

## RESEARCH ARTICLE

## Evaluation of Provider Skills in Performing Visual Inspection with Acetic Acid in the Cervical Cancer Screening Program in the Meknes-Tafilalet Region of Morocco

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### Abstract

**Background:** This study documented the performance of providers of visual inspection with acetic acid (VIA) at primary health centers, assessing their compliance with the VIA skills checklist and determinants of non-compliance, and exploring their perceptions of VIA training sessions. **Materials and Methods:** A cross-sectional study was conducted among VIA providers in the Meknès-Tafilalet region of Morocco. Structured observation of their performance was conducted through supervisory visits and multiple focus group discussions (FGDs). **Results:** Performance of all the recommended steps for effective communication was observed in a low proportion of procedures (36.4%). Midwives/nurses had higher compliance than general practitioners (GPs) ( $p < 0.001$ ). All recommended steps for VIA examination were performed for a high proportion of procedures (82.5%). Compliance was higher among midwives/nurses than among GPs ( $p < 0.001$ ) and among providers in rural areas than those in urban areas ( $p < 0.001$ ). For pre-VIA counselling, all recommended steps were performed for only 36.8% of procedures. For post-VIA counseling, all recommended steps were performed in a high proportion (85.5% for VIA-negative and 85.1% for VIA-positive women). Midwives/nurses had higher compliance than GPs when advising VIA-positive women ( $p = 0.009$ ). All infection prevention practices were followed for only 14.2% of procedures, and compliance was higher among providers in rural areas than those in urban areas ( $p < 0.001$ ). Most FGD participants were satisfied with the content of VIA training sessions. However, they suggested periodic refresher training and supportive supervision. **Conclusions:** Quality assurance of a cervical cancer screening program is a key element to ensure that the providers perform VIA correctly and confidently.

**Keywords:** Visual inspection using acetic acid - quality assurance - screening program - cervical cancer - Morocco

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### Introduction

Cervical cancer is the second most common cancer in women, after breast cancer in Morocco (Ferlay, et al., 2013). It is estimated that there are 2258 new cases per year (14.3 per 100 000 person-years), diagnosed at very late stages (Berraho et al., 2012; Ferlay et al., 2013). Visual inspection with acetic acid (VIA)-based screening is currently being recommended as a potential alternative to conventional cytology in the early detection of cervical neoplasm program for developing countries (IARC, 2005).

In 2010, VIA was selected by the Ministry of Health (MoH) and scientific societies of Morocco to be the screening test in the national program for early detection of cervical cancer to screen women aged 30-49 years at a 3-year interval. The test is provided at primary health

centers by trained general practitioners (GPs), midwives, and nurses, all of whom were female. All VIA-positive women are referred for colposcopy and directed biopsies (if required). Treatment by loop electrosurgical excision procedure (LEEP) is offered to those with cervical intraepithelial neoplasia (CIN). The colposcopy and treatment services are provided at the cancer early diagnosis centers that have been built across the country as a secondary level of care (Selmouni et al., 2016).

The VIA screening program was initiated in the region towards the end of 2010. By 2014, VIA screening was offered in 122 of the 172 primary health centers in the region. Three diagnostic centers have been built and equipped to provide colposcopy, biopsy, and LEEP in the region. Women with suspected or diagnosed cervical cancer are referred to a regional oncology center for

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management.

The VIA providers were trained by the heads of the department of obstetrics and gynecology of the Faculty of Medicine and Pharmacy using the training materials and teaching aids developed by the Moroccan MoH, the Lalla Salma Foundation, and the International Agency for Research on Cancer (IARC) (Lalla Salma Association Against Cancer 2011; Sancho et al., 2013; Sellors and Sankaranarayanan 2003; Sankaranarayanan and Wesley 2003). A checklist was used for skills training in VIA and counseling and the providers were advised to follow the same checklist during routine services.

VIA screening requires high-quality training of providers and sustained and continuous quality assurance to ensure that the services are rendered as per the protocol and training. The current study assessed the performance of the VIA providers at the primary health centers in the Meknès-Tafilalet region by documenting their compliance with the VIA protocols and adherence to the skills checklist and identified some determinants of non-compliance. The study also documented the perceptions of the VIA service providers about the quality of training and the scope for improvement.

## Materials and Methods

### *Study design and participants*

A cross-sectional study was conducted among the providers of VIA in the Meknès-Tafilalet region. A structured evaluation of their performance (Glesne 2010; Kolb 2012) was done, and their perceptions about training were documented through multiple focus group discussions (FGDs) (Kolb 2012; Bogdan and Biklen 2006). The performance evaluation was conducted using the same VIA performance checklist used during training. The checklist was prepared in consultation with the master trainers and had previously been field-tested. The checklist consisted of three sections: (i) communicating appropriately with the clients, (ii) steps of obtaining personal and medical history, and (iii) steps of VIA procedures as per standard norms, including pre-VIA counseling, VIA testing, infection control tasks, post-VIA counseling, and documentation. The providers were assessed objectively to ascertain whether they could satisfactorily perform each step listed in the checklist.

A total of 24 (20%) health centers in the Meknès-Tafilalet region were selected from the 122 centers actively providing VIA screening across the six provinces in the region. For each province, 20% of the centers providing VIA services were selected from rural and urban areas using a simple random sample design proportional to the number of health centers in urban and rural areas. The selection of the providers for each center was limited to those trained within the program.

A group of experts in screening and management of cervical precancers was selected to conduct the supervisory visits to the health centers. The group consisted of six trained GPs (all female) with more than 3 years of experience in performing VIA. The experts were trained over 3 days on the research protocol and supervision of the VIA providers using the VIA checklist. The team visited

one health center a day to observe providers performing VIA testing. One expert at a time assessed one provider. It was decided that each expert would evaluate at least 10 VIA procedures in each center.

The FGDs (N=3) were conducted with the VIA service providers (GPs and midwives/nurses) in the region using an interview guide. A total of 30 VIA service providers were randomly selected from the pool of VIA-trained providers of the included health centers and were invited to participate in FGDs. A total of 23 of them attended the FGDs. FGDs were moderated by a researcher well trained in communication. The questions were focused to document the providers' perceptions and opinions about the VIA training being offered in the program. The proceedings of the discussion were written down, and the relevant information was abstracted later.

This study was initiated by the NoH and the Fondation Lalla Salma, Prévention et traitement des cancers of Morocco. Ethical approval was given by the Ethics Committee of Fez University Hospital Center. All the participants in the study were informed of the nature and objectives of the study, and verbal consent was obtained.

### *Statistical analysis*

Quantitative data were captured and analyzed using Stata Software. A descriptive analysis was conducted; categorical variables were summarized with frequencies and proportions, and continuous variables were summarized with means and standard deviations (SD). The results were compared by the setting and profile of the providers using Pearson's chi-squared test and P values less 0.05 were taken as significant.

Qualitative data were analyzed by the constant comparative method (Miles and Huberman 1994; Gysels et al., 2004), key responses were coded, the codes were grouped into similar meanings, and then categories or themes were formed (Maskor et al., 2013).

## Results

### *Evaluation of VIA performance*

A total of 30 providers (23 midwives/nurses and 7 GPs) were evaluated while counseling and performing VIA procedures on 343 women. Some of these women (N=16) refused to undergo VIA after counseling; for them, only the pre-VIA counseling procedure could be evaluated. Midwives/nurses performed the majority of the procedures (N=305). Nearly half (42%) of these observations were made in rural health centers. The providers had been performing VIA screening for 1-3 years, depending on the year of implementation of the program in the particular province. The VIA test was positive in 50 (15.3%) of the 327 women screened.

The number and proportions of the counseling and VIA procedures performed according to the steps listed in the skills checklist are given in Table 1. The completeness of assessment was high, with a low frequency of missing data, ranging from 0% to 2% for various sections in the checklist.

The evaluation of communication skills demonstrated that performance of all the recommended steps was

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observed in a low proportion (36.4%) of procedures. Midwives/nurses had higher compliance with the rules of effective communication than GPs ( $p < 0.001$ ). In the majority of the procedures, the health professionals greeted the women with respect (97.7%), listened actively (73.8%), directly addressed the questions asked by the women (83.0%), and provided correct information (88.1%). Some of the deficiencies commonly noted were that the providers did not encourage the women to ask questions (done in only 48% of procedures) and often neglected to verify whether the women had understood (done in only 44% of procedures). Comparing performance between settings, we noted that active listening was performed better in rural areas than in urban

**Table 1. Assessment of Different Steps of VIA Performed by the Providers Following the Evaluation Checklist, by Setting and Profile**

Checklist item	Number of performances achieving standards (%)						
	Setting				Profile of providers		
	Combined (N=343)*	Urban (N=198)*	Rural (N=145)*	P value	Midwives/nurses (N=305)*	GPs (N=38)*	P value
<b>Communication skills evaluation</b>							
Greet woman with respect	335 (97.7)	194 (97.9)	141 (97.2)	0.654	300 (98.4)	35 (92.11)	0.016
Listen actively to woman	253 (73.8)	137 (69.2)	116 (80.0)	0.025	239 (78.4)	14 (36.8)	<0.001
Answer questions directly	285 (83.0)	158 (79.8)	127 (87.6)	0.057	271 (88.8)	14 (36.8)	<0.001
Assist woman in making her own decision	212 (61.8)	118 (59.6)	94 (64.8)	0.325	183 (60.0)	29 (76.3)	0.051
Encourage woman to ask questions	166 (48.4)	96 (48.5)	70 (48.2)	0.969	163 (53.4)	3 (7.9)	<0.001
Provide correct information to woman	302 (88.1)	176 (88.9)	126 (86.9)	0.574	273 (89.5)	29 (76.3)	0.018
Ask woman for feedback	152 (44.3)	85 (42.9)	67 (46.2)	0.546	139 (45.6)	13 (34.2)	0.184
All recommended steps performed correctly	125 (36.4)	72 (36.4)	53 (36.5)	0.971	123 (40.3)	2 (5.3)	<0.001
<b>Ensuring woman's privacy</b>							
Use separate and private area	294 (89.9)	159 (85.0)	135 (96.4)	0.001	260 (89.0)	34 (97.1)	0.133
Use sheets to cover woman during examination	145 (44.3)	78 (41.7)	67 (47.8)	0.268	127 (43.5)	18 (51.4)	0.372
All recommended steps performed correctly	124 (37.9)	61 (32.6)	63 (45.0)	0.022	106 (36.3)	18 (51.4)	0.081
<b>Pre-VIA counseling</b>							
Make clear how VIA test is done	166 (50.7)	89 (47.6)	77 (55.0)	0.185	141 (48.3)	25 (71.4)	0.01
Explain that VIA test is painless	133 (40.8)	73 (39.2)	60 (42.8)	0.512	115 (39.5)	18 (51.4)	0.176
Ask woman for verbal consent	321 (98.1)	183 (97.8)	138 (98.5)	0.636	286 (98.0)	35 (100)	0.392
All recommended steps performed correctly	120 (36.8)	66 (35.5)	54 (38.6)	0.567	102 (35.0)	18 (51.4)	0.058
<b>Preparation for VIA testing</b>							
Use sterile materials	322 (98.5)	185 (98.9)	137 (97.8)	0.434	287 (98.3)	35 (100)	0.435
Prepare acetic acid according to the standards	294 (90.0)	164 (87.7)	130 (92.8)	0.126	259 (88.7)	35 (100)	0.036
Wash hands thoroughly with soap and water	51 (16.0)	32 (17.1)	19 (13.5)	0.383	49 (16.78)	2 (5.7)	0.088
Put on examination gloves	299 (91.44)	177 (94.6)	122 (87.1)	0.016	264 (90.4)	35 (100)	0.055
All recommended steps performed correctly	49 (15.0)	30 (16.0)	19 (13.6)	0.536	47 (16.1)	2 (5.7)	0.104
<b>VIA testing</b>							
Insert speculum; adjust so that entire cervix is seen	307 (93.88)	170 (90.9)	137 (97.8)	0.009	273 (93.5)	34 (97.1)	0.395
Examine cervix using an adequate light source	313 (95.7)	173 (92.5)	140 (100)	0.001	278 (95.2)	35 (100)	0.185
Apply acetic acid with appropriate dilution	316 (96.6)	179 (95.7)	137 (97.8)	0.289	281 (96.2)	35 (100)	0.243
Observe cervix at least 1 minute after application of acetic acid, and record change	280 (85.9)	151 (80.7)	129 (92.8)	0.002	263 (90.4)	17 (48.6)	<0.001
All recommended steps performed correctly	269 (82.5)	141 (75.4)	128 (92.0)	<0.001	252 (86.6)	17 (48.6)	<0.001
<b>Infection control tasks</b>							
Remove gloves by turning inside out	251 (78.5)	144 (78.7)	107 (78.1)	0.900	222 (77.6)	29 (85.3)	0.304
Dispose of gloves by placing in leak-proof container	159 (49.7)	83 (45.3)	76 (55.4)	0.073	136 (47.5)	23 (67.7)	0.027
Wash hands thoroughly with soap and water	77 (23.7)	39 (21.2)	38 (27.1)	0.213	74 (25.5)	3 (8.8)	0.03
Decontaminate instruments	197 (61.1)	106 (57.9)	91 (65.4)	0.169	178 (62.0)	19 (56.0)	0.503
All recommended steps performed correctly	45 (14.2)	14 (7.7)	31 (22.8)	<0.001	44 (15.5)	1 (3.0)	0.047
<b>Post-VIA counseling</b>							
Inform woman about her result	317 (97.2)	180 (96.2)	137 (98.5)	0.209	284 (97.6)	33 (94.3)	0.259
<b>Advice for women with negative test</b>							
Advise woman to return for repeat test after 3 years	235 (85.5)	129 (86.5)	106 (84.1)	0.566	209 (85.0)	26 (90.0)	0.498
<b>Advice for women with positive test</b>							
Explain to the woman the necessity of further investigations	45 (95.7)	36 (97.3)	9 (90.0)	0.310	42 (95.5)	3 (100)	0.706
Provide document recommending further investigations	44 (93.6)	34 (91.8)	10 (100)	0.352	42 (95.5)	2 (67.0)	0.048
Comfort worries and fears of the woman	44 (93.6)	34 (91.8)	10 (100)	0.352	42 (95.5)	2 (67.0)	0.048
All recommended steps performed correctly	40 (85.1)	31 (83.8)	9 (90.0)	0.624	39 (89.0)	1 (33.3)	0.009
<b>Documentation</b>							
Fill out VIA record	263 (80.9)	161 (86.1)	102 (73.9)	0.006	236 (81.4)	27 (77.1)	0.547
Record VIA result in VIA record	282 (86.7)	167 (89.3)	115 (83.3)	0.116	251 (86.5)	31 (89.0)	0.739
Note down decision made in VIA record	271 (83.3)	153 (81.8)	118 (85.5)	0.377	241 (83.1)	30 (86.0)	0.695
Classify records to ensure confidentiality	210 (64.6)	135 (69.5)	80 (57.9)	0.029	183 (63.1)	27 (77.1)	0.101
All recommended steps performed correctly	170 (52.1)	98 (52.1)	72 (52.1)	0.993	149 (51.4)	21 (60.0)	0.335

\*The total number varies between items either because of missing data or because certain skills are not applicable in some situations; GPs: general practitioners

areas ( $p=0.025$ ).

Certain deficiencies were observed in both pre-VIA and post-VIA counseling. For pre-VIA counseling, all recommended steps were performed in only 36.8% of procedures; many of the providers did not explain the details of the test procedure (done in only 50.7% of procedures). For post-VIA counseling, all recommended steps were performed in a high proportion of procedures (85.5% for VIA-negative women and 85.1% for VIA-positive women). Nearly 15% of the VIA-negative women were not advised about the necessity of returning after 3 years for repeat screening. Almost all the women were informed of their results, and almost all the VIA-positive women were counseled appropriately. No significant difference was observed in this regard between rural and urban areas. However, we noted that midwives/nurses had higher compliance than GPs when advising VIA-positive women ( $p=0.009$ ).

All recommended preparatory steps for VIA were performed correctly in only 15% of procedures. Inadequacies were observed in some of the key steps. In 10% of the procedures, diluted 3-5% acetic acid was not prepared as per the guidelines. Gloves were used in a larger proportion of procedures in urban areas than in rural areas ( $p=0.016$ ).

The proportion of procedures in which all recommended steps for VIA examination were performed was high (82.5%). Once again, compliance was higher among midwives/nurses than among GPs ( $p<0.001$ ) and among providers in rural areas than those in urban areas ( $p<0.001$ ). However, in 14% of the VIA procedures, the providers did not wait for the recommended one minute after applying acetic acid to the cervix.

All infection prevention practices were followed in only 14.2% of procedures, and compliance was higher among providers in rural areas than those in urban areas ( $p<0.001$ ). Hand hygiene and decontamination of medical instruments were observed to be deficient in a large proportion of procedures. The providers washed their hands before and after the examination in only 16% and 24% of the procedures, respectively. In only 61.1% of the

procedures were the vaginal specula and other instruments immersed in a bucket containing 0.5% chlorine solution immediately after use (decontamination step). In the remaining observations (38.9%), the providers delayed the decontamination of the materials.

All the documentation procedures were completed appropriately in 52.1% of the procedures. Some differences were observed between the urban and rural areas; VIA records were filled out correctly and classified to ensure confidentiality in a larger proportion of procedures in urban areas ( $p=0.006$  and  $p=0.029$ , respectively).

The VIA providers were trained to obtain and document the personal and medical history of all the women attending screening. These data included current age, use of hormonal contraception, date of last menstrual period and characteristics of menstrual cycle, age at first sexual intercourse, tobacco use and alcohol consumption, number of sexual partners, number of sexual partners of husband, previous history of sexually transmitted infections (STIs), and symptoms suggestive of cervical cancer. The experts also checked whether the providers asked specific questions to obtain appropriate personal and medical history prior to screening. These observations are listed in Table 2. Almost all the providers noted the age of the women, but only 36% asked whether the women had any of the common symptoms suggestive of cervical cancer. The providers in rural areas had higher compliance than those in urban areas in enquiring about antecedent STIs ( $p<0.001$ ), number of partners ( $p=0.001$ ), and symptoms suggestive of cervical cancer ( $p=0.001$ ).

#### Outcomes of the FGDs

The focus groups included 11 nurses, 4 midwives, and 8 GPs. Among the participants, 38% were older than 50 years and 86% were female. The average number of years of service was 12.1 years (SD: 8.7 years) for the participants.

The participants acknowledged that adequate efforts were being made to improve the skills of the providers involved in the program and that the training was useful while practicing VIA. However, they expressed the need

**Table 2. Assessment of Completeness of History Taking by the VIA Providers for the Women Undergoing VIA**

Personal and medical history	Number of providers achieving standards (%)						
	Setting				Profile		
	Combined (N=327)*	Urban (N=187)*	Rural (N=140)*	P value	Midwives/nurses (N=292)*	GPs (N=35)*	P value
Age	325 (99.7)	186 (86.0)	139 (99.2)	0.248	290 (99.7)	35 (100)	0.728
Marital status	283 (86.8)	160 (86.0)	123 (87.8)	0.628	251 (86.3)	32 (91.4)	0.393
Date of last menstruation	281 (86.4)	166 (89.7)	115 (82.1)	0.048	247 (85.2)	34 (97.1)	0.051
Characteristics of menstrual cycle	265 (81.5)	157 (84.8)	108 (77.1)	0.076	233 (80.3)	32 (91.4)	0.110
Hormonal contraception use	277 (84.9)	169 (90.8)	108 (77.1)	0.001	247 (84.8)	30 (85.7)	0.896
Age at first sexual intercourse	83 (25.6)	47 (25.5)	36 (25.7)	0.972	80 (27.7)	3 (8.6)	0.014
Antecedent STIs	57 (17.5)	20 (10.8)	37 (26.4)	<0.001	46 (16.0)	11 (31.4)	0.022
Alcohol consumption	125 (38.4)	75 (40.3)	50 (35.9)	0.425	106 (36.5)	19 (54.3)	0.042
Tobacco use	127 (39.0)	75 (40.3)	52 (37.4)	0.594	109 (37.6)	18 (51.4)	0.113
Hormone replacement therapy	134 (41.3)	89 (48.1)	45 (32.3)	0.004	114 (39.5)	20 (57.1)	0.004
Number of partners	20 (6.1)	4 (2.1)	16 (11.4)	0.001	18 (6.2)	2 (5.7)	0.909
Number of partners of husband	13 (4)	5 (2.7)	8 (5.7)	0.170	12 (4.1)	1 (3.0)	0.715
Symptoms suggestive of cervical cancer	117 (35.9)	52 (27.9)	65 (46.4)	0.001	102 (35.0)	15 (43.0)	0.363

\*The total number varies between items because of missing data; STIs: sexually transmitted infections

for training of more staff in the health services to ensure the availability of adequately trained staff to replace those moving away or retiring.

The majority of the providers were satisfied with the content of the VIA course curriculum, both the theoretical and practical components. The manuals and the course materials handed out during training were considered to be useful and adequate.

The FGD participants made useful suggestions about the scope for improvement in the training program; they suggested refresher courses on a regular basis, extension of the duration of the practical training, and post-training supervision (mentoring). To facilitate the training of providers, they recommended that each region should have at least one master trainer so that a pool of trainers could be created through a cascade effect. They also suggested that the VIA training should be introduced in the basic training courses for nurses and midwives, as well as for GPs in the nursing and medical faculties.

The FGD participants also reported that some of the providers who had been trained were not involved in the screening program, leading to a waste of resources and a shortfall of trained providers in some health centers, and that this should be avoided. To help the providers increase awareness in the community, they recommended training of the health care providers involved in other programs.

## Discussion

Our study reports a very important aspect of quality assurance of a VIA-based screening program, which is periodic evaluation of the performance of the VIA providers. We developed and implemented a model to assess VIA performance that is integrated into the real program and is replicable. The assessment took into consideration the entire range of activities by the providers, including pre-procedure counseling, the actual procedure, post-procedure counseling, documentation, and infection control measures.

Through a systematic assessment, our study identified some of the deficiencies that could have impacts not only on the test quality but also on client satisfaction, compliance, and safety. Counseling by the VIA providers was of suboptimal quality in certain aspects. Such observations have also been made in VIA programs in other developing countries, such as Thailand and Ghana (Sanghvi et al., 2008). The providers often tend to disregard this crucial aspect of screening, which affects the women's satisfaction with the overall care received, and thereafter their adherence to the VIA program (Vedantham et al., 2010; Irving and Dickson 2004). High-quality counseling is largely dependent on the communication skills of the provider, which can be improved substantially through appropriate training (Fallowfield et al., 1998; Parle et al., 1997).

The accuracy of VIA, and as a result the overall quality of the program, can suffer if the providers omit some critical steps, such as examining the cervix with the naked eye before applying acetic acid, ensuring that the acid used is freshly prepared and diluted to the appropriate concentration, and waiting for at least 1 minute after

application of acetic acid to the cervix before reporting. We observed that some of the providers were deficient in these aspects. During the training program and at the post-training evaluation, the facilitators need to ensure that the trainees learn to perform these steps correctly.

Adherence to appropriate infection control practices needs to be monitored and ensured for the safety of both the clients and the health care staff. We observed that the providers ignored some of the basic infection control procedures, like hand washing before and after the procedure. Low compliance with hand hygiene has been reported also in other health program contexts (Karabey et al., 2002; Sacar et al., 2006; Erasmus University Rotterdam, 2012) and is one of the major problems in limited-resource countries (Alp et al., 2011; Borg 2010). Hand hygiene compliance can be improved by training the health care workers on appropriate hand hygiene, distributing alcohol rub dispensers, and displaying posters depicting hand washing techniques at the center (Yilmaz et al., 2007; Anita et al., 2012).

Comparing data between settings demonstrated that some steps were performed better in rural areas than in urban area. These differences could be explained by the fact that the staff members in rural areas are usually young nurses and GPs who have recently graduated. We suppose that the young people integrate the instructions better and respect the guidelines more. As rural centers have lower workloads and are better equipped, especially those that were recently built or renovated, we suppose that these conditions allowed the providers to perform to better standards. The demonstrated differences between provider profiles could be explained by the lack of involvement of GPs in the program. Midwives/nurses perform the VIA test regularly and are therefore more successful in performing VIA.

However, these observations seem not affecting the satisfaction of women regarding the VIA service received at the health centers; the majority of women (98.6 %) were satisfied (Selmouni et al., 2015). Compliance with the VIA skills checklist was also biased by the nature of some of the questions, particularly those related to the sexual behavior of women or their husbands; it was difficult to ask such questions and obtain answers in the context of this study, and the usefulness of these questions should be reviewed by the local managers of the program.

The gaps and deficiencies identified by our study will be very useful to make the training program in Morocco more effective by addressing these specific issues. The perspectives of the providers elicited through the FGDs identified some issues that explain the results found previously and are pertinent in the contexts of both training and program management. Periodic refresher training and post-training in-service mentoring are key elements to ensure that the trained providers can perform VIA correctly and confidently.

The main limitation of this study was that the opportunity was missed to verify the provider's VIA diagnosis and case management decisions through independent co-assessment for each provider. The supervisory team concentrated only on the process of performing the screening tests that was mandated by

the Ministry of Health. The VIA positivity rate of 15% observed in our study is on the higher side for Morocco, where cervical cancer incidence is moderately high and HIV positivity in the population is low (Association Lalla Salma de Lutte contre le Cancer 2012). It is also necessary to evaluate the accuracy of VIA being performed by the GPs, nurses, and midwives. In this paper, we studied some of the determinants of compliance, particularly setting and profile. It would be useful also to compare the VIA provider's performance according to the age and years of experience of the providers. This study was conducted in only one region of Morocco. However, the generalization of these research findings would be acceptable because we believe that the practices in others regions would be similar.

Such evaluations should be continued on a regular basis in all provinces as part of a robust quality assurance protocol. A supportive supervisory plan should be drawn up not only to identify deficiencies but also to provide guidance and training to correct them in the providers.

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