	(%)		
Age						
21-30	9	16.36	2	04		
31-40	21	38.18	17	34		
41-50	19	34.55	28	56		
>50	6	10.91	3	06	7.377	0.06
Sex						
Female	44	80.00	45	90		
Male	11	20.00	5	10	2.027	0.15
Cadre						
CHO	2	3.64	4	08		
CHS	1	1.82	0	00		
JCHEW	16	29.09	9	18		
SCHEW	23	41.82	16	32		
Nurse/midwife	13	23.64	21	42		0.14*
Work experience (years)						
1-5	11	20.00	4	8		
6-10	9	16.36	1	2		
11-15	12	21.82	15	30		
16-20	12	21.82	21	42		
>20	11	20.00	9	18	12.44	0.01
Prior malaria training						
Yes	12	21.82	19	38.00		
No	43	78.18	31	62.00	3.29	0.07
Supervision†						
Yes	35	63.64	42	84.00		
No	20	36.36	8	16.00	5.55	0.02

*Fisher's exact test, †Traditional supervision. CHO=Community health supervisors, JCHEW=Junior community health extension workers, SCHEW=Senior community health extension workers, CHS= Community health supervisor

Sociodemographic characteristics

In the intervention group, mean age of respondents was 40 ± 8.1 years, while mean age in the control group was 42 ± 6.3 years. The mean years of experience in the intervention group was 14.2 ± 7.8 years, while in the control group it was 16.8 ± 6.7 [Table 1].

Knowledge, diagnosis, and treatment of malaria in under-fives

At preintervention, mean knowledge scores of malaria in the intervention group was 10.3 ± 1.4, while in the control group it was 10.6 ± 1.7 ($t = 0.98, P = 0.33$). At post-intervention mean knowledge scores improved to 11.3 ± 1.5 in the intervention group, while it decreased in the control group to 10.5 ± 2.3, and this was statistically significant ($t = 2.08$, $P = 0.04$). The mean knowledge of malaria within the intervention group showed an increase from 10.3 ± 1.4 at preintervention to 11.3 ± 1.5 at post-intervention and this increase was statistically significant. ($t = 3.57$, $P < 0.0015$) No similar increase was observed in the control group.

Concerning under-five malaria management practices, at preintervention the mean management score of intervention group was 5.8 ± 1.7, while that in the control group was 6.2 ± 1.7 ($t = 1.22$; $P = 0.23$). Following the intervention, the mean management score improved marginally in the intervention group to 7.1 ± 6.4. Compared with a mean management score of 5.7 ± 1.6 in the control group at post-intervention, this increase was not statistically significant ($t = -1.50$; $P = 0.14$).

In the PHC workers management practices, the diagnosis of malaria in under-fives was closely examined. At pre-intervention, 69.1% of intervention respondents mentioned taking a history of fever, while 29.1% will wait for a laboratory result before making a diagnosis of malaria. In the control group 74% of respondents will take a history of fever. At post-intervention these figures decreased with 41.2% of respondents in the intervention group taking a history of fever and 58.8% waiting for a laboratory result, while 49.9% of respondents in the control group will take a history of fever and 55.1% will wait for a laboratory test before making a diagnosis of malaria. This change was however not statistically significant [Table 2].

At preintervention, 72.7% of intervention respondents used chloroquine (CQ) and 25.3% used ACTs; while in the control group, 44% used CQ and 36% used ACT's. Following the intervention, the percentage using CQ dropped to 56.9%, while those using other drug options improved to 15.7% in the intervention group [Table 3].

At preintervention, 67.3% of drug dosages prescribed were wrong irrespective of the antimalarial drug used in the intervention group, while 60% of all drug dosages were wrong in the control group. Following the intervention, these figures worsened with 74.5% of respondents still getting their drug dosages wrong in the intervention group irrespective of the choice of antimalarial used.

Following a poor response to treatment, 47.3% of respondents in the intervention group refer to a secondary facility, while 21.8% would run laboratory investigations on the patients at pre-intervention. About 64% of respondents in the control group would refer the patient to a secondary facility for management at preintervention. At post-intervention,

Table 2: Diagnosis of malaria in under-fives between intervention and control groups

Mode of diagnosis	Pre-intervention		Post-intervention	
	Intervention (*n*=55); frequency (%)	Control (*n*=50); frequency (%)	Intervention (*n*=51); frequency (%)	Control (*n*=49); frequency (%)
Fever	38 (69.1)	37 (74)	21 (41.2)	22 (44.9)
Lab test	16 (29.1)	8 (16)	30 (58.8)	27 (55.1)
Others*	1 (1.8)	5 (10)	-	-

Pre-intervention: χ^2=5.12, degree of freedom (df)=2, *P*=0.077. Post-intervention: χ^2=0.14, df=1, *P*=0.7. *Includes symptoms unrelated to malaria

Table 3: Treatment of malaria in under-fives between intervention and control groups

Treat malaria	Pre-intervention		Post-intervention	
	Intervention (*n*=55); frequency (%)	Control (*n*=50); frequency (%)	Intervention (*n*=51); frequency (%)	Control (*n*=49); frequency (%)
ACT	14 (25.3)	18 (36)	14 (27.5)	15 (30.6)
CQ	40 (72.7)	22 (44)	29 (56.9)	29 (59.2)
Others*	1 (1.8)	10 (20)	8 (15.7)	5 (10.2)

Preintervention: χ^2=12.9, degree of freedom (df)=2, *P*=0.002. Post-intervention: χ^2=0.68, df=2, *P*=0.7. *Includes amodiaquine only and fansidar. ACT=Artemisinin-combination therapy, CQ=Chloroquine

84.3% of intervention participants would refer to a secondary health facility for management and though there was a similar rise in the percentage of respondents in the control group to 75.5%, there was a statistically significant difference between both groups following the intervention.

Supportive supervision of healthcare workers

Only 32.73% of healthcare workers correctly followed the guidelines at the first supervisory visit. By the third supervisory visit this rose to 70.91%, while 29.09% of them maintained satisfactory performance with minor errors and this increase was statistically significant. ($\chi^2 = 20.15$, $P < 0.001$).

In eliciting main symptoms from the sick child, only 9.09% of healthcare workers correctly followed the guidelines at the first visit with 20% of them having major errors in eliciting symptoms. By the third visit, 81.82% of them could correctly elicit the main symptoms of malaria and this difference was statistically significant. At post-intervention only about 4% of the healthcare workers in the control group could correctly elicit main symptoms of malaria compared with about 82% of healthcare workers in the intervention group and these differences were statistically significant [Table 4].

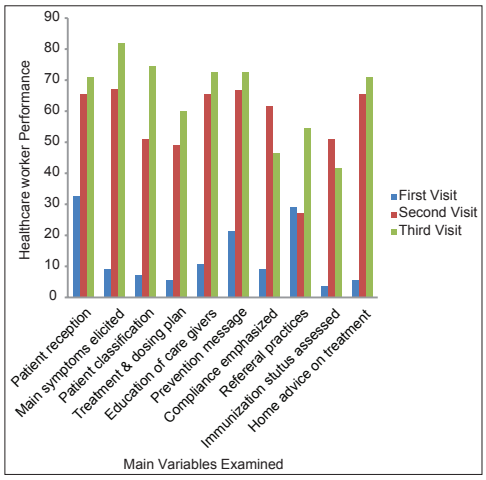

Figure 1: Bar chart showing percentage of healthcare workers correctly following guidelines for malaria case management per supervisory visit in the intervention group

The performance of healthcare workers in treatment and dosing of patients at the first visit showed 33.73% of them had major errors with drug choice and dose, while only 5.45% could correctly treat and dose appropriately. By the third visit, about 58% could prescribe the correct dose and this change was statistically significant. In comparing drug choice and dose between intervention and control groups at post-intervention, there was a statistically significant difference between them with 60% of healthcare workers in the intervention group correctly following the guidelines, while only about 2% of healthcare workers in the control group following the guidelines.

An analysis of the supervisory checklist showed a dramatic increase in performance of healthcare workers with each supervisory visit in the main variables examined with the exception of their referral practices which worsened in the second visit before improving in the third visit. [Figure 1] Average performance after the first supervisory visit was 13% (95% CI: 7.4-20.7%). Average increase in performance between the second and first visit was 44% (95% CI: 34.5-53.8%), while average increase in performance between the third and first visit was 51% (95% CI: 41.2-60.7%).

Discussion

Knowledge, diagnosis, and treatment of malaria

In this study, healthcare workers knowledge at preintervention was good. Following the intervention, knowledge improved further, which was statistically significant at $P = 0.0005$. No statistically significant change was observed in the control group. Workers at this level of care have generally been described as having good knowledge as shown by the survey of knowledge and management of malaria in under-fives among PHC workers in Ibadan, where it was observed that general knowledge of malaria was good with workers

Table 4: Performance in eliciting main symptoms of malaria among healthcare workers in the intervention and control groups

Main symptoms elicited	Supportive supervisory visits			Control group
	Intervention groups			
	First visit; frequency (%)	Second visit; frequency (%)	Third visit; frequency (%)	Third visit; frequency (%)
Minor errors	39 (70.97)	16 (28.09)	10 (18.18)	26 (53.06)
Major errors	11 (20.00)	2 (3.64)	0	21 (42.86)
Correctly followed guidelines	5 (9.09)	37 (67.27)	45 (81.82)	2 (4.08)
Total	55 (100)	55 (100)	55 (100)	49 (100)

Intervention group: χ^2=68.49, degree of freedom (df)=4; P<0.001. Control group: χ^2=97.30, P<0.001

demonstrating good knowledge of several of the key components assessed by the researchers.[17] Similarly, a cross-sectional study of malaria treatment practices and perceptions in Southeast Nigeria also observed good knowledge among PHC workers.[18] This good knowledge did not show in the management practices of the PHC worker as has been observed by other researchers.[19] In this study mean score for malaria case management of under-fives was rather low with minimal changes recorded at post-intervention. This score was an aggregate score of diagnosis, treatment, and referral practices of PHC workers in this study. Disaggregating it however revealed the real problems associated with management.

Firstly, malaria diagnosis was based on a presenting symptom of fever in 69.1% of cases and based on laboratory test in 29.1% of cases at preintervention. These figures were reversed at post-intervention with more PHC workers basing their diagnosis on laboratory investigations (58.8%). The diagnosis of malaria based on fever algorithms is the recommended mode of diagnosis in malaria case management of under-fives among PHC workers in Nigeria as is advocated for in highly endemic countries with poor laboratory support.[16,20] Based on this many healthcare workers are not following recommended guidelines and got low scores for this. The debate on the use or otherwise of fever algorithms and malaria testing with rapid diagnostic test kits as a way of tackling the problem of over diagnosis and treatment of malaria is sending mixed messages to healthcare workers with respect to malaria diagnosis.[20-23]

Another reason why management practice was generally poor is the treatment practices of PHC workers. In this study, most (72.7%) of the healthcare workers prescribe CQ as treatment for malaria. Only about 25% of them prescribe ACT's. At post-intervention, CQ prescription reduced to 56.9% in the intervention group with more healthcare workers making use of other available options which include amodiaquine and fansidar. This finding is consistent with other findings on healthcare workers treatment patterns.[18,24] In the review of case management among PHC workers in Sokoto, 86.2% of respondents commonly prescribed CQ as the first line drug and 4.6% prescribed ACT's with wrong drug dosages in 63.6% of the time.[24] In this study dosages were wrong in 67.3% of cases. Intervention did little to improve this. Poor behavior change among healthcare workers in diagnosis and treatment even following interventions has been numerously commented on.[21,25] The unavailability of ACT's, presumptive treatment, lack of job aids as well as the multiple roles played by the peripheral healthcare workers contribute significantly to this, even in the face of interventions to improve practices. Several theories have been described to explain human behavior and behavior change.[26,27] A combination of these is usually required in aiding healthcare workers to adopt new clinical guidelines or procedures. Based on these models, the major steps in changing healthcare worker behavior will include creating awareness on the need for change, equipping them for the change and providing environment to enable, reinforce, and maintain the change; and will involve strategies targeting both the individual, health facilities, and both.[27]

Effect of supportive supervision of PHC workers

In evaluating the effect of supportive supervision, previous researchers have employed different models with mixed results. These models include supervision as a standalone intervention using supervisory checklists as it was employed in this study, training and supervision, as well as supervision and other interventions such as quality assurance management, as a package of interventions.[3,28,29] The results achieved in this study following supportive supervision were equally mixed. Though healthcare workers performance increased significantly in all parameters examined following supportive supervision, the demonstrable effects on the actual practice of malaria case management, which was a major objective of supportive supervision in this study, were mixed. The use of local government supervisors as facilitators of supportive supervision, which had the inherent advantage of sustainability and ability to respond to the needs and challenges discovered in the course of supervision, did not achieve this.

An analysis of the supervisors' assessment of healthcare workers showed remarkable increase in history taking, examination of the child as well as caregiver education with a 57% (95% CI: 46.85-67.19%) average increase in performance between first and third supervisory visits in the intervention group. This was similar to results achieved in Manila, Philippines where supportive supervision resulted in a 42% (95% CI: 29-55%) average increase in PHC worker performance between baseline and post-intervention.[3] There were statistically significant differences between intervention and control groups at post-intervention which can be attributed to the benefits of supportive supervision over the traditional approach.

There was little concordance with supervisors' assessment of healthcare workers malaria case management practices which have also been noted in other studies.[30]

Malaria case management practices yielded very modest to no improvements following supportive supervision. Despite this lack of concordance between supervisor assessment and researchers' evaluation other studies have demonstrated that there are benefits to supportive supervision. In the study introducing quality assurance methods in the PHC system in Bama LGA of Borno State, Nigeria, supportive supervision, also with the aid of a checklist, showed significant improvement in the ability of healthcare workers to take relevant history and conduct adequate physical examination on children presenting with diarrhea disease.[28] This study used simulated diarrhea cases to assess healthcare workers performance following supervision. Similarly, when examining the effect of training and support (which included job aids and supervision of healthcare workers and supervisors) of healthcare workers in pneumonia case management in Benin, there were demonstrable improvements in case management practices even though untrained health workers diluted the effects observed.[31] Supportive supervision in the presence of training has been shown to increase healthcare worker performance. The Maximisung Access and Quality (MAQ) paper review cited several studies where the presence of training made supportive supervision more effective.[6] In this study, the underlying assumption was that healthcare workers had had training on malaria case management with the updated guidelines prescribing use of ACT's as first line drugs in malaria case management. Majority (78.1%) of healthcare workers interviewed had not had training on malaria case management especially on the new treatment policy. Among those that have had training, over 95% of them are in management positions and are not directly involved in patient management. This scenario could also have diluted the effects of supportive supervision in this study since a majority had not been previously trained on malaria case management. Healthcare workers also faced structural challenges in the discharge of their duties such as low availability of ACT's, absence of job aids, and poor management support amongst others. In-service training, job aids, first line drug availability, and supervision have been identified as predictors of quality in malaria case management.[32] Management support has been recognized as critical to the success and sustenance of supportive supervision, as well as supportive supervision being part of a larger quality improvement process.

Conclusion

This study has demonstrated that supportive supervision is a feasible intervention in increasing malaria case management knowledge among PHC workers as well as increase healthcare performance. It also showed that, given sufficient management support, malaria case management practices have the potential to improve tremendously following supportive supervision. Supportive supervision should be incorporated into existing frameworks for improving healthcare worker performance. There is an urgent need for further studies on supportive supervision of malaria case management that may lead to an improvement in the strategy for supportive supervision.

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