Full Length Research Paper

Limited effects on patient awareness with nurse training in interpersonal communication during antenatal care visits - An explorative study from Cameroon

Niklaus D. Labhardt[1]*, Bernard Cerutti[2], Kaspar Fischer[3], Engelbert Manga[4] and Beat Stoll[5]

[1]Hôpital du Jura, Delémont, Switzerland.
[2]Faculty of Medicine, University of Geneva, Switzerland.
[3]Basel Institute on Governance, Switzerland.
[4]District Hospital of Mfou, Ministry of Public Health, Cameroon.
[5]Institute of Social and Preventive Medicine, University of Geneva, Switzerland.

The objective of this study was to improve by a two day training on interpersonal communication (IPC), the professional communication skills of nurses during antenatal care (ANC), and to obtain higher levels of knowledge among the pregnant women after the visit. The head-nurses of 22 health facilities in 3 rural health districts in Cameroon were randomly assigned to either the intervention group A or the control group B. Participants in group A received at the start of the study a two-day interactive training on ANC emphasizing on IPC skills, whereas participants of group B were trained after 10 months. Group A and B were compared at the start and 10 months later. The effect of training on IPC was measured applying the Roter interaction analysis system (RIAS) to analyze the audio-recorded consultations and by structured patient questionnaires. Only the 128 visits from the twelve providers participating in both assessments were analyzed. The IPC-training increased the frequency of understandable explanations of health topics relevant to pregnant women, particularly HIV/AIDS. Women were significantly better informed about the treatment when consulted by trained providers. In contrast, training appeared to have little influence on women's opportunities to give their points of view (concepts), to ask questions or to address their financial problems regarding the prescribed treatments or procedures. Training of providers in IPC showed some promising, but overall limited effects. Evaluations of communication training with validated tools such as RIAS will help to establish on the long-run IPC-guidelines for primary health care contexts in rural Africa.

Key words: Interpersonal communication, Roter interaction analysis system (RIAS), nurse-training, communication skills, antenatal care, primary health care, Cameroon, Africa.

INTRODUCTION

Antenatal care (ANC) programmes are important vehicles for public-health related activities in Sub-Saharan Africa.

---

*Corresponding author. E-mail: niklaus.labhardt@gmail.com.

Abbreviations: WHO; World Health Organization, ANC; antenatal care, RIAS; Roter interaction analysis system, IPC; interpersonal communication.

Through ANC it is possible to provide a wide range of preventive services to pregnant women, including vaccinations, insecticide-treated bed-nets or enrolment in Prevention of Mother to Child Transmission of HIV services (PMTCT) (Campbell and Graham 2006; Abou Zahr and Wardlaw, 2002). The value reaching large groups of women with a spectrum of health services is reflected in the substantial budgetary resources allocated to ANC (Gay et al., 2003) and in the high and growing

ANC coverage in most Sub-Saharan African countries (WHO, 2008).

Over and above the distribution of medications and preventive tools, antenatal care visits represent an occasion to educate pregnant women about concepts of health and illness and danger signs during pregnancy, as well as a counselling environment where women can express fears and concerns (Murira et al., 2003; Murira et al., 1996). An empathic interaction in a setting where the visitor feels safe greatly increases the benefit derived from the preventive and therapeutic services offered by antenatal care and increased education has a demonstrated positive influence on self-confidence and empowerment (Atuyambe et al., 2008).

However, information and counselling require skill sets different from those commonly needed in the distribution of health care services. The need for health care providers to possess good communication abilities in addition to their medical knowledge and technical competences is not always met in practice. An analysis published by WHO and UNICEF notes that communication skills are frequently inadequate in resource limited settings (Abou Zahr and Wardlaw, 2002). However, before scarce resources can be allocated to any educational program, it is vital that the benefits of such an intervention are properly examined. Research from resource limited settings in Asia and America have shown the efficacy of such training (Kim et al., 2000; Kim et al., 2002; DiPrete-Brown et al., 2000; Roter et al., 1998). But to the best of our knowledge, there has been no thorough examination of the efficacy of even brief communication training of nurses working at the primary health care level in Sub-Saharan Africa. There is a need to expand such research to include such settings.

This paper presents the effects of a two-day training on interpersonal communication (IPC) skills of primary health care nurses in rural Cameroon. The hypothesis was that training would lead to improved prevention and health education during antenatal visits and to higher levels of knowledge among the pregnant women. The effect on communication with patients was measured by the Roter Interaction Analysis System (RIAS) (Roter 2006) and by structured patient questionnaires.

METHODS

Study design

The study was designed to test the hypothesis that training healthcare professionals in communication skills will improve communication between pregnant women and caregivers during antenatal care as well as the women's understanding of issues related to their health.

The design has two components:

1.) Randomisation of clusters (health centers) into group A and B. Group A received as intervention a two-day interactive training on communication skills (A1). Subsequently both groups were compared (A1 versus B1).

2.) Before-after study in each group (A1 - A2 and B1 - B2): Ten months later group B1 received the same intervention (B2) and group A1 participated in a half-day refresher course (A2). Subsequently in each group before-after analysis was performed (A1 versus A2 and B1 versus B2).

In Step 1, the comparison of the intervention with the control group was intended as a proof of concept (A1 vs. B1), whereas Step 2 aimed in a before-after design to examine reproducibility (B1 vs. B2) and sustainability (A1 vs. A2) of hypothesized effects of the intervention. Figure 1 gives an overview of the study procedure.

Intervention

The training was conducted following the Audit approach used for quality management in primary health care (Marshall, 1995). The training was facilitated by experienced local medical and midwife staff as well as by three of the authors of this article. Through group work and role-playing the participants worked out quality criteria for ANC and interpersonal communication skills. At the end of the two-day course, participants agreed on the following criteria facilitating interaction with pregnant women: 1.) Patients need time to ask questions and to express their point of view and financial concerns. 2.) It is important to have a well structured visit which provides appropriate explanations on medical and therapeutic issues that are understandable to the women. 3.) HIV/AIDS issues must be addressed at each visit (Figure 2).

STUDY SETTING

Cameroon has a total fertility rate per woman of 4.5 with a maternal mortality ratio reported in 2000 of 730 per 100'000 life births (WHO, 2006). The nation wide coverage with at least four antenatal visits rose from 52% in the period 1990 - 1999 to 60% in the period 2000 - 2006. The percentage of births attended by skilled health personnel rose in the same time frame from 55% to 63% (WHO, 2008).

The three districts participating in the study, Mfou, Soa, and Obala, are located in the Central Province of Cameroon, near the capital Yaoundé. The population of the three districts is estimated at about 220'000 inhabitants, about two thirds are living in reomote rural villages, the others in small towns. Among the 45 registered public and missionary health care facilities, there are three district hospitals, three peripheral physician clinics, and 39 nurse led clinics (health-centers). The clinics participating in the study perform routine antenatal care visits on a particular day during the week. Women show up in the morning and after a general health education (IEC - information, education and counseling) group session, the individual visits start. There is a high variability among the number of ANC visits per day between the different facilities evaluated (3 - 40).

Selection of facilities and pregnant women

For this study, we selected the 22 facilities with the highest rates of antenatal care visits amongst the total of 45 health care facilities in the three districts. The senior staff member of each facility was then randomly assigned to either the intervention group A or the control group B.

All pregnant women seeking for routine antenatal care in the selected health care facilities were eligible for participation. Those arriving at the center for medical emergency or refusing participation for personal reasons were excluded from the study. We aimed to record a minimum of four and a maximum of six
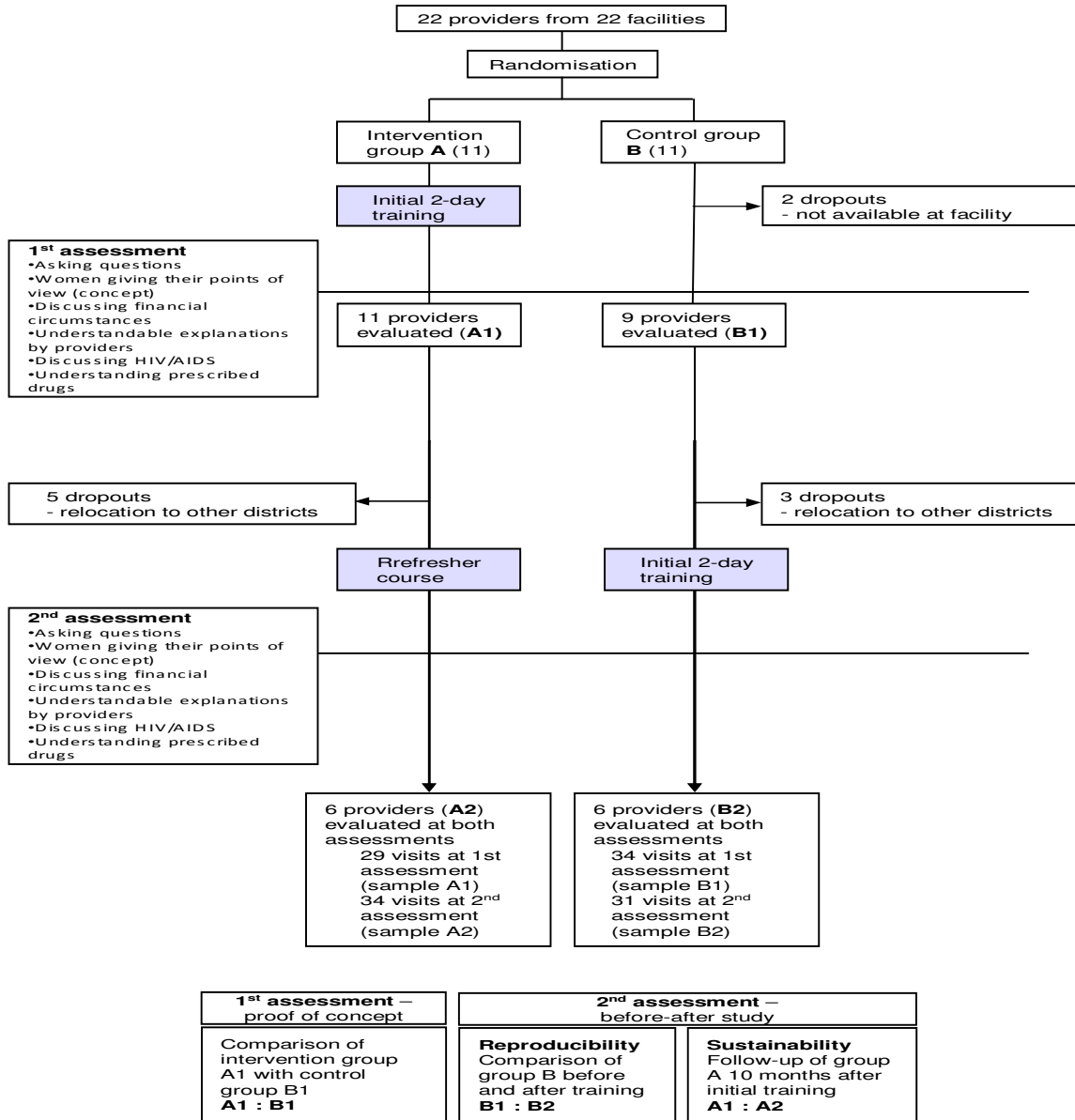
```
                        ┌─────────────────────────────────┐
                        │  22 providers from 22 facilities │
                        └─────────────────────────────────┘
                                     │
                        ┌──────────────────────┐
                        │    Randomisation     │
                        └──────────────────────┘
```

| Intervention group **A** (11) | Control group **B** (11) |

Initial 2-day training

2 dropouts
- not available at facility

1st assessment
•Asking questions
•Women giving their points of view (concept)
•Discussing financial circumstances
•Understandable explanations by providers
•Discussing HIV/AIDS
•Understanding prescribed drugs

| 11 providers evaluated (**A1**) | 9 providers evaluated (**B1**) |

5 dropouts
- relocation to other districts

3 dropouts
- relocation to other districts

| Rrefresher course | Initial 2-day training |

2nd assessment
•Asking questions
•Women giving their points of view (concept)
•Discussing financial circumstances
•Understandable explanations by providers
•Discussing HIV/AIDS
•Understanding prescribed drugs

| 6 providers (**A2**) evaluated at both assessments 29 visits at 1st assessment (sample A1) 34 visits at 2nd assessment (sample A2) | 6 providers (**B2**) evaluated at both assessments 34 visits at 1st assessment (sample B1) 31 visits at 2nd assessment (sample B2) |

1st assessment – proof of concept	**2nd assessment –** before-after study	
Comparison of intervention group A1 with control group B1 **A1 : B1**	**Reproducibility** Comparison of group B before and after training **B1 : B2**	**Sustainability** Follow-up of group A 10 months after initial training **A1 : A2**

Figure 1. Flow-chart describing the process of the study

Input   **Process**   **Output**

Trainees
Senior staff member of each health-care facility

Training by group work and role playing
Elaboration of key elements of good interpersonal communication during ANC visits

Agreement on criteria for successful interaction with pregnant women
- well structured visit
- women can bring in their point of view (concept)
- understandable explanations
- education on HIV/AIDS
- address financial issues

Trainers
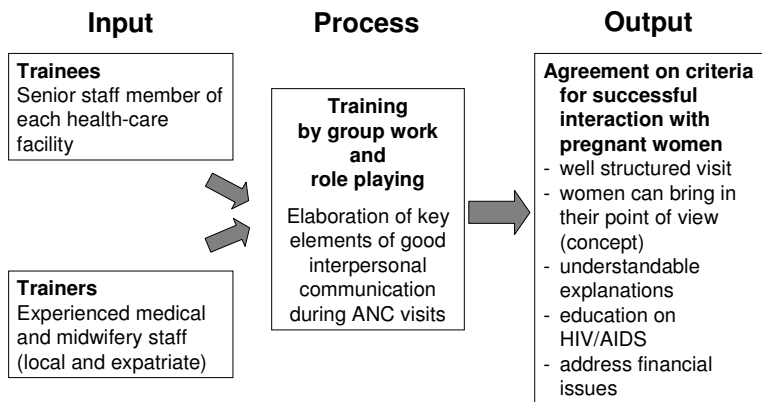Experienced medical and midwifery staff (local and expatriate)

Figure 2. Overview of the training process of the course on interpersonal communication skills. ANC: antenatal care.

different antenatal visits per provider and per assessment. In the case of more than six eligible women within the facility, investigators interviewed the first six women who had agreed to participate in the study. When there were less than four women, investigators returned to the same facility another day to complete the required number of interviews. The investigators approached individual women and gave them oral and written information about the study and its purpose. Pregnant women invited to participate were assured about confidentiality and the possibility to drop out of the study at any time without any negative consequences on the care they would receive. Before participation, all pregnant women gave individual informed consent. The study was approved by the representatives of the Cameroon Ministry of Public Health and a local ethic committee consisting of nurses, physicians and representatives of local community health committees.

DATA COLLECTION AND VARIABLES

The first period of data collection took place from January to March 2005 (first assessment), the second from November to December, 2005 (second assessment). Collected variables were exactly the same in both assessments. They were gathered by structured questionnaires before and after the prenatal visit and by audio-recording of the consultation. The first questionnaire examined the socio-demographic profile of the pregnant women. The second tested the women's knowledge about the prescribed drugs after the visit.

During audio-recording the investigators remained outside in order to guarantee privacy and to avoid interferences in the dialogue between the patient and the care provider.

Analyzed variables

Table 1 displays the independent and dependent variables and their sources. The audio-recorded consultations were analyzed with an adapted version of the Roter Interaction Analysis System (RIAS) (Roter, 2006) using AIRS© software (Fischer, 2005). To date, RIAS has been used in Africa for the assessment of family planning (Abdel-Tawab and Roter 2002; Kim et al., 2000; Kim et al., 1997) and for a cross-sectional survey on curative primary care consultations conducted in the same region of Cameroon as the present study (Labhardt et al., 2009). RIAS is a tool that allows a quantitative description of interactions in medical settings through content-based coding. A coder listens to the recorded consultation and assigns one of 38 mutually exclusive predefined categories to each utterance. An utterance is defined as a statement that contains one conclusive thought; it can be as short as "yes" or consist of a long sentence. It permits the definition of additional items to address specific questions in a given study context. In order to detect opportunities for prevention and health education in our ANC setting, we defined four additional items as the focus of the current study:

1.) Easy understandable medical and therapeutic explanations: utterances in which the provider explicitly explains a medical condition or the reasons why a given drug was prescribed. To fulfill the criteria, the statement made by the provider must be relevant to the actual condition of the woman and easily understandable, even for persons with lower education.

2.) Health concept of women: utterances in which the pregnant woman gives her own vision on her medical condition and exposes her medical concepts in front of the provider such as "I think I don't have enough blood" or "the pregnancy is the cause of my headache", etc.

3.) Discussing HIV/AIDS: utterances in which the provider or the pregnant women address an issue in relation with HIV/AIDS.

4.) Financial issues: utterances in which the providers or the pregnant women talk about financial matters such as access to treatment or cost of diagnostic procedures.

The coders also recorded the number of questions raised by a woman regarding the medical condition of her pregnancy at each visit and the number of questions the woman had planned to ask before the visit (as stated in the interview with the investigators).

Three local Cameroon health care professionals who were not involved in the care of the pregnant women coded the audio-recorded consultations. All underwent a five-day training to acquire competence in RIAS-coding. Audio-recorded consultations were randomly assigned to the different coders who were not aware of the training status of the provider. In order to assure inter-coder accuracy, coders analyzed every fifth consultation in plenary sessions.

STATISTICAL ANALYSES

To examine a potential impact of training, we inferred from the following three null hypotheses:

1.) After the intervention pregnant women have equal opportunities to ask questions, to give their points of view (concepts) and to address their financial problems regarding the prescribed treatments or procedures.

2.) After the intervention providers give as many understandable explanations on HIV/AIDS and other health topics relevant for the pregnant women as before the training.

3.) The level of knowledge among the pregnant women after the prenatal visits remains unchanged after the intervention of the providers.

As explained in the design section, three comparisons were made:

1.) Intervention versus control group; A1 to B1: Group A after training (A1) compared to group B without training (B1).

2.) Before-after study; B1 to B2: Group B without training (B1) compared to group B after training (B2).

3.) Before-after study; A1 to A2: Group A after first training (A1) compared to group A ten months later after a half-day refresher course (A2).

The reported percentages were obtained from the raw data (not the ones estimated from a multivariate model). The link between different outcomes, samples and other variables were investigated with analyses of variance, or logistic regressions as appropriate. For the analysis of audio-recorded visits, the following factors were systematically included in the multivariate model: sample, consultant, level of education of the women, level of urbanisation.

Regarding the number of questions planned to be asked and the questions asked during the consultation, and the number of understood prescribed drugs, the ability of the consultant to speak the local language was also integrated into the model. All displayed p-values, estimated differences and related confidence intervals (method of Sidak) were derived from multivariate models.

RESULTS

Participation

Providers

Twenty health-care providers (11 in the intervention group and 9 in the control group) were available for the initial assessment and 12 (6 in each group) for the second

Table 1. Independent variables that were included in variance or logistic regression analysis and dependent variables reflecting the measured outcomes.

Independent variables	Sources
Provider	
o Provider received the communication training [binary]	
o Provider effect on a individual basis [nominal]	
o Masters the local language [binary]	
Socio-demographic characteristics of the pregnant women	Structured interview with the pregnant women
o Age [continuous]	
o Education [ordinal]	
o Urbanisation [continuous]	
Dependent variables	**Sources**
Frequency of predefined items from analysis of RIAS data	Audio-recorded visits
o Pregnant women asking questions [continuous]	
o Women giving their points of view (concept) [continuous]	
o Addressing financial circumstances [continuous]	
o Understandable explanations by providers [continuous]	
o Discussing HIV/AIDS [continuous]	
Percentage of prescribed drugs where purpose was understood [continuous]	Structured interview after the visit

Table 2. Providers' characteristics. For age and professional experience, the means (standard deviations) are displayed.

	Group A (n = 6)	Group B (n = 6)	p-value
Age (years)	41 (4.9)	40 (5.4)	0.665
Gender	5 F 1 M	1 F 5 M	0.080
Level of medical education			
- Registered nurse (3 years)	4	3	0.999
- Staff nurse (2 years)	2	1	
- Care assistant (1 year)	0	1	
- No diploma	0	1	
	16 years (7.7)	14 years (9.4)	0.794
Professional experience			
Type of Facility			0.182
- District hospital	3	0	
- Public nurse clinic	2	5	
- Confessional nurse clinic	1	1	
Nurse masters local language	5 yes 1 no	2 yes, 4 no	0.242

assessment after 8 months. The dropouts led to differences in the characteristics between the two groups of facilities and providers (Table 2). Only data from antenatal care visits in those twelve providers who participated in both assessments were included in the analysis.

Pregnant women

Of 148 eligible women, 142 agreed to participate in the study. Data from 128 visits were analyzed, with data from 14 visits disqualified because of incomplete data collection

or insufficient audio quality of the recorded consultation. Socio-demographic and medical characteristics of the participating women are displayed in Table 3 and 4. Participants in the intervention group tended to be more urbanized, better educated and with greater financial access to prescribed treatments, reflecting the disparities between the facilities in the two groups.

ANALYSIS OF AUDIO-RECORDED VISITS

Pregnant women asking questions

Forty-four women (34%) stated before the consultation that they intended to ask at least one specific question during the visit. Thirty-one women (24%) asked at least one pregnancy related question during the consultation. Overall, 57% of intended questions were asked. With provider training there was a weak trend (p=0.138) to-wards an increased share of intended questions actually being asked during consultation: intervention group +23% from the first (A1) to the second (A2) assessment (95% CI: -52% to +97%), control group reflecting the disparities between the facilitates in the two +13% from the first (B1) to the second (B2) assessment (95% CI: -71% to +97%).

Pregnant women giving their points of view (concept)

Overall 30 (23%) pregnant women stated their own points of view at least once per consultation. Women who had expressed their concepts received on average 7.1, those not expressing concepts 3.3 understandable explanations per visit (estimated difference 3.3, 95% CI: 0.6 to 6.0; p = 0.001). Provider training did not seem to increase the frequency of discussions of pregnant women's concepts: there was even a significant decrease after the refresher training in group A (estimated difference A1:A2: -3.4, 95% CI: -0.4 to -6.4). They could not afford to pay prescribed diagnostic procedures or therapy on the same day. The financial situation was addressed in 26% of all prenatal visits. Communication training did not appear to influence the discussion about financial topics.

Understandable explanations by providers

At least one understandable explanation was provided in 76 consultations (59%). Providers in the intervention group A1 gave at least one helpful and understandable explanation in 83% of visits (mean 6.6 utterances per visit), compared with 38% in the control group B1 (mean 2.1 per visit; estimated difference A1:B1: 4.2, 95% CI: 0.8 to 7.7).

There was a trend towards improvement with provider training in the control group B2 with at least one explanation given in 61% of consultations (mean 3.2; estimated difference B1:B2: 2.9, 95% CI: -1.7 to 7.6). In contrast, the proportion of visits with understandable explanations in the intervention group after the refresher

course (A2) decreased to 59% (mean 5.1, estimated difference A1:A2: -2.1, 95% CI: -6.1 to 1.9).

Discussing HIV/AIDS

HIV/AIDS was discussed at least once at 43 visits (34%). In 41 of these (95%), the provider raised the topic first. In the intervention group A1, the topic was addressed in 38% of consultations (mean 12.6 utterances per consultation), compared with 0 in the control group B1 (estimated difference A1:B1: 14.1; 95% CI: 2.7 to 25.5). There was a further increase in the percentage of consultations where HIV/AIDS was discussed after the refresher course (A2), to 59% of prenatal visits (mean 24.9 utterances; estimated difference A1:A2: 14.8, 95% CI: 1.5 to 28.1). In the control group, after training (B2) providers discussed HIV/AIDS in 39% of their antenatal visits (mean 5.9, estimated difference B1:B2: 6.1, 95% CI: -7.3 to 19.5).

Understanding of prescribed drugs

In 86 consultations (67%) one or more drugs were prescribed. The most frequently prescribed medications were iron and folic acid supplements, malarial prophy-laxis, and antibiotics in the case of sexually transmitted infections. Overall, women receiving drugs were able to explain the purpose of 68% of prescribed medications. After adjusting for confounding factors, women in the intervention group (A1) understood the purpose of 81% of prescribed drugs compared with 56% in the control group (B1) (p < 0.001). There was a trend towards improvement with training in the control group (B1:B2: +25, 95% CI: -14% to 66%), and towards further improvements in the intervention group after the refresher course (A:A2: +9, 95% CI: -21 to 39%).

DISCUSSION

Although the training of health-care providers in communication skills has been shown to be beneficial in resource-poor settings, the supporting studies so far have been conducted in Asia and America (Kim et al., 2000; Kim et al., 2002; DiPrete-Brown et al., 2000; Roter et al., 1998) and the effects in African settings remain unknown. This small-scale explorative study from Central Came-roon is a first limited attempt to provide such missing data by examining provider-patient interaction during prenatal consultations and the effects of staff training in commu-nication skills. We found that training health-care provid-ers in communication skills increased the frequency of understandable explanations of health topics relevant to pregnant women, particularly HIV/AIDS. Further, after seeing trained providers women were significantly better informed about the treatment they received. In contrast,

Table 3. Socio-demographic characteristics of the 128 pregnant women participating in the study. For continuous variables the means (standard deviations) are displayed. A1: group A after initial two-day training; A2: group A after refresher course; B1: group B before initial two-day training; B2: group B after two-day training.

	Group A (n = 63)		Group B (n = 65)	
Overall value (n = 128)	**A1 (n = 29)**	**A2 (n = 34)**	**B1 (n = 34)**	**B2 (n = 31)**
Age in years (25)	25 (6.2)	25 (6.8)	25 (7.2)	23 (5.9)
Civil status (%)	28	20	15	16
- Married (20)	59	56	73	61
- Concubinage (62)	13	24	12	23
- Single (18)				
Educational level (%)	3.4	23.6	29	39
- No primary education (24.6)	72.2	68	62	55
- Primary education (64)	24.4	8.4	9	6
- Higher education (11.4)				
How many times per month in an urban area (11)				
	15 (13.4)	20(13.3)	6 (8.1)	2 (1.4)
Financial source (%)				
- Herself (1)	0	2.9	0	0
- Family (large) (7)	3.4	5.9	6	13
- Father of the child (91%	93.2	91	94	87
- NA (1)	3.4	0	0	0
Financial access to prescribed treatment(%)	71	87	23	70
- Today (63)	19	13	41	20
- Following days (23)	10	0	32	5
- Never (12)	0	0	4	5
- NA (2)				

Table 4. Medical characteristics of the 128 pregnant women participating in the study. For continuous variables the means (standard deviations) are displayed. A1: group A after initial two-day training; A2: group A after refresher course; B1: group B before initial two-day training; B2: group B after two-day training.

	Group A (n = 63)		Group B (n = 65)	
Overall value (n = 128)	**A1 (n = 29)**	**A2 (n = 34)**	**B1 (n = 34)**	**B2 (n = 31)**
Gravidity (3.1)	2.3 (2.5)	3.6 (2.4)	3.4 (2.3)	2.9 (2.4)
Gestational age in months (6)	5.8 (1.8)	5.9 (1.4)	5.7 (1.8)	6.5 (1.4)
Births (2.2)	2.1 (2.5)	2.4 (2.4)	2.4 (2.3)	1.7 (2.3)
Children alive (1.9)	1.8 (2.3)	2.0 (1.9)	2.1 (2.3)	1.5 (2.1)
Desired pregnancy (%)				
- Yes (70)	76	71	56	81
- No (21)	24	12	44	3.2
- NA (9)	0	18	0	15.8

training appeared to have little influence on women's opportunities to give their points of view (concepts) or to address their financial problems regarding the prescribed treatments or procedures. Positive effects of training on the opportunities for pregnant women to ask questions were not significant.

This study has several limitations. First, drop-out rates were high: only half of the participating facilities were available for the second assessments, severely affecting the statistical power. Second, the drop-outs led to a clear imbalance of characteristics of providers and pregnant women in the two groups. Women served by the facilities in the intervention group A were more urbanized, better educated and economically better off than those in the control group B. Multivariate regression analysis took these factors into account. However, given the small sample size possibilities to correct for these co-variates were limited. The high rate of drop-outs was mainly due

to changes within the health care personnel in Cameroon at the study period, with many nurses changing their workplaces and not being available for the second assessment. As a third limitation, group A had no assessment before training. That limits the possibilities to examine a before-after effect to group B, thereby halving the already small sample-size again. Another possible limitation would also be the variation of educational levels within the providers. The study included registered nurses, as well as staff nurses, nurse assistants and even one person without any diploma. This strongly reflects the reality in the field, where around half of health centers are not staffed with a registered nurse. The limited number of providers made a subgroup analysis impossible. However, a former cross-sectional study in the same area showed no differences in interaction patterns between different levels of medical education (Labhardt et al., 2009).

Over the last two decades it became clear that routine monitoring alone during pregnancy has little impact on maternal mortality (Gay et al., 2003; Chalumeau et al., 2000; Carroli et al., 2001). However, antenatal care visits represent an important opportunity to reach young women with multiple preventive and curative health packages as well as a general education on health and danger signs during pregnancy (Campbell and Graham, 2006; Abou Zahr and Wardlaw, 2002). These complex tasks require empathic interactions in a trustung setting and good professional communication skills (WHO, 2006; WHO, 2002; Atuyambe et al., 2008). However, the few studies conducted in Africa on this topic indicate that provider-client interactions seldom achieve these goals (Abou Zahr and Wardlaw, 2002; Bawa et al., 2004). In at least one case, the authors conclude that the lack of good professional communication contributed to high maternal mortality (Anya et al., 2008). Pregnant women frequently feel mistreated and humiliated at visits (Grossmann-Kendall et al., 2001), receive few explanations and are given few opportunities to ask questions (Kim et al., 1999). However, although the need is obvious for effective tools to train staff efficiently in communication skills, there is very little published research available on staff training in communication skills in Sub-Saharan Africa.

Although our data permit only cautious conclusions, it is notable that short training improved active communication skills such as giving explanations and discussing HIV/AIDS much more than passive skills. Active skills may be easier to acquire as they require less understanding of the dynamics of interactions with patients. Passive and coaching skills, encouraging patients actively to ask questions and stating points of view, need a longer and more intensive training. Further, the limited success may be related to the quality of the two-day training itself, which may not have taken the providers' needs and level of knowledge sufficiently into account. Many providers may have needed more basic training in antenatal care

before focusing on interpersonal communication skills during visits.

Moreover, the training in the control group B at 10 months appears to have been less effective than the initial training in the intervention group. This may be due to differences in the conduct of training, mainly because of a different composition of facilitators. However, the lack of baseline data from the intervention group A before training and the limited size of the provider-sample preclude speculation on this issue.

It is also possible that short trainings are insufficient to change communication patterns. Kim et al. have shown that regular self-assessment and peer review of providers after a course in communication skills in Mexico and Indonesia can considerably reinforce the effect of training (Kim et al., 2000; Kim et al., 2002). However, such a resource-intensive approach is currently not feasible in our context of rural Cameroon.

Our results contrast with reports from brief trainings in Tobago, Trinidad and Honduras, respectively (DiPrete-Brown et al., 2000; Roter et al., 1998), where patients became much more active during consultations with health care providers who underwent a similarily short training on communication skills. However, a comparision with our study is difficult, as they have a different patient population and the participating providers were physicians. Training nurses might be different from training physicians, as indicated by a review of patient-nurse-interaction in high-income countries in 2000, which found no or only a limited effect from training nurses in patient-interaction (Kruijver et al., 2000). To our knowledge there are no similar reports from low- and lower middle-income countries. Given the high importance of nurse-clinicians in preventive as well as in curative care in Sub-Saharan Africa (Stilwell et al., 2008) there is clearly a need for further research.

In conclusion, this study once more underlines the importance of interpersonal communication skills during antenatal care in resource-limited settings such as rural Cameroon. Even though the impact was limited, training of providers in interpersonal communication showed some promising effects. For the future we suggest integrated antenatal care trainings for health care providers that devote a significant part to professional communication distinguishing between active (educating) and passive (listening) skills for a good interaction. Our findings further emphasize the importance to evaluate trainings with validated tools such as RIAS in order to measure the effect and establish on the long-run guidelines for the training of interpersonal communication skills in primary health care contexts in rural Africa.

ACKNOWLEDGEMENTS

study. Moreover, our thanks go to Adélaïde Beffolo, Sabine Madélaine Aboa and Dr. Edwige Belinga for having coded the recorded consultations and Dr. Pelle Stolt for his helpful comments on the manuscript.

REFERENCES

Abdel-Tawab N, Roter D (2002). The relevance of client-centered communication to family planning settings in developing countries: lessons from the Egyptian experience, Social science and medicine *(1982)*. 54(9): 1357-68.

Abou Zahr C, Wardlaw T (2002). Antenatal care in developing countries: promises, achievements and missed opportunities-an analysis of trends, levels and differentials. WHO&UNICEF (available at: http://www.who.int/reproductivehealth/en/).

Anya SE, Hydara A, Jaiteh LE (2008). Antenatal care in The Gambia: missed opportunity for information, education and communication. BMC pregnancy and childbirth. 8 p. 9.

Atuyambe L, Mirembe F, Annika J, Kirumira EK, Faxelid E (2008). Seeking safety and empathy: Adolescent health seeking behavior during pregnancy and early motherhood in central Uganda, J. adolesc. p. 781-796.

Bawa SB, Umar US, Onadeko M (2004). Utilization of obstetric care services in a rural community in southwestern Nigeria, Afr. J. med. Med. Sci. 33(3): 239-44.

Campbell OMR, Graham WJ (2006). Strategies for reducing maternal mortality: getting on with what works, The Lancet. 368(9543): 1284-99.

Carroli G, Rooney C, Villar J (2001). How effective is antenatal care in preventing maternal mortality and serious morbidity? An overview of the evidence, Paediatric and perinatal epidemiology, 15 Suppl 1: 1-42.

Chalumeau M, Salanave B, Bouvier-Colle MH, de Bernis L, Prual A, Bréart G (2000). Risk factors for perinatal mortality in West Africa: a population-based study of 20326 pregnancies. MOMA group, Acta paediatrica *(*Oslo, Norway *:* 1992*)*, 89(9): 1115-21.

DiPrete-Brown L, de Negri B, Hernandez O, Dominguez L, Sanchack JH, Roter D (2000) An evaluation of the impact of training Honduran health care providers in interpersonal communication, Int. j. qual. health care : j. Int. Soc. Qual. Health Care / I*SQua*, 12(6): 495-501.

Fischer K (2005). Airs 0.6, Airs software. (Software available at: http://www.dreizak.com)

Gay J, Hardee K, Judice N, Agarwal K, Fleming K, Hairston A, Walker B, Wood M (2003). What Works: A Policy and Program Guide to the Evidence on Family Planning, Safe Motherhood, and STI/HIV/AIDS Interventions: Module 1: Safe Motherhood, Policy Project: Washington DC. p. 1-183.

Grossmann-Kendall F, Filippi V, De Koninck M, Kanhonou L (2001). Giving birth in maternity hospitals in Benin: testimonies of women, Reproductive health matters, 9(18): 90-8.

Kim YM, Figueroa ME, Martin A, Silva R, Acosta SF, Hurtado M, Richardson P, Kols A (2002). Impact of supervision and self-assessment on doctor-patient communication in rural Mexico. J. Int. Soc. Qual. Health Care / I*S*Qua, 14(5): 359-67.

Kim YM, Kols A, Mwarogo P, Awasum D (2000). Differences in counseling men and women: family planning in Kenya, Patient education and counseling. 39: 37-47.

Kim YM, Odallo O, Thuo M, Kols A (1999). Client Participation and Provider Communication in Family Planning Counseling: Transcript Analysis in Kenya, Health Communication.11(1): 1-19.

Kim YM, Putjuk F, Endang B, Kols A (2000).Self-Assessment and Peer Review: Improving Indonesian Service Providers' Communication with Clients, International family planning perspectives 26: 4-12.

Kim YM, Thuo M, Kols A (1997). Client-Provider Communication in Family Planning: Assessing Audiotaped Consultations from Kenya. Working Paper Number 5. Baltimore, Johns Hopkins University School of Public Health. p. 1-64.

Kruijver IP, Kerkstra A, Francke AL, Bensing JM, van de Wiel HB (2000). Evaluation of communication training programs in nursing care: a review of the literature, Patient education and counseling. 39(1): 129-45.

Labhardt ND, Schiess K, Manga E, Langewitz W (2009). Provider-patient interaction in rural Cameroon-How it relates to the patient's understanding of diagnosis and prescribed drugs, the patient's concept of illness, and access to therapy, Patient education and counseling. p. 196-201

Marshall M (1995) The MSD Foundation, London. p. 1-240.

Murira N, Lützen K, Lindmark G, Christensson K (2003). Communication patterns between health care providers and their clients at an antenatal clinic in Zimbabwe. Health care women Int. 24(2): 83-92.

Murira N, Munjanja SP, Zhanda I, Lindmark G, Nystrom L (1996). Health education for pregnancy care in Harare. A survey in seven primary health care clinics, The Central Afri. j. med. 42(10): 297-301.

Roter D, Rosenbaum J, De Negri B, Renaud D, DiPrete-Brown L, Hernandez O (1998).The effects of a continuing medical education programme in interpersonal communication skills on doctor practice and patient satisfaction in Trinidad and Tobago, Medical Education. 32(2): 189.

Roter DL (2006). The Roter Method of Interaction Process Analysis (Accessed September 5, 2008 at http://www.rias.org), .

Stilwell B, Wilson A, McCaffery J (2008). Non-physician clinicians in sub-Saharan Africa, Lancet, 371(9624): 1578.

World Health Organization (2002)Standards for Maternal and Neonatal Care. World Health Organisation (Available at: http://www.who.int/reproductive-health/publications/standards/effective_antenatal_care.pdf.

World Health Organization (2006). Pregnancy, childbirth, postpartum and newborn care: a guide for essential practice. World Health Organization Geneva, Switzerland (Accessed December 30, 2008 at: http://www.who.int/reproductive-health/publications/pcpnc/).

World Health Organization. (2006)Country Health System Fact Sheet 2006 Cameroon, Fact Sheet.

World Health Organization. (2008) World Health Statistics 2008, World Health Statistics.