Comparisons of Reported Sexual Behaviors from A Retrospective Survey Versus a Prospective Diary in the Botswana Defence Force

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COMPARISONS OF REPORTED SEXUAL BEHAVIORS FROM A RETROSPECTIVE SURVEY VERSUS A PROSPECTIVE DIARY IN THE BOTSWANA DEFENCE FORCE

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This study compares self-reported sexual behaviors from a retrospective survey and a prospective diary among Botswana Defence Force (BDF) personnel. One hundred sixty-one male participants, aged 18–30, completed two weekly prospective diaries and a retrospective survey querying them about behaviors reported during the same time frame as the diaries. Most reported behaviors were similar between the two data collection methods. However, there was low agreement for reporting sex with a spouse and exchanging material goods for sex with a casual partner; frequency of sex and condom use rates (CURs) among married participants also differed.

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When comparing survey condom use frequencies to diary CURs, the level of agreement diminished from the always to occasionally condom use categories. Inconsistencies in reporting may be due to the frequency of the sexual behavior, question sensitivity, the data collection setting, and the interpretation of response categories. Further research is needed to improve accurate reporting of sexual behaviors.

INTRODUCTION

Assessments of sexual behaviors (i.e., sexual activity and condom use) rely heavily on self-report. Diaries are typically considered the closest approximation to a gold standard when measuring sexual behaviors (Graham, Catania, Brand, Duong, & Canchola, 2003; Schroder, Carey, & Vanable, 2003), and are used in diverse settings (Allen et al., 2003; Gillmore, Leigh, Hoppe, & Morrison, 2010; Voeten, Egesah, Varkevisser, & Habbema, 2007) to reduce the chances of recall bias (Catania, Gibson, Chitwood, & Coates, 1990; McLaws, Oldenburg, Ross, & Cooper, 1990; Weinhardt, Forsyth, Carey, Jaworski, & Durant, 1998). However, maintaining a diary requires strong participant commitment (Weinhardt et al., 1998), and some may not complete the diary according to protocol (e.g., daily), possibly introducing recall bias. Respondents may also become more aware of their own behaviors as a result of regular reporting (i.e., reactivity; Reading, 1983), which may lead to changes in sexual behaviors or the reporting of these behaviors over time.

An alternative to the diary is the self-completed retrospective survey (Boekeloo et al., 1994; Durant & Carey, 2000; Saltzman, Stoddard, McCusker, Moon, & Mayer, 1987). Advantages include low cost and the ability to administer it to large groups. In comparison with face-to-face interviews, participants may feel less threatened about reporting their sexual behaviors in a self-administered survey (Catania, McDermott, & Pollack, 1986), which may result in more accurate data. However, the major drawback is the possibility of recall bias. Individuals differ in their ability to remember past events, and accurate reports of sexual behaviors may be influenced by the length of the recall period (Graham et al., 2003), use of memory tools, as well as the frequency of the behavior being assessed (Catania et al., 1990; Schroder et al., 2003). Other limitations include having participants group their usual or average behaviors into one category, which may not reflect irregular or infrequent behaviors (Leigh, Gillmore, & Morrison, 1998).

Studies comparing reported sexual behaviors from a retrospective survey to a prospective diary have found both under- (McAuliffe, DiFranceisco, & Reed, 2007; Ramjee, Weber, & Morar, 1999) and over-reporting (Coxon, 1999; Leigh et al., 1998) of behaviors, with no obvious trend in either direction (Schroder et al., 2003). Observed differences may be explained by the time frame in which the survey was administered following diary completion and the frequency of the sexual behavior examined. Infrequent behaviors may be more easily remembered (McLaws et al., 1990) and recalled more accurately than frequent behaviors (Coxon, 1999). Recall error has been shown to increase with more frequent sexual behaviors (Downey, Ryan, & Kulich, 1995). Other reasons explaining the discrepancies include the content of the data collection tools, variations in the interpretation of the content by participants (Hoppe et al., 2008), and the use of different study populations.

To our knowledge, comparisons of reported sexual behaviors between the diary and retrospective survey have not been previously explored among military person-

nel. Findings may be used to guide the selection of appropriate data collection methods for this population. The current paper compares reports of sexual activity and condom use behaviors from a retrospective survey and a prospective diary among Botswana Defence Force (BDF) military personnel.

METHODS

STUDY DESIGN AND PARTICIPANTS

From October 2010 to April 2011, a nonrandomized intervention study was conducted to examine the effects of condom-wrapper graphics and scent on condom use in the BDF. Results from the baseline survey are previously reported (Tran et al., 2013). The findings of this paper are drawn from follow-up data. Participants were male BDF personnel who had ever had sex, were aged 18–30 years, and were stationed at one of four selected military bases. Participants were recruited through flyers, command newsletters, and standard military communication channels. Interested personnel attended an informational briefing where the study purpose and procedures were explained. A total of 211 men (81.2%), of a target sample size of 260, provided written informed consent. This study was approved by institutional review boards in the United States (Naval Health Research Center and San Diego State University, San Diego, California) and Botswana (Ministry of Health, Gaborone, Botswana).

STUDY PROCEDURES

Study personnel briefed interested individuals on the procedures and conducted the written informed consent process. Consented participants provided their contact information, were assigned a unique study identification number, and completed a baseline survey that collected demographics and HIV risk behaviors. Participants then attended a training session on how to complete the sexual behavior diary. Each diary was a bound booklet that was linked to the participant via the study identification number. Detailed instructions, sexual behavior terminology, definitions for the different sexual partner types, and an example of how to complete an entry were included in the diary.

Four diaries were distributed during the study: two measured pre-intervention sexual behaviors and two measured post-intervention behaviors; only data from post-intervention diaries were analyzed in this study. Participants were contacted by study personnel reminding them to return each diary in person after each week of completion. At the final study visit, participants returned their last diary and completed a retrospective survey, which queried them about their sexual activity and condom use behaviors reported in the same two-week time frame as the post-intervention diaries.

The survey was administered in a group setting, with participants sitting far enough apart to maintain privacy. To reduce individual interpretation of the survey items, the questions and response choices were read aloud by a trained survey administrator while participants followed along and marked their responses on their surveys. A calendar was provided as a memory aid to help participants anchor dates during the reporting period. Following survey completion, several randomly selected participants (n = 80) were invited to attend focus group sessions, which included discussions regarding sexual behavior reporting in the survey and diary.

Of the 211 consented participants, 31 (14.7%) did not have a completed retrospective survey because they had either withdrawn from the study (i.e., informed study personnel they no longer wished to participate; $n = 10$), were lost to follow-up (i.e., unreachable by study personnel for follow-up visits; $n = 17$), or attended the final visit but left the survey blank ($n = 4$). A bias analysis comparing the demographics and military background of these participants and those who completed the retrospective survey was performed. Those who did not complete the retrospective survey were more likely to be from the support unit than other military units. A comparison of sexual and condom use behaviors between the different military units was performed, yielding no significant differences. One hundred sixty-four (77.7%) participants completed post-intervention diaries and the retrospective survey. Of these, 3 were excluded because the survey was administered prior to the completion of the diaries. Analyses were performed on the remaining 161 participants.

MEASURES

Sexual Behavior Diary. Participants were instructed to complete the diary on a daily basis. To address the possibility of Hawthorne's effect (i.e., modifying one's behaviors because of observation), participants were requested to not modify their typical sexual behaviors while participating in the study. For each day of the 1-week diary, participants provided the date and specified (yes or no) whether they had sex (defined as vaginal or anal intercourse). If participants did not have sex, they indicated this in the diary. If participants did have sex, they were asked to report the number of times they engaged in sexual intercourse. Participants could record up to three sexual events that occurred each day. For each sexual event, participants indicated the type of sexual partner by checking a box for spouse, regular cohabitating, regular noncohabitating, or casual partner. Condom use for each sexual event was measured as yes or no. For those reporting sex with a casual partner, they were asked to specify (yes or no) whether any material goods (e.g., gifts, money) were exchanged for sex.

Retrospective Survey. Participants were instructed to answer the survey questions corresponding to the same time period in which they completed the two post-intervention diaries. The survey included items about the number of days (during the previous 2 weeks) the participant engaged in sex, the types of sexual partners, and the frequency of sex and condom use for each partner type. For those who reported having sex with a casual partner, they were asked to specify if they had exchanged any materials goods for sex (yes or no). Participants were also asked to indicate how often (always, most times, occasionally, never) they used a condom during sex.

STATISTICAL ANALYSIS

A condom use rate (CUR) was computed for each type of sexual partner and defined as the frequency of protected sex (i.e., use of a condom) divided by the total frequency of sex, over 2 weeks. An overall CUR was calculated for each participant in a similar fashion, and defined as the sum of all protected sex divided by the sum of all sex. For ease of interpretation, CURs were expressed as percentages and ranged from 0 to 100%. Thirty-two participants reported in the survey using a greater number of condoms than the total number of times they had sex, resulting in a CUR > 100%. There are several reasons why this may have happened including replacing a broken condom, using more than one condom simultaneously (e.g., double bag-

ging; Morineau, Prybylski, Song, Natpratan, & Neilsen, 2007; Wolitski, Halkitis, Parsons, & Gomez, 2001), or reporting having sex once while in fact they had intercourse more than once during a sexual encounter. Most of these participants were young (mean age = 25.2 years), educated, and single (90.6%). Since the literature has shown CURs to be higher among men with these particular characteristics (Kapiga & Lugalla, 2003; Mnyika, Klepp, Kvale, & Ole-Kingori, 1997), a CUR of 100% was assigned. Separate analyses were performed excluding these 32 participants.

Descriptive statistics were computed, including frequencies and percentages for categorical variables and means and standard deviations (*SD*s) for continuous variables. Cohen's kappa statistic (κ) for categorical variables and Pearson's correlation coefficient (*r*) for continuous variables were used to examine the level of agreement in reports of sexual behaviors between the survey and diary. Corresponding 95% confidence intervals (*CI*s) were also presented. The agreement and interpretation of κ was based on a scale developed previously; $\kappa < 0$ = less than chance, 0.01–0.20 = slight, 0.21–0.40 = fair, 0.41–0.60 = moderate, 0.61–0.80 = substantial, 0.81–0.99 = almost perfect (Landis & Koch, 1977). McNemar's test was used to examine the presence of over- or under-reporting of dichotomous variables (e.g., reported sex with a spouse; yes vs. no) between the diary and survey by testing the difference between two correlated proportions. For continuous variables, means and *SD*s were reported for the survey and diary. The difference between the two means, calculated by subtracting a respondent's estimate in the survey from the corresponding count derived from the diary, was presented, along with 95% CIs. If the mean difference was zero, the diary and survey estimates were the same. If the mean difference was negative, the survey estimate was higher; if the difference was positive, the diary count was higher. If 0 was contained within the 95% CI of the mean difference, it was concluded there was no significant difference between the survey and diary. Data were analyzed using SAS statistical software version 9.3 (SAS Institute, Cary, NC, USA). All tests were two-tailed, with $p < 0.05$ considered statistically significant.

RESULTS

Demographic characteristics are presented in Table 1. The mean age was 25.3 years (*SD* = 2.4; range = 21–30). Most participants were single, never married (82.6%), had completed junior or senior secondary school (equivalent to high school) (72.7%), and of Christian faith (82.6%). The majority were ranked Private (48.5%) or Junior Noncommissioned Officers (46.0%), and in the Fighting (34.8%) or Logistics unit (37.3%). The mean length of military service was 4.2 years (*SD* = 2.4; range = 1–13).

The measure of agreement between the two data collection modalities (i.e., diary and survey) for reported types of sexual partners and the exchange of material goods for sex with a casual partner is shown in Table 2. Regarding sex with a spouse, although the modalities agreed 93.2% of the time, they would be have been expected to have a similar level of agreement by chance alone (88.8%), suggesting a fair agreement ($\kappa = 0.39$). For reports of having sex with a regular cohabitating partner, 86.9% of the data corresponded, which was much higher than the expected level of agreement by chance alone (50.9%), suggesting substantial agreement ($\kappa = 0.73$). Similar substantial agreements were observed for reports of sex with a regular noncohabitating partner ($\kappa = 0.66$) and a casual partner ($\kappa = 0.68$). Regarding the exchange of material goods for sex with a casual partner, only 67.8% of the

TABLE 1. Demographic Characteristics of Study Participants (N = 161)

Variable	*n*	%
Marital Status		
Single, Never Married	133	82.6
Married/Cohabitating	28	17.4
Education		
Junior/Senior Secondary	117	72.7
Tertiary	37	23.0
Vocational	7	4.4
Religion		
Christian	133	82.6
Other Non-Christian	15	9.3
No Religious Affiliation	13	8.1
Military Rank		
Private	78	48.5
Junior NCO	74	46.0
Junior Officer	9	5.6
Military Unit		
Fighting	56	34.8
Logistics	60	37.3
Support	45	28.0

Note. NCO, Noncommissioned Officer.

data agreed, which was similar to the expected level of agreement by chance alone (61.9%), suggesting a slight agreement ($\kappa = 0.16$).

The presence of over- and under-reporting of these variables is also presented in Table 2. Participants significantly under-reported having sex with a spouse in the survey compared with the diary (n = 6/161 vs. n = 13/161; p = 0.03), and over-reported having sex with a regular noncohabitating partner in the survey (n = 105/161 vs. n = 93/161; p = 0.02). Although not statistically significant, the exchange of material goods for sex with a casual partner was under-reported in the survey (n = 11/56 vs. n = 17/56; p = 0.16).

Comparisons of the total number of days (out of 2 weeks) that a participant engaged in sex and total frequency of sex are presented in Table 3. The mean number of days participants reported having sex in the survey (mean = 4.5, range = 0–12) was similar to the diary (mean = 4.3, range = 0–13); a moderate correlation was observed (r = 0.66). Similar findings were also observed for total frequency of sex (survey mean = 6.7, range = 0–34 vs. diary mean = 7.2, range = 0–39; r = 0.49). When frequency of sex was stratified by partner, similar trends were found for regular cohabitating, regular noncohabitating, or casual partners. However, estimates of frequency of sex with a spouse was slightly lower in the survey (mean = 2.3, range = 1–4) relative to the diary (mean = 4.3, range = 2–6). Although the mean difference was not significant, a weak correlation was observed (r = -0.05).

Table 3 also compares CURs between the survey and diary for those who reported having sex. Although estimates in the survey (mean = 92.3, range = 0–100) were slightly lower than those in the diary (mean = 94.7, range = 6.3–100), the mean difference was not statistically significant. Similar trends in condom use estimates were observed for regular cohabitating, regular noncohabitating, and casual partners. Among the three married participants, CURs were slightly higher in the survey (mean = 83.3, range = 50–100) than the diary (mean = 81.1, range = 60–100); however, the mean difference was not statistically significant. In analyses excluding

TABLE 2. Comparisons of Reported Partner Types and Exchange of Material Goods for Sex With a Casual Partner Between the Prospective Diary and Retrospective Survey (N = 161)

		Reported Types of Sexual Partners				
		Spouse	Regular Cohabitating	Regular Noncohabitating	Casual	Exchanged Material Goods for Sex With a Casual Partner[a]
Reported In		(N = 161)	(N = 161)	(N = 161)	(N = 161)	(N = 56)
Diary	Survey	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Yes	No	9 (5.6)	13 (8.1)	7 (4.3)	13 (8.1)	12 (21.4)
No	Yes	2 (1.2)	8 (5.0)	19 (11.8)	12 (7.5)	6 (10.7)
% Total disagreement		6.8	13.1	16.1	15.6	32.1
Yes	Yes	4 (2.5)	59 (36.6)	86 (53.4)	56 (34.8)	5 (8.9)
No	No	146 (90.7)	81 (50.3)	49 (30.4)	80 (49.7)	33 (58.9)
% Total agreement		93.2	86.9	83.8	84.5	67.8
Kappa		0.39	0.73	0.66	0.68	0.16
95% CI		[0.11, 0.67]	[0.63, 0.84]	[0.54, 0.78]	[0.57, 0.80]	[–0.11, 0.42]
p value		< 0.001	< 0.001	< 0.001	< 0.001	0.22
McNemar's statistic		4.45	1.19	5.54	0.04	2.00
p value		0.03	0.27	0.02	0.84	0.16

Note. CI, confidence interval. [a]Only includes those who reported having sex with a casual partner in both the diary and survey.

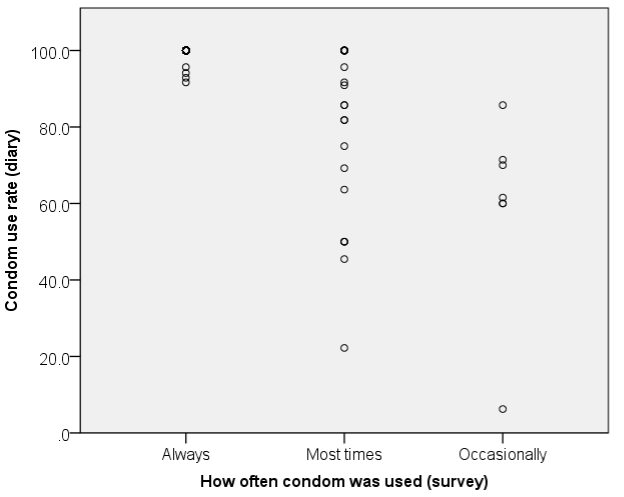

FIGURE 1. Comparison of Condom Use Frequency Reported in the Retrospective Survey Versus Condom Use Rate Calculated From the Prospective Diary (N = 147).

the 32 participants who reported a higher frequency of protected sex than total frequency of sex, similar results were observed (data not shown).

One hundred forty-seven participants provided a response for condom use frequency in the survey and had a corresponding CUR calculated from the diary. About 80% of participants (n = 117) reported always using condoms in the survey, 15.7% (n = 23) used condom most times, and 4.8% (n = 7) used condoms occasionally. No participants reported never using condoms (data not shown). Figure 1 shows the plot of retrospective condom use categories in relation to diary CURs. The most consistent responses observed between the modalities were found among those who reported always using condoms on the survey. CURs ranged from 91.7% to 100%. Among those who reported using condoms most times or occasionally, greater variability in the range of CURs was found (range $_{\text{most times}}$ = 22.2–100% and range $_{\text{occasionally}}$ = 6.3–85.7%).

Several themes about reporting sexual behaviors in the diary and survey emerged from the focus group sessions. Participants were asked whether they would be more truthful in reporting their behaviors in the diary or survey and which instrument they preferred. Although most reported that both would elicit truthful responses, the majority preferred the diary because of the ability to record their behaviors prospectively and in private. Furthermore, some participants reported that the diary allowed them to freely disclose when they paid for sex with a sex worker.

DISCUSSION

The diary was considered the gold standard in this study. Results show that most reports of sexual and condom use behaviors between the retrospective survey and prospective diary were similar, although notable differences were observed for some behaviors. For example, the level of agreement above chance between the modalities

TABLE 3. Comparisons of Sexual Activity and Condom Use Behaviors Reported in the Prospective Diary and Retrospective Survey (N = 161)

Variable		Diary		Survey							
	n	Mean	*SD*	Mean	*SD*	Mean Difference[b]	95% CI of Mean Difference	*p* Value	r of Survey and Diary	95% CI of r	*p* Value
Total Days (Out of 2 Weeks) Participant Engaged in Sex	160	4.29	2.56	4.53	2.69	–0.24	[–0.57, 0.10]	0.17	0.66	[0.57, 0.74]	< 0.001
Overall Frequency of Sex	158	7.19	5.75	6.71	5.42	0.48	[–0.41, 1.37]	0.29	0.49	[0.36, 0.60]	< 0.001
Frequency of Sex by Partner Type											
Spouse	3	4.33	2.08	2.33	1.53	2.00	[–4.57, 8.57]	0.32	–0.05	—[c]	0.97
Regular Cohabitating	56	5.13	4.16	5.34	5.00	–0.21	[–1.26, 0.83]	0.68	0.65	[0.47, 0.78]	< 0.001
Regular Noncohabitating	81	5.60	4.50	5.43	4.46	0.17	[–0.69, 1.04]	0.69	0.62	[0.47, 0.74]	< 0.001
Casual	55	3.85	2.48	3.29	2.35	0.56	[–0.08, 1.20]	0.08	0.52	[0.30, 0.69]	< 0.001
Overall Condom Use Rate[a]	143	94.69	14.93	92.31	18.21	2.37	[–0.62, 5.37]	0.12	0.42	[0.27, 0.54]	< 0.001
Condom Use Rate[a] by Partner Type											
Spouse	3	81.11	20.09	83.33	28.87	–2.22	[–35.69, 31.24]	0.80	0.91	—[c]	0.27
Regular Cohabitating	53	88.81	23.80	88.58	25.54	0.23	[–5.73, 6.19]	0.94	0.62	[0.42, 0.76]	< 0.001
Regular Noncohabitating	76	95.34	17.19	93.66	19.31	1.68	[–1.78, 5.14]	0.34	0.66	[0.51, 0.77]	< 0.001
Casual	53	98.74	9.16	97.48	14.40	1.26	[–2.76, 5.27]	0.53	0.30	[0.03, 0.53]	0.029

Note. CI, confidence interval; SD, standard deviation. [a]Percentage use rate among those who reported having sex. [b]Mean difference = diary estimate—survey estimate. [c]Due to small samples, the confidence interval was not computed.

for reports of sex with a spouse was relatively low, and married participants tended to under-report this behavior in the survey. Estimates of the total frequency of sex for married participants were also lower in the survey compared with the diary; however, CURs were higher in the survey than in the diary. Furthermore, a significantly higher proportion of participants reported having sex with a regular noncohabitating partner in the survey compared with the diary. These results suggest that recall error for the survey, in the form of over- and under-reporting, may be more prevalent for behaviors that occur more regularly or frequently. As shown in other studies, frequency of the sexual behavior may influence how accurately a participant will remember and report the act (Catania et al., 1990; Schroder et al., 2003). For example, Schroder et al. (2003) suggested that high-frequency events were less salient, which may cause people to forget these events more easily. Inaccurate reporting may be more typical among those who have a spouse or regular partner, since the sexual behaviors practiced in these forms of relationships may be more routine, less salient, and more easily forgettable. These results, however, are based on a small number of participants and therefore should be interpreted with caution. Further studies with larger sample sizes are needed.

A relatively low level of agreement was observed between the survey and diary regarding the exchange of material goods for sex with a casual partner. Although not statistically significant, this behavior was under-reported in the survey. The observed differences may be due to the sensitive nature of the question and the fact that participants may have felt uncomfortable reporting such a behavior (Tourangeau & Smith, 1996). Additionally, participants may have felt threatened by questions regarding behaviors that they deemed socially undesirable (Catania et al., 1990). The method of data collection could also influence disclosure (Bowling, 2005; Catania et al., 1990; Fenton, Johnson, McManus, & Erens, 2001; Schroder et al., 2003). Focus group data showed that participants preferred the diary because of the ability to complete it in private, suggesting that the setting of data collection could influence reporting behaviors. Participants may have felt more comfortable completing the diary in the privacy of their own home than they did completing the retrospective survey in a group setting. This may help explain the discrepancies observed between the diary and survey. Further research in this population is needed regarding reporting behaviors with different types of sexual practices and different modes of data assessment.

When comparing the total number of days a participant engaged in sex during the 2-week data collection period, estimates were nearly identical between the survey and diary. Additionally, the frequency of sex and CURs for nonspousal partners did not differ substantially between the two reporting methods. These findings may be partially explained by the fact that survey and diary questions were framed according to the different partner types, which may have assisted with the recall of past behaviors (McAuliffe et al., 2007). Other explanations include the provision of a calendar to participants during the survey administration and the use of concrete dates in the diary for the reporting period, which may have reduced recall errors (Weinhardt et al., 1998). Further, the short time frame in which the survey was administered relative to the diary and the actual completion of the prospective diary may have enhanced the participant's memory. Additional studies with longer recall periods (e.g., 3 or 6 months) are needed to accurately assess the effects of time.

Comparisons of retrospective condom use frequencies (i.e., always, most times, occasionally) from the survey to the corresponding diary CURs suggest that the

level of agreement between the two diminishes as we move further away from the always category. Among those who reported always using condoms on the survey, the CURs from the diary were relatively high. However, for those who reported occasionally using condoms, the level of disagreement was substantial, suggesting that the selected response may not reflect actual usage. Variability was also observed in the interpretation of the retrospective condom use categories, as shown in other studies (Cecil & Zimet, 1998; Hoppe et al., 2008; Jaccard, McDonald, Wan, Dittus, & Quinlan, 2002). Among participants who reported always using condoms on the survey, CURs from the diary ranged from 91.7% to 100%, suggesting that some did not interpret always as 100%. Cecil and Zimet (1998), noted that the term always or never may not be viewed as absolute, but rather as a range of behaviors. The greatest variability in the interpretation of the retrospective categories was observed among those who reported using condoms most times or occasionally. These inconsistencies may be a result of participants reporting typical condom use behaviors and not actual behaviors that were reported in the diaries. Other reasons include not providing a percentage range in the categories, consequently leaving each one open to interpretation. Adding verbal clarification (Cecil & Zimet, 1998) or incorporating percentiles into each response category (e.g., never = 0%; occasionally = 1–49%; most times = 50–99%; always = 100%) may improve the accuracy of condom use frequency data in a retrospective survey (Jaccard et al., 2002).

As with most sexual behavior research that relies on self-reported data, it is extremely difficult to determine the accuracy of the collected data. Some studies have used biological assessments to confirm self-reported condom use (Allen et al., 2003) and recent sexual activity (Minnis et al., 2009), while others have examined the reliability of self-reported sexual behaviors obtained from couples (de Boer et al., 1998; Lagarde, Enel, & Pison, 1995). However, biological measurements are not always feasible and may discourage participation, and recruiting couples to participate in studies poses numerous challenges. To reduce respondent bias, confidentiality measures were enforced to ensure privacy during survey administration and participants were informed that they could skip questions they felt uncomfortable answering. Further, no personal identifiers were collected from the surveys or diaries.

There are several limitations to this study. Although participants were instructed to complete the diary on a daily basis, it is possible that some may not have adhered to the study protocol; therefore, prospective data collection may have been compromised. However, participants only had to recall events that occurred, at most, 2 weeks in the past. Participants were asked to maintain a sexual behavior diary for 2 weeks at a time, which may not have been long enough to capture average behaviors. A diary administered over several months (e.g., 2–3 months) may have provided more time for participants to report their average sexual behaviors. However, keeping a diary for lengthy periods may become tedious for participants and may not be a sustainable option over time for valid and reliable data. Further studies with a larger sample size, longer data collection period, longer lapse in time between the administration of the survey and diary, and questions regarding social and cultural norms influencing reports of sexual practices should be explored among military personnel. Additionally, studies addressing the validity and reliability of reported sexual behaviors collected from a diary and survey over a longer period of time are needed.

CONCLUSIONS

In summary, this study found that most sexual behaviors reported in the retrospective survey were similar to those found in the prospective diary, with the exception of behaviors associated with having a regular partner, reports of exchanging material goods for sex with a casual partner, and reports of some retrospective condom use categories. Inconsistencies may be explained by the frequency of the sexual behavior, question sensitivity, the data collection setting, and the interpretation of response categories. When collecting self-reported sexual behaviors, it is important for researchers to consider the most appropriate method of data collection for their study population and employ methods to improve validity. When using a retrospective survey, researchers should consider incorporating memory tools (e.g., calendar) and appropriate question formatting techniques (e.g., partner-by-partner approach or adding percentiles to each condom use frequency response category) to help participants remember their past behaviors and more accurately categorize their condom use behaviors. Due to strict participant eligibility criteria, study results may not be generalizeable to other populations. Further studies in this military, as well as in other militaries and heterogeneous populations, are needed to gain a better understanding of reporting behaviors and cultural and social norms that may affect reporting, and to evaluate other data collection methods that may increase reporting accuracy.

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14. ABSTRACT

Self-reported sexual behaviors from a retrospective survey relative to a prospective diary were compared among 161 male Botswana Defence Force (BDF) soldiers. Participants completed two post-intervention weekly sexual behavior diaries and a retrospective survey that queried them about behaviors reported in the same time frame as the prospective diaries. Agreement between the diary and survey was low for reported sex with a spouse and the exchange of material goods for sex with a casual partner. Under- and over-reporting of sex was also observed for spousal and regular non-cohabitating partners, respectively. Frequency of sex and condom use rates among those who had a spouse also differed between the modalities. When comparing condom use frequency from the survey and condom use rates from the diary, agreement between the two diminished as we moved further away from the "always" using condoms category. Retrospective surveys are useful for measuring recent sexual behaviors, while prospective diaries may be more reliable in collecting routine and sensitive sexual practices in the BDF. Further research among military personnel is needed to better understand reporting behaviors in this population and examine other data collection methodologies that will improve reporting accuracy.

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