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The reliability of sensitive information provided by injecting drug users in a clinical setting: Clinician-administered versus audio computer-assisted self-interviewing (ACASI)

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Research with injecting drug users (IDUs) suggests greater willingness to report sensitive and stigmatised behaviour via audio computer-assisted self-interviewing (ACASI) methods than during face-to-face interviews (FFIs); however, previous studies were limited in verifying this within the same individuals at the same time point. This study examines the relative willingness of IDUs to report sensitive information via ACASI and during a face-to-face clinical assessment administered in health services for IDUs. During recruitment for a randomised controlled trial undertaken at two IDU-targeted health services, assessments were undertaken as per clinical protocols, followed by referral of eligible clients to the trial, in which baseline self-report data were collected via ACASI. Five questions about sensitive injecting and sexual risk behaviours were administered to participants during both clinical interviews and baseline research data collection. ''Percentage agreement'' determined the magnitude of concordance/discordance in responses across interview methods, while tests appropriate to data format assessed the statistical significance of this variation. Results for all five variables suggest that, relative to ACASI, FFI elicited responses that may be perceived as more socially desirable. Discordance was statistically significant for four of the five variables examined. Participants who reported a history of sex work were more likely to provide discordant responses to at least one socially sensitive item. In health services for IDUs, information collection via ACASI may elicit more reliable and valid responses than FFI. Adoption of a universal precautionary approach to complement individually tailored assessment of and advice regarding health risk behaviours for IDUs may address this issue.

Keywords: reliability; injecting drug use; risk reporting/disclosure; primary healthcare; socially desirable behaviours; stigma

Introduction

Social desirability bias is a type of reporting bias that occurs when individuals deny or under-report engaging in what they perceive as socially undesirable behaviours (Rosenthal, Persinger, & Fode, 1962). Social desirability bias can have significant implications for patient care in the clinical setting, and data validity in the research setting (King & Bruner, 2003). Comprehensive service delivery in healthcare settings may be compromised if such bias is present to a significant degree.

Interviewer-administered face-to-face interview (FFI) methods typically result in reporting of lower rates of socially sensitive risk behaviours compared to self-administered questionnaires, a pattern attributed to social desirability bias (White, Day, & Maher, 2007). Consequently, along with their other advantages (e.g., relatively fewer resource implications), self-administered questionnaires are commonly used to facilitate response anonymity and reliability. Audio computer-assisted self-interviewing (ACASI) is a data collection method that allows respondents to answer questionnaires without the direct participation of an interviewer (Des Jarlais et al., 1999). During ACASI, questions are administered audibly and in text on a computer screen, facilitating its use among individuals with poor literacy skills or impaired vision or hearing.

Previous studies on the comparative reliability of data collected from drug users via ACASI and FFI report mixed results. For example, in a study of risk behaviours among needle syringe programme (NSP) clients, Des Jarlais et al. (1999) found that respondents for whom data were collected via ACASI were more likely than those assigned to FFI to report injection with used injecting equipment, distributing

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used equipment and paying for sex. Conversely, a survey of HIV risk behaviour among adolescents in drug treatment found significantly higher reporting of alcohol and drug use and sexual risk behaviour among participants from whom data were collected via FFI compared to those who undertook ACASI (Jennings, Lucenko, Malow, & Devieux, 2002).

Together, these findings suggest the possibility of situation-specific, differential impact of assessment via ACASI. However, these studies were limited by the fact that the same participants did not undertake both FFI and ACASI. In just two studies were the same injecting drug users (IDUs) asked to complete both ACASI and FFI (Ghanem, Hutton, Zenilman, Zimba, & Erbelding, 2005; Kurth et al., 2004). However, these participants constituted only small proportions of broader samples recruited in sexual health settings; and in only one of the two studies were the data collected from IDUs (assessing lifetime prevalence of receptive syringe sharing) presented separately.

The literature suggests that in NSP settings, drug use and sexual behaviours are acknowledged by staff without judgement or sanction, and that this environment may increase IDUs' willingness to disclose risk behaviours (Rich et al., 2004). Such disclosure is important in healthcare settings for IDUs, where blood-borne virus and sexual health risk assessment and management are core activities. Accordingly, it could be that in NSP and associated healthcare services ACASI offers no significant benefit over FFI administered by compassionate and non-judgemental staff.

The aim of this study was to compare responses provided by IDUs attending health services co-located with an NSP to the same, potentially socially sensitive questions administered via both (1) FFI administered by a clinician of that service and (2) ACASI. Specifically, we examined potential differences in (1) clients' willingness to report sensitive information via clinical FFI and ACASI and (2) responses elicited across the two interview modes according to participant characteristics.

Method

Study participants were drawn from the Hepatitis B Acceptability and Vaccination Incentive Trial (HAVIT), a randomised controlled trial of the efficacy of incentive payments in increasing hepatitis B vaccination completion among IDUs (Topp et al., 2011). HAVIT recruited from two low-threshold health centres that target IDUs in Sydney, Australia (Day et al., 2011; van Beek, 2007). Such low-threshold centres remove most barriers faced by IDUs in accessing traditional health services, by providing, for example, services free-of-charge and on anonymous and drop-in bases (Islam, Topp, Day, Dawson, & Conigrave, 2012). Participants deemed eligible for inclusion in HAVIT (and thus the present study) were aged 16 years and above; had injected drugs in the preceding six months; reported no previous HBV infection and a maximum of one previous vaccination dose, or unknown infection and vaccination status; were able to provide informed consent; and were willing to be randomised, to undertake vaccination and to attend follow-up 12 weeks post-randomisation. Exclusion criteria were: evidence of natural or vaccine-induced immunity; serological evidence of previous HBV infection or vaccination; mental or physical illness or disability likely to impact capacity to complete study procedures; insufficient English language skills to allow provision of informed consent or reliable responses to questionnaires; HIV infection; and refusal to undertake vaccination (Deacon et al., in press).

Participant characteristics reported in this study were drawn from HAVIT baseline data collection, which occurred via ACASI in private following assurances of confidentiality. Consistent with standard clinical protocols, participants firstly underwent a clinical assessment conducted by attending clinicians (nurses/doctors) via FFI, covering client demographics, sexual health, drug health and mental health issues. Five questions that may engender social desirability bias (Des Jarlais et al., 1999) relating to injecting and sexual risk behaviours were administered in both interview modes, allowing examination of the degree of concordance of these responses. The five items assessed age of onset of injecting, lifetime and recent history of receptive syringe sharing, recent receptive sharing of ancillary equipment and recency of last unprotected sex. FFI data were extracted from clients' medical files; and ACASI data from the HAVIT baseline data-set. To ensure inter-interview comparability of responses, only clients whose FFI and ACASI data collection were conducted within a one week period were included in this analysis.

Participants provided written informed consent. Ethics approval for the study was granted by the Royal Prince Alfred Hospital, South Eastern Sydney and Illawarra Area Health Service Northern Hospital Network and the University of New South Wales Human Research Ethics Committees.

Data analysis

Percentage agreement (the sum of agreement divided by the sum of agreement plus disagreement)

(Hartmann, 1977) was calculated to determine the magnitude of concordance/discordance in responses elicited by the two interview methods. This measure thus calculates the proportion of participants whose responses match, or are concordant, across the two data collection formats (Last, 2001). Kappa was not considered appropriate because it is influenced by trait prevalence (distribution) and base-rates (Spitznagel & Helzer, 1985; Uebersax, 1987). A 5-point scale captured the recent episode of unprotected sex by assigning the following values: never = 0, year[s] ago = 1, month[s] ago = 2, week[s] ago = 3 and day[s] ago = 4. Tests appropriate to data format (continuous, binary, ordinal) assessed concordance/discordance of responses across interview modes, with significant results indicative of significant discordance. The intraclass correlation coefficient (ICC) was used to compare participants' reported age of onset of injecting, the Wilcoxon signed rank test to compare reports of recent unprotected sex; and McNemars Chi-square (χ^2) to compare reports of lifetime and recent receptive sharing of injecting equipment. Multivariate logistic regression analyses examined potential differences between demographic, drug use and recruitment characteristics of participants who provided concordant responses to all five items across the two interview modes (''concordant'' group) and those who provided discordant responses to one or more items (''disconcordant'' group). Odds ratios (OR) with 95% confidence intervals (CIs) assessed associations between covariates and concordance. Variables correlated at $p < 0.25$ at the univariate level were included in multivariate models, which were refined using backwards elimination. Data were analysed using STATA (version 11).

Results

Of 178 participants recruited from the two PHCs, 171 had information collected via both FFI and ACASI within a one week period. Participants' mean age was 36.3 years (SD $\pm$ 8.95) and 77% were male (Table 1, column 2). Fourteen per cent identified as Aboriginal and/or Torres Strait Islander, 16% were born outside Australia and 44% had not completed secondary education. Most (84%) clients reported receiving government welfare and 52% reported a history of imprisonment. Twenty-seven per cent reported a lifetime history of sex work; while 56% reported a previous mental health diagnosis.

Thirty-four per cent ($N = 59$) of participants provided concordant responses across the two interview modes to all five items, whereas the remaining $N = 114$ participants provided discordant responses to one or more of the five items. Percentage agreement between responses across the two interview formats ranged from 70% (recency of last unprotected sex) to 89% (lifetime prevalence of receptive syringe sharing; Tables 2 and 3). Compared to the responses elicited by ACASI, responses provided during FFI suggested a significantly higher mean age of first injection, lower prevalence of recent receptive sharing of both syringes and ancillary injecting equipment and a longer duration since last unprotected sex (Tables 2 and 3). Participants also reported a lower lifetime prevalence of receptive syringe sharing during FFI (Table 2); however, the level of discordance across interview modes for responses to this item was not statistically significant. Thus, relative to ACASI, FFI elicited responses from participants that may be perceived as more socially desirable on all five variables of interest, with levels of discordance statistically significant in four cases.

Just one participant characteristic was significantly correlated at the univariate level with provision of one or more discordant responses (Table 1). Compared to participants who provided a full set of concordant responses, those who provided one or more discordant responses were significantly more likely to report a lifetime history of sex work. This characteristic, along with other variables that were correlated at $p < 0.25$ were entered into multivariate logistic regression models, with only history of sex work remaining significant. Thus, participants who reported a history of sex work were more likely than those who did not to provide discordant responses to one or more of the five socially sensitive items (OR = 2.78, 95%CI 1.24, 6.24).

To further explore the significant association between history of sex work and provision of one or more discordant responses, Pearson's χ^2 examined the proportions of participants who did and did not report a history of sex work who provided discordant responses to each of the five items. There were no significant differences between the proportions of the two groups who provided discordant responses to the four drug-related items (results not shown). In contrast, participants who reported a history of sex work were significantly more likely than those who did not to provide discordant responses to the item assessing recency of last unprotected sex (42% versus 25%; $\chi^2 = 4.56$; $p < 0.05$).

Discussion

Compared to responses elicited from IDUs regarding their risk behaviours during a face-to-face clinical interview, ACASI consistently extracted responses

Table 1. Demographic characteristics of 173 participants and relationship to discordance in responses to sensitive questions.

Variable	Total sample ($N = 173$)	Discordant ($N = 114$)	Concordant ($N = 59$)	Univariate relationship		Multivariate relationship	
				OR (95% CI)	*p*-value	AOR (95% CI)	*p*-value
Mean age in years (SD; range)	36.27 (8.95; 20–60)	36.51	35.60	1.01 (0.98, 1.05)	0.53	–	–
Gender (%)							
Male	133 (77)	87 (77)	46 (78)	1.00			
Female	39 (23)	26 (23)	13 (22)	1.06 (0.50, 2.25)	0.89	–	–
Australian-born (%)	146 (84)	95 (83)	51 (86)	0.78 (0.32, 1.92)	0.59	–	–
English speaking background (%)	166 (96)	110 (96)	56 (95)	1.47 (0.32, 6.81)	0.62	–	–
Indigenous Australian descent (%)	25 (14)	18 (16)	7 (12)	1.39 (0.55, 3.55)	0.49	–	–
Four + years high school education (%)	98 (57)	61 (54)	37 (63)	0.86 (0.36, 1.30)	0.25	–	–
Government benefit main source of income (%)	146 (84)	98 (86)	48 (81)	1.40 (0.60, 3.26)	0.43	–	–
Lifetime history sex work (%)	47 (27)	38 (33)	9 (15)	2.78 (1.24, 6.24)	0.01	2.78 (1.24, 6.24)	0.01
Sexual identity (%)							
Heterosexual (reference)	155 (90)	103 (90)	52 (88)	1.00			
Bisexual/Homosexual	18 (11)	11 (10)	7 (12)	0.79 (0.29, 2.17)	0.65	–	–
Lifetime history of imprisonment (%)	90 (52)	64 (56)	26 (44)	1.62 (0.86, 3.06)	0.13	–	–
Lifetime history mental health diagnosis (%)	97 (56)	63 (55)	34 (58)	0.91 (0.48, 1.71)	0.77	–	–
Current mental health medication (%)	60 (35)	40 (35)	20 (34)	1.05 (0.54, 2.04)	0.88	–	–
Heroin injected recently (%)	91 (53)	62 (54)	29 (49)	1.23 (0.66, 2.31)	0.51	–	–
Receive most healthcare from these clinics (%)	61 (35)	42 (37)	19 (32)	1.23 (0.63, 2.39)	0.54	–	–
Has another healthcare provider (%)	103 (60)	69 (61)	34 (58)	1.13 (0.59, 2.13)	0.71	–	–
Recruitment site 1	87 (50)	63 (55)	24 (41)	1.80 (0.95, 3.41)	0.07	–	–

Table 2. Comparison of responses provided in ACASI and FFI to binary items.

Variable	FFI	ACASI		Percentage agreement (total)	Test statistic, p
		Yes (%)	No (%)		
Receptive syringe sharing, ever ($N=168$)	Yes (%)	96 (57)	7 (4)	89.29	$\chi^2=0.89$; $p=0.48$
	No (%)	11 (7)	54 (32)		
Receptive syringe sharing, preceding month ($N=162$)	Yes (%)	11 (7)	1 (1)	83.33	$\chi^2=23.15$; $p<0.01$
	No (%)	26 (16)	124 (77)		
Receptive sharing ancillary equipment, preceding month ($N=165$)	Yes (%)	23 (14)	11 (7)	72.12	$\chi^2=12.52$; $p<0.01$
	No (%)	35 (21)	96 (58)		

Note: χ^2, McNemars chi-square.

Table 3. Comparison of responses provided in ACASI and FFI to non-binary items.

Variable	FFI	ACASI	Percentage agreement (total)	Test statistic, p	95% CI
Mean age onset of injecting ($\pm$SD) ($N=171$)	21.4 ($\pm$7.43)	20.9 ($\pm$7.39)	70.18	ICC = 0.94; $p<.001$	0.92,0.96
Number of clients reported higher age (%)	32 (19)	19 (11)			
Recent unprotected sex ($N=166$)					
Never (%)	10 (6)	10 (6)	69.88	$Z=-2.73$; $p<0.01$	–
Year[s] ago (%)	50 (30)	47 (28)			
Month[s] ago (%)	56 (34)	46 (28)			
Week[s] ago (%)	24 (14)	27 (16)			
Day[s] ago (%)	26 (16)	36 (22)			
Number of clients reported recent unprotected sex (%)	17 (10)	33 (20)			

Note: ICC, intraclass correlation coefficient; Z, Wilcoxon signed rank.

that may be perceived as less socially desirable, including a significantly lower age of onset of injecting, recent unprotected sexual intercourse and higher rates of receptive sharing of both syringes and ancillary injecting equipment. These findings are consistent with other studies of ACASI methodology undertaken in research rather than clinical settings (Des Jarlais et al., 1999; Macalino, Celentano, Latkin, Strathdee, & Vlahov, 2002; Metzger et al., 2000); and suggest that even in healthcare settings for IDUs, where drug use is acknowledged and the environment is clinical and non-judgmental (Rich et al., 2004), reports of sensitive behaviours relating to drug use and sexual practices during face-to-face clinical assessments may be under-reported. Just one variable assessed in this study was associated with an increased likelihood of provision of one or more discordant responses, namely a history of sex work. Post-hoc exploration of this relationship indicated that participants who reported a history of sex work were specifically more likely to provide discordant responses to the item assessing recency of unprotected sex but not to items assessing receptive sharing of injecting equipment, a pattern of results which may indicate perceived greater social stigma on the part of these clients to disclose sexual than injecting-related risk-taking.

Although we cannot state conclusively that the lower prevalence of risk behaviour reported during FFI is attributable to social desirability bias, nor that these rates are more valid than the higher prevalence reported with ACASI, social desirability theory (Crowne & Marlowe, 1960) suggests systematic under-reporting of stigmatised behaviours and that higher rates of reported risk behaviour are more likely to be valid than lower rates. Proponents suggest that social desirability bias is reduced during ACASI due to circumvention of the need to disclose sensitive behaviours directly to an interviewer (Perlis, Des Jarlais, Friedman, Arasteh, & Turner, 2004).

In addition, the simultaneous visual (computer screen) and verbal (recorded speakers) presentation of questions may encourage participants to attend more closely to specific questions. Flexible response-time in ACASI relative to FFI may also contribute to the differences in responses, as inherent in the latter is the expectation implicit in typical verbal dialogue that clients will respond promptly.

Audio computer-assisted self-interviewing might play an important role in eliciting responses from participants that may be perceived as less socially desirable. For example, ACASI could be used to complement face-to-face clinical assessments and the ACASI information provided in a risk aggregate format (e.g., client at low or high risk) to the clinician for discussion (Wand, Guy, Donovan, & McNulty, 2011). Alternatively, a ''universal precautions'' approach to risk behaviour can be argued for in guiding blood-borne viral and sexually transmitted infection screening and prevention in this group. Such a universal approach would complement (rather than replace) individually tailored assessment and advice.

Consistent with feedback from drug users in other settings (Shakeshaft, Bowman, & Sanson-Fisher, 1998), and other populations (Gerbert, Bronstone, McPhee, Pantilat, & Allerton, 1998; Kurth, et al., 2004), our participants felt comfortable using ACASI. The touch-screen ACASI was an additional advantage (Westman, Hampel, & Bradley, 2000). Kurth et al. (2004) reported that 82% of participants said ACASI allowed more honest reporting (compared to 7% for FFI, and 9% who perceived that both interview formats were equally conducive to honesty). ACASI has the additional advantage of reducing missing data because it requires participants to answer each item before they can proceed (Hallforsa, Khatapoushb, Kadushinb, Watsonb, & Saxeb, 2000). However, it is unlikely that ACASI could fully replace FFI in the clinical setting, as history-taking is an integral part of client/patient engagement, with the clinician responding to client priorities, and tailoring questions to raise client awareness of health issues. Clinical assessment also extends beyond words to non-verbal communication; and resourcing ACASI technology may present a major barrier in many settings.

Our study has several limitations. First, some of the discordance in responses attributed to social desirability bias may reflect other inherent biases, such as participants' understandings of the different contexts – clinical and research – in which the data were collected, and their (unmeasured) beliefs regarding potential benefits to themselves and/or the broader population of IDUs that might accrue from providing particular responses within those specific contexts. Second, our data cannot discount possible interactions between individual clinicians and clients that may engender a desire among some clients to provide socially desirable responses during FFI. Indeed, our results provide some indication that this may be the case, with recruitment site correlated in univariate analysis at $p = 0.07$ with provision of discordant responses to one or more socially sensitive items. At one clinic, any of a large number of healthcare workers may conduct FFI assessments, whereas at the other recruitment site, a single individual conducted the great majority ($>90\%$) of clinical assessments. Nevertheless, the difference in the proportion of clients recruited from the two sites who provided one or more discordant responses was not significant, suggesting that this source of variance cannot fully account for observed discordance.

Third, a certain degree of discordance is highly likely to be due to random error/poor recall rather than deliberately enacted social desirability bias. To examine this possibility, however, we compared responses provided across the two interview formats to three items considered unlikely to engender social desirability bias (date of birth, country of birth, gender) and found no significant discordance (results not shown), a pattern of results consistent with the notion of systematic social desirability bias in relation to the more sensitive items. Fourth, 91% of participants underwent clinical FFI followed by ACASI on the same day, and may have felt pressure to maintain consistency in their responses between the two interviews. Additionally, as FFI preceded ACASI, FFI may have acted as a memory prompt, leading to increased reporting of risk behaviours during subsequent ACASI. To eliminate this potential bias, future research should engage a cross-over design, in which half of the participants complete ACASI first while the other half begin with FFI. Finally, our study included only participants who met HAVIT eligibility criteria, and as such, results may not be generalisable to the broader IDU population.

In conclusion, the role of ACASI may not be limited to data collection/research, but may extend to a range of clinical environments and to population subgroups from whom sensitive information is currently collected via self-report. Although ACASI is unlikely to be appropriate for many clinical contexts, our results suggest that it may complement pen-and-paper FFI. Along with tailoring their approach to an individual's risk profile as assessed through FFI, clinicians should adopt a universal precautionary approach to acknowledge the likelihood that clients may choose to disclose only selected information regarding their history and risk profile.

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