

Evaluation of a Service Provider Short Course for Prevention of Fetal Alcohol Syndrome*

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ABSTRACT. Objective: South Africa has among the highest reported rates of Fetal Alcohol Syndrome (FAS) globally. Primary prevention targeting women at risk for alcohol-exposed pregnancies could substantially reduce the incidence of FAS. We evaluated the effectiveness of a short training intervention to improve service providers' screening, identification, and management of women at risk for alcohol-exposed pregnancies. **Method:** Training to screen and counsel women at risk for alcohol-exposed pregnancies was offered to 86 service providers (95% of whom were female) in two municipalities in the Western Cape Province, South Africa. Effectiveness was evaluated through a before–after study of service providers' knowledge and confidence levels and a comparison of service providers' practices (assessed indirectly via service user exit interviews) at intervention and control clinics. **Results:** The proportion of service providers indicating that alcohol use during pregnancy is

harmful to the fetus increased after training (23% vs. 67%; $p < .001$). After training, providers expressed significantly more confidence for four skills indicators related to the identification and management of women at risk for an alcohol-exposed pregnancy. Female clients at intervention clinics were more likely than those at the control clinics to receive alcohol advice (odds ratio [OR] = 2.13, 95% CI [1.27, 3.53]), counseling (OR = 1.3, 95% CI [1.05, 1.56]), and an offer of family planning (OR = 1.1, 95% CI [1.06, 2.10]) after the training. Time \times Group interaction variable analysis in multiple logistic regression modeling confirmed these effects as related to training. **Conclusions:** A short training course based on brief motivational interviewing principles appears to be effective in building service provider capacity to better prevent and manage women at risk for alcohol-exposed pregnancies. (*J. Stud. Alcohol Drugs*, 72, 530–535, 2011)

PRENATAL ALCOHOL EXPOSURE can result in a continuum of effects, including growth deficits, dysmorphology, and behavioral and cognitive difficulties over a lifespan (Premji et al., 2007). The most extreme form of the condition, known as Fetal Alcohol Syndrome (FAS), is one of the leading causes of preventable mental and physical impairment among infants globally (Centers for Disease Control and Prevention, 2003). Areas in the Western Cape Province of South Africa have among the highest reported prevalence rates of FAS in the world, ranging between 68.0 and 89.2 per 1,000 children (May et al., 2007).

Although the payment of alcohol to farm workers as part of their conditions of service, known as the “dop” system, is no longer legal in South Africa, alcohol misuse is one of the major challenges facing health and social services in

the Western Cape (London et al., 1998). Regular and heavy drinking generated by this system may be one of the reasons for the particularly high prevalence of FAS in the Western Cape (May et al., 2000). Although no cost estimates are available for the lifetime cost per child with Fetal Alcohol Spectrum Disorders (FASDs) for South Africa, it is likely to be substantial because FAS contributes 18.1% of the overall alcohol-attributable burden of disease in South Africa, ranking third after alcohol use disorders and interpersonal violence (Schneider et al., 2007).

FAS can be prevented in two ways: if no alcohol is consumed during pregnancy or if there is no pregnancy at all. Risk of having a child with FAS is therefore captured in the concept of an alcohol-exposed pregnancy (AEP), defined as any pregnancy during which a woman drank any amount of alcohol at any time (Mengel et al., 2006). The majority of women do not realize they have conceived until they are about 4–6 weeks into gestation (Floyd et al., 1999), which is a critical period for organogenesis (Brent and Beckman, 1990; Diav-Citrin and Koren, 2000). By this stage, consumption of alcohol may already have caused damage to the fetal neurological development and growth. Therefore, contraception is as important as alcohol abstinence in the prevention of AEPs.

Recognition of risk factors for, and prevention of, FAS requires informed and educated healthcare providers (Floyd et al., 2005). Whereas the focus of much FAS prevention

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concentrates on antenatal care, Summers and Price (1993) point out the importance of preconception intervention and thorough screening of women of reproductive age. Primary prevention targeting women at risk for AEPs could lead to measurable reductions in the incidence of FAS (Mengel et al., 2006). In South Africa, the development of an extensive network of free and accessible primary care clinics over the last decade could provide a strong base for implementing such AEP prevention.

This study evaluated the effectiveness of a short training intervention aimed at improving screening for and management of AEPs among service providers by describing the effect of training on service providers' knowledge and practice.

Method

Ethics approval for the study was acquired from the University of Cape Town Research Ethics Committee in May 2007 (REC ref 180/2007).

Study setting

The study was conducted in the West Coast–Winelands district of the Western Cape Province in South Africa, which is known for its high rate of AEPs. The area is highly agricultural, comprising large commercial farms and a number of small towns. Two municipalities, the Swartland and Bergrivier municipalities, were the intervention sites, and another, Cederberg municipality, served as the control site. This selection was intended to prevent contamination of information because the two intervention sites are in proximity to each other but quite distant from the control site. All three sites are of similar socioeconomic and demographic profile (Provincial government of the Western Cape, 2006).

Intervention

A structured 1-day interactive training program was designed to enable participants to adopt empathetic attitudes towards people with alcohol problems, develop skills to identify women at risk for an AEP, and facilitate both a reduction in alcohol intake and uptake of effective family planning. The participants were taught by counseling professionals specializing in substance use disorder treatment to use standard alcohol screening tools and were instructed regarding the importance of brief motivational interviewing and its role in the treatment of alcohol problems. Brief intervention refers to short, one-on-one counseling sessions that focus on changing patient behavior and increasing patient compliance to therapy (Fleming and Manwell, 1999), which can reduce the risk of AEPs (Ingersoll et al., 2003; Velasquez et al., 2010). The training also included discussion on the importance of contraception, alcohol abstinence, or both for AEP prevention; attitudes towards

women with alcohol problems; and ways to improve the referral system. The emphasis was on empowering providers to be more reflective of their own attitudes and practices, to identify what strategies they can meaningfully include in their routine practice, and to use the techniques of motivational interviewing to achieve better outcomes. To cope with the numbers of trainees and their schedules, two training opportunities were offered, one in May and the other in July/August, 2008. Social service providers and public sector healthcare workers comprised the majority of participants in the May and July/August training sessions, respectively. To ensure continuity of services at the healthcare centers, the July/August training participants were subdivided into three groups, with each group comprising about 20 participants. A manual consisting of basic concepts on alcohol use and screening and counseling tools was developed and provided to each participant. The manual is available and is freely accessible online (<http://research.newsbeat.co.za/projects/FAS.html>).

Study design, instruments, and analysis

We conducted two sub-studies: a knowledge, beliefs, and confidence assessment among service providers and a service user survey to assess service provider practices. Both sub-studies used structured questionnaires for data collection, available in both main local languages (English and Afrikaans).

Service provider sub-study. A before–after study design was used in which service providers completed questionnaires both before and immediately after the training session. The sample comprised all nurses, counselors, health promoters, and home-based caregivers in the intervention and control areas. Additionally, in the intervention area, all social workers were invited to participate in the training. A planned controlled study with before–after assessments in both the intervention and control sites could not be implemented because of delays in the training; as a result, an after study could not be included for the controls.

Data were collected on respondents' knowledge of behaviors known to be hazardous for pregnant women (smoking, alcohol use), those regarded as beneficial (exercise), and those neither harmful nor beneficial (consumption of red meat). The latter two questions served as "dummy" questions to assess respondent bias. Two alcohol questions were probed: one on the general harmfulness of alcohol in pregnancy and one specifically on alcohol as a cause of FAS.

Participants were asked to score on a scale of 1–4 (1 = *not confident at all* and 4 = *very confident*) how confident they were of identifying and managing a woman at risk for an AEP regarding (a) screening for alcohol consumption, (b) knowing where to refer, and (c) counseling women on the importance of alcohol abstinence if she is not on contraception.

Service user sub-study. This sub-study involved a survey of women of reproductive age (18–45 years) receiving services (“users”) from clinics where service providers underwent training compared with women attending control clinics. Service users’ reports were used to assess change in service providers’ practices following training. A systematic sample was selected that consisted of every third woman leaving each facility. Each participant was interviewed to determine whether the provider had asked her about her alcohol consumption and her contraceptive use and had given counseling in this regard. She was also asked her reason for the clinic visit, because attendance for antenatal care would, by definition, preclude questions about contraception. As part of informed consent, the women were assured that their participation would not affect their future care. Surveys were conducted before and after the training in both intervention and control clinics. Interviewers (who were unaware of which clinics received the intervention and which were controls) underwent training before data collection to standardize the interview process. Along with the use of a structured questionnaire, this helped to reduce interviewer bias.

Statistical analyses

For the provider sub-study, because there was only one set of data for the controls, we compared post-intervention with pre-intervention data in the intervention site and post-intervention data for health care workers in the intervention site with data from the control site in a cross-sectional manner. We used the Wilcoxon signed-ranks test, a nonparametric test used to compare medians of a paired sample, to compare the levels of confidence of the service providers before and after training. Stratified comparisons were conducted for the May (social workers) and July/August (health care workers) groups as well as for the two groups combined. To compare post-intervention with control findings, we used chi-square statistics to examine any possible associations.

TABLE 1. Demographics of service providers in training study

Variable	May training (<i>n</i> = 26)	July/August training (<i>n</i> = 60)	Control healthcare workers (<i>n</i> = 23)	<i>p</i>
Female, %	92.3%	96.7%	100%	.35
Age, years, <i>M</i> (<i>SD</i>)	41.7 (11)	44.8 (8)	45.0 (9)	.42

For the service user survey, multivariate logistic regression analysis was conducted to determine predictors of the practices of service providers. Because different users were interviewed before and after the intervention, we generated variables for the interaction between time (post- vs. pre-training) and group (intervention vs. control) to capture the training effect across groups. The interaction variables measured the outcome of interest at different levels of a predictor variable. Regression models were generated for each of the following outcome variables: (a) asked if alcohol was consumed, (b) family planning counseling given, and (c) advice given on dangers of alcohol consumption during pregnancy. Independent variables in each model included the purpose of clinic visit, group, time, and the Time × Group interaction variables. Stata 10 (StataCorp LP, College Station, TX) was used for all analyses.

Results

Service providers sub-study

Service providers: Comparing pre- and post-training scores. Of eligible participants in the intervention areas, 90% of the healthcare staff and 80% of the staff from nongovernmental organizations received training. The baseline demographics of the training participants (*n* = 86) and controls (*n* = 23) were similar. There were no significant differences in age and gender (Table 1) between the groups trained in May and in July/August. The former group consisted mainly of staff from social services (85%), whereas the latter was entirely healthcare workers, mainly nurses (70%).

TABLE 2. Pre- and post-training median confidence scores for May and July/August trainings

Variable	May training (<i>n</i> = 26) <i>Mdn</i> (range)			July/Aug training (<i>n</i> = 60) <i>Mdn</i> (range)		
	Pre	Post	<i>p</i> ^a	Pre	Post	<i>p</i> ^a
Identifying a woman with/at risk for AEP	2 (1–4)	3 (2–4)	.000	2 (1–3)	4 (3–4)	.000
Knowledge of where to refer a woman at risk for an AEP	2 (1–4)	4 (2–4)	.000	2 (1–3)	4 (3–4)	.000
Routine alcohol screening in women of reproductive age	2 (1–4)	4 (2–4)	.000	2 (1–3)	4 (3–4)	.000
Advising on alcohol abstinence versus family planning	2 (1–3)	3 (2–4)	.000	2 (1–3)	4 (3–4)	.000

Notes: AEP = alcohol-exposed pregnancy. ^aSigned-ranks test comparing medians participants pre- and post-intervention.

TABLE 3. Comparison of health worker behavior reported by service users pre- and post-intervention

Service provider practice	%	Pre-training %	Post-training OR	<i>p</i>	[95% CI]
Advice on pregnancy care	44	56	1.53	.01	[1.19, 3.82]
Advice on effects of alcohol consumption during pregnancy	28	72	2.13	.01	[1.27, 3.53]
Counseled on family planning	46	54	1.30	.04	[1.05, 1.56]
Offered family planning	45	55	1.10	.02	[1.06, 2.10]

Notes: OR = odds ratio; CI = confidence interval

Post- versus pre-training. Analysis of the combined responses of service providers from both the May and July/August training sessions showed a small but statistically significant increase after the training in the percentage of respondents who said that alcohol causes fetal harm compared with before the training (100% vs. 95%, respectively, *p* = .04). There were no significant changes in knowledge of the effects on the fetus of other behavioral factors (e.g., smoking, red meat consumption, and exercise) for the combined group. The ability of service providers to link consumption of alcohol during pregnancy specifically to FAS increased for both subgroups following training (May training from 19% to 46%, *p* = .06; July/August training from 25% to 77%, *p* < .001) and for the combined sample (from 23% to 67%, *p* < .001).

Overall, participants reported significantly higher confidence scores for managing women at risk for AEPs after the training than before the training in both groups and for all four skills probed (Table 2).

Service providers: Comparing intervention (post-training) and control sites. Compared with controls, a significantly greater proportion of trained health care service providers reported alcohol as a cause of harm to an unborn baby (100% vs. 69.6%, *p* < .01) and reported alcohol specifically as causal for FAS (77% vs. 48%, *p* < .001). Confidence scores among health care service providers in the intervention site after training were significantly higher than those in the control site for all skills and knowledge questions (*p* < .01).

Service users' exit interviews

In total, 375 women leaving the clinics were interviewed: 284 (120 pre- and 164 post-training) in the intervention site clinics and 91 (31 pre- and 60 post-training) in the control site clinics. The overall mean age at baseline was 28.8 years. Mean ages of women in the intervention and control sites were not significantly different, nor were there significant differences in the purpose of the clinic visits between the two sites at baseline. However, at the post-intervention visit, women attending the intervention site clinics were more likely to visit for family planning and well baby services and less likely to be visiting for antenatal care and primary health care services (*p* = .02)

After training, significantly more service users in the intervention sites than in the control site (87.9% vs. 26.1%, *p* = .02) reported receiving counseling on the adverse effects of alcohol on the fetus from the healthcare providers. Also, significantly more women in the intervention sites were counseled, offered family planning, and given general advice on pregnancy care (91.2% vs. 25.8%, *p* = .01). Table 3 confirms a beneficial effect from training on the following service provider practices: family planning (both counseling and the offer of contraception) and advising clients on pregnancy care, and on the dangers of alcohol consumption during pregnancy.

To separate the effect of training from group or time, an interaction variable for Time × Group effects was modeled in a multivariate regression, controlling for reason for visiting the clinic. Training appears to have a significantly positive impact on family planning counseling (odds ratio [OR] = 1.24, 95% CI [1.11, 3.77]), offer of family planning (OR = 2.54, 95% CI [1.69, 9.31]), pregnancy advice (OR =

TABLE 4. Comparison of provider behavior reported by service users on exit interviews pre- and post-intervention (results of five multiple logistic regression analyses)

Variable	OR ^a	<i>p</i>	[95% CI]
Asked if take alcohol			
Post versus pre in control group	0.49	.16	[0.18, 1.34]
Post versus pre in intervention group	0.42	.20	[0.32, 1.21]
Time × Group interaction	1.15	.50	[0.17, 1.03]
Family planning counseling			
Post versus pre in control group	0.56	.17	[0.34, 1.93]
Post versus pre in intervention group	1.30	.04	[1.05, 1.56]
Time × Group interaction	1.24	.03	[1.11, 3.77]
Family planning offered			
Post versus pre in control group	0.58	.37	[0.34, 1.99]
Post versus pre in intervention group	1.10	.02	[1.06, 2.10]
Time × Group interaction	2.54	.04	[1.69, 9.31]
Advice: do's and don'ts during pregnancy			
Time effect in control group	1.03	.10	[0.04, 1.35]
Time effect in intervention group	1.53	.01	[1.19, 3.82]
Time × Group interaction	2.89	.03	[1.27, 11.88]
Advice: effects of maternal alcohol consumption on an unborn baby			
Time effect in control group	0.42	.09	[0.15, 1.16]
Time effect in intervention group	2.13	.01	[1.27, 3.53]
Time × Group interaction	5.07	.03	[1.37, 6.96]

Notes: OR = odds ratio; CI = confidence interval. ^aMultivariate logistic regression controlled for reason for visiting clinic.

2.89, 95% CI [1.27, 11.88]), and pregnancy advice specific to alcohol consumption (OR = 5.07, 95% CI [1.37, 6.96]) (Table 4).

Discussion

This is the first study to evaluate the effectiveness of a service provider training program to address prevention of AEPs in South Africa. Our results support the argument that a short training intervention can improve service providers' practices with regard to prevention of AEPs (Mengel et al., 2006). It is important that service providers are empowered to prevent AEPs and manage women at risk for them, particularly in high-prevalence settings such as South Africa. The potential value of such interventions is illustrated by the fact that only a minority of the female users attending primary healthcare services (in both the intervention and the control sites) reported at baseline being asked if they drank alcohol.

The training appeared to show benefits (on bivariate comparisons) in improving knowledge of prenatal alcohol exposure as harmful to the fetus and its specific link to FAS. This was borne out in the service users' exit interviews at health facilities, where there was a very strong effect for the outcome measure "pregnancy advice" specific to alcohol consumption. That almost all health care service providers reported alcohol to be harmful is not surprising given the high prevalence of alcohol misuse in the study area (Morojele et al., 2010), which would have increased respondents' awareness about alcohol-related risks. The high awareness may also explain why there was a nonsignificant decrease in the odds of women reporting being asked if they drank alcohol after the training in the intervention site (OR = 0.42, 95% CI [0.32, 1.21]), because providers may have allowed a perception of high population prevalence of drinking to induce them to concentrate on the advice rather than the screening.

Despite this, the training was still able to significantly increase awareness among health care service providers of the specific link of alcohol to FAS. It was also strongly evident among social workers undergoing the intervention, whose pre-intervention knowledge of alcohol as a cause for FAS increased from 19% to 46%, almost approximating the levels reflected by health care workers in the control site.

The service providers' reported confidence in managing women at risk for AEPs increased after the training for all four measures of skill. These results suggest that even though service providers in this area initially had some knowledge about FAS and alcohol-related hazards, they were not confident about the identification and management of women at risk for AEPs. The training's apparent success in increasing confidence to manage such cases is consistent with significantly higher confidence levels of trained service providers versus controls, who had similar median confi-

dence scores to intervention respondents at baseline. Nonetheless, cross-sectional comparisons are vulnerable to bias, which cannot be excluded in our study. For example, the higher awareness of maternal alcohol consumption as a risk to the fetus in the intervention site at baseline (95%) compared with controls (70%) may reflect differences between the two settings, with higher pre-existing awareness levels in the intervention site. However, service providers in the control site were not significantly different in age, gender, type of work, and type of patient populations, and the change in awareness and confidence among trained participants, from already potentially higher levels than controls, appears to suggest that these were real changes not attributable to confounding.

The strongest evidence from this study arises from the service user survey. Multivariate analyses confirmed a beneficial effect of training on provider practices as measured through exit interviews with female clients at control and intervention clinics. Controlling for their reason for visiting the clinic, women using services where staff had been trained were significantly more likely than controls to be counseled on contraception, offered family planning, given pregnancy counseling, and given advice on the effects of maternal alcohol consumption on an unborn baby.

We are unaware of any published literature specific to short training intervention for pre-conception prevention of AEPs. Existing literature relating to FAS prevention through service provider training has been mainly in the arena of affected children (Elgen et al., 2007) and in identifying pregnant women who are at risk for bearing children with FAS (Chang, 2001), a prevention endpoint much later in the pathway to FAS than that targeted by this study (i.e., risk of an AEP). Although focused on upstream prevention of FAS by identifying risk of AEPs in nonpregnant women, our results are consistent with those found by others (Chang, 2001; Elgen et al., 2007). Elgen and colleagues (2007) found that an information program aimed at healthcare workers was effective in increasing FAS/FASD detection. Chang and colleagues (2001) tested different alcohol screening instruments among pregnant women and concluded that finding a positive screen provides an opportunity for the clinician to discuss prenatal alcohol exposure, which is a starting point to combat the situation. Going beyond Chang's (2001) recommendation to screen pregnant women for alcohol consumption, these findings support the need for alcohol screening in all women of reproductive age who seek any healthcare services. Screening a pregnant woman for alcohol use may already be too late to prevent FAS.

One limitation of the study is that the service provider sub-study used a before-after design, and confounding is hard to rule out. Although a randomized controlled trial would have been the optimal design to demonstrate benefit, one of the challenges in operational health service-based research is logistic limitations imposed by day-to-day service

delivery obligations, which interfere with careful design (Theobald et al., 2009). Even in the case of a nonrandomized experimental design intended for the provider training, we had to make do with a control site that could only be surveyed once, as a result of logistical problems. Nonetheless, the consistency of the findings of the two different sub-studies, both internally and across the studies, is reassuring.

Another limitation of the study was that the post-intervention assessment was done immediately after the training. We had planned booster training sessions for 3 months after the training, which could have assessed service providers' retention of knowledge, but they were not possible because of staff shortages. We are therefore unclear about the retention of knowledge and skills acquired during the training. Sustainability of skills and knowledge would need to be verified before a policy in this regard is implemented. Future training for workers in understaffed settings could involve short in-service refresher training at the healthcare and social services' workplace.

In summary, participants who underwent the training reported improved knowledge of alcohol risks for FAS and greater confidence in identifying and managing women at risk for AEPs after the training in comparison with baseline, as well as in comparison with controls. The effects of the training were similar for both social service and health care provider groups, and the reported increased confidence in skills among health workers appeared to be confirmed in a sub-study of client exit interviews. The study suggests that training service providers to screen women during routine primary healthcare to determine their risk of having AEPs and to provide appropriate management could be an important intervention for reducing the risk of FAS.

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