

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/281167343>

Fertility intentions, power relations and condom use within intimate and other non-paying partnerships of women in sex work in Bagalkot District, South India

Article *in* AIDS Care · August 2015

DOI: 10.1080/09540121.2015.1050981 · Source: PubMed

CITATIONS

0

READS

42

9 authors, including:



[Souradet Y Shaw](#)

University of Manitoba

69 PUBLICATIONS 639 CITATIONS

[SEE PROFILE](#)



[Satyanarayana Ramanaiik](#)

Karnataka Health Promotion Trust

15 PUBLICATIONS 38 CITATIONS

[SEE PROFILE](#)



[Parinita Bhattacharjee](#)

University of Manitoba

73 PUBLICATIONS 522 CITATIONS

[SEE PROFILE](#)



[Stephen Moses](#)

University of Manitoba

332 PUBLICATIONS 8,207 CITATIONS

[SEE PROFILE](#)

This article was downloaded by: [122.181.14.102]

On: 23 August 2015, At: 22:28

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: 5 Howick Place, London, SW1P 1WG



AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/caic20>

Fertility intentions, power relations and condom use within intimate and other non-paying partnerships of women in sex work in Bagalkot District, South India

Kathleen N. Deering^{ab}, S.Y. Shaw^c, L.H. Thompson^c, S. Ramanaik^d, T. Raghavendra^d, M. Doddamane^d, P. Bhattacharjee^d, S. Moses^{ce} & R. Lorway^c

^a Faculty of Medicine, Division of AIDS, University of British Columbia, Vancouver, Canada

^b BC Centre for Excellence in HIV/AIDS, St. Paul's Hospital, Vancouver, Canada

^c Faculty of Medicine, Community Health Sciences, University of Manitoba, Winnipeg, Canada

^d Karnataka Health Promotion Trust, Bangalore, India

^e Faculty of Medicine, Medical Microbiology, University of Manitoba, Winnipeg, Canada

Published online: 21 Aug 2015.



[Click for updates](#)

To cite this article: Kathleen N. Deering, S.Y. Shaw, L.H. Thompson, S. Ramanaik, T. Raghavendra, M. Doddamane, P. Bhattacharjee, S. Moses & R. Lorway (2015): Fertility intentions, power relations and condom use within intimate and other non-paying partnerships of women in sex work in Bagalkot District, South India, *AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV*, DOI: [10.1080/09540121.2015.1050981](https://doi.org/10.1080/09540121.2015.1050981)

To link to this article: <http://dx.doi.org/10.1080/09540121.2015.1050981>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

Fertility intentions, power relations and condom use within intimate and other non-paying partnerships of women in sex work in Bagalkot District, South India

Kathleen N. Deering^{a,b*}, S.Y. Shaw^c, L.H. Thompson^c, S. Ramanaik^d, T. Raghavendra^d, M. Doddamane^d, P. Bhattacharjee^d, S. Moses^{c,e} and R. Lorway^c

^aFaculty of Medicine, Division of AIDS, University of British Columbia, Vancouver, Canada; ^bBC Centre for Excellence in HIV/AIDS, St. Paul's Hospital, Vancouver, Canada; ^cFaculty of Medicine, Community Health Sciences, University of Manitoba, Winnipeg, Canada; ^dKarnataka Health Promotion Trust, Bangalore, India; ^eFaculty of Medicine, Medical Microbiology, University of Manitoba, Winnipeg, Canada

(Received 12 January 2015; accepted 8 May 2015)

This study aimed to: (1) examine the relationship between interpersonal as well as social-demographic, cultural and structural factors, and condom non-use by sex workers' main intimate or other non-paying male sex partners (NPPs), as reported by a sample of sex workers; and (2) understand HIV/sexually transmitted infections (STIs) risk (e.g., numbers of sexual partners; condom use with different partners) among couples comprised of a sub-set of sex workers and their NPPs. Bivariate and multivariable logistic regression was used to identify factors associated with condom non-use at last sex by the main NPP, as reported by sex workers. Adjusted odds ratios and 95% confidence intervals are reported (AOR[95%CIs]). Data were drawn from cross-sectional surveys in Bagalkot District, Karnataka State, South India. Responses by sex workers whose main NPPs agreed to enrol in the study and the main NPP enrolled were linked; these responses by couples (pairs of sex workers and NPPs) were examined for responses to sexual risk for HIV/STIs. Overall, this study included 257 sex workers and 76 NPPs. The data from 67 couples (88.2%) could be linked. In over a quarter of partnerships, at least one (SW or NPP) partner reported having another type of partner besides each other (and clients of SWs). In multivariable analysis, significantly increased odds of condom non-use at last sex with the main NPP were found for the following key factors: planning to have a child with their main NPP (AOR = 3.71[1.44–9.58]); and having decisions about condom use made by their main NPP (AOR = 9.87[4.03–24.16]) or both equally (AOR = 3.18 [1.39–7.80]) (instead of by the sex workers herself). Our study highlights the potential risk for HIV/STI acquisition and transmission between NPPs and sex workers, and between NPPs and their non-sex workers wives and other sex partners. Study results underscore the need for HIV/STI prevention approaches that incorporate informed decision-making about childbearing and parenting, and empowerment strategies for sex workers within the context of NPPs.

Keywords: Sex workers; intimate or other non-paying partners; regular partners; intimate partners; non-paying partners; HIV risk; condoms

Introduction

HIV prevalence remains high in many settings in South India (13.3% across three districts in Karnataka State 2009–2010) (Moses et al., 2011). While women who engage in sex work (sex workers “SWs”) have been shown to be at heightened vulnerability to contracting HIV through commercial sex partnerships, the role of intimate or other non-paying partnerships (NPPs) in shaping vulnerability of SWs in South India to HIV and other sexually transmitted infections (STIs) is unclear. Across four southern Indian states, unmarried SWs were more likely to be HIV-positive compared to married SWs (Ramesh et al., 2008) and in Goa, SWs without an intimate partner were more likely to have contracted a bacterial STI (Shahmanesh et al., 2009). In northern Karnataka, not having a

regular partner was associated with increased HIV-related mortality (Becker et al., 2012). These results may be explained in part by the benefits that having a male partner can afford, such as increased social status and independence (e.g., safety and respect in communities; ability to rent houses). Male partners of SWs may be supportive by providing greater financial and social security and reduced dependence on sex work (Panchanadeswaran et al., 2008).

However, qualitative research from India suggests that “unstable marriages” and unreliable partners are a key reason for some women to initiate sex work, increasing women's economic disempowerment and dependence on sex work to support families (Panchanadeswaran et al., 2008). Condom use remains much lower with non-paying partners than within

*Corresponding author. Email: kdeering@cfnenet.ubc.ca

commercial sex transactions (Alary et al., 2002; Hemalatha, Kumar, Venkaiah, Srinivasan, & Brahmam, 2011; Murray et al., 2007; Reza-Paul et al., 2008; Stobenau, Hindin, Nathanson, Rakotoarison, & Razafintsalama, 2009; Voeten, Egesah, Varkevisser, & Habberma, 2007), and while large-scale HIV/STI prevention programmes in southern India have focused on increasing condom use within commercial sex transactions (“Avahan, the India AIDS Initiative – the Business of HIV prevention at Scale”, 2008; Jana, Basu, Rotheram-Borus, & Newman, 2004), few interventions focus on NPPs. Moreover, men who begin as clients and then capitalize on SWs’ need for social and financial support, or their unfamiliarity and isolation as new sex workers, may transition into exploitative pimps/main or regular partners who influence choice of clients, prices charged and condom use by clients (Karandikar & Prospero, 2010; Shannon et al., 2008). Among women outside of sex work, gender-based factors including women’s frequent economic and social dependence on male partners, fear of violence or negative reactions to discussions of condom use, along with fertility desires and pressures related to frequent childbearing for women of reproductive age, can lead to vulnerability to acquiring HIV/STIs from their main partner, principally through not using condoms (Ghosh, Wadhwa, & Kalipeni, 2009; Varma, Chandra, Callahan, Reich, & Cottler, 2010).

Given this evidence suggesting the potential for heightened vulnerability of SWs to HIV/STIs through intimate or other NPPs, research delineating the extent of this risk in India or elsewhere is surprisingly scarce. Quantitative studies that provide more than descriptive results are few. In these studies, information has primarily been collected from SWs rather than male partners (Deering et al., 2011; Jamner, Wolitski, Corby, & Fishbein, 1998), with a few exceptions in East Asia (Thailand and Vietnam) (Hoffman, Nguyen, Kershaw, & Niccolai, 2011; Shah et al., 2011). Epidemiological surveillance, research and HIV/STIs programming are often implemented without acknowledgement that condom negotiation and use, particularly within intimate or other NPPs, is complex and highly gendered, with the fertility desires and reproductive health needs of SWs almost universally ignored. At the same time, growing evidence supports directing intervention efforts towards intimate or other NPPs to maximize HIV/STIs prevention, particularly in settings with more mature epidemics and strong condom coverage in commercial partnerships (Vickerman et al., 2010; Watts et al., 2010). Therefore, gaining an understanding of the role of intimate or other NPPs in heightening or ameliorating SWs’ risk for contracting HIV serves as a key research priority. This study aimed to: (1) examine the

relationship between interpersonal as well as social-demographic, cultural and structural factors, and condom non-use by sex workers’ main intimate or other non-paying male sex partners (NPPs), as reported by a sample of sex workers; and (2) understand HIV/STIs risk (e.g., numbers of sexual partners; condom use with different partners) among couples comprised of a sub-set of sex workers and their NPPs.

Methods

Study design and sampling

The *Bagalkot Non-Paying Partners Pilot Study* was based in the northern Karnataka District of Bagalkot. Using time–location sampling (Stueve, O’Donnell, Duran, San Doval, & Blome, 2001), women >18 years who reported doing sex work (i.e., traded sex for money/gifts/shelter/food in the last month) and who had (at least one) current non-paying male sex partner, were recruited through ongoing outreach to outdoor and indoor sex work locations. “Non-paying partners” was a general term chosen to encompass non-marital, intimate or other non-paying partners. SWs could identify these partners as a “lover”, a “husband” or a *hiriya* or *malak*. Typically, “lover” is used by younger participants to refer to their intimate partners; “husbands” is used by SWs such as *Devadasi* to refer to an informal and long-standing relationship, since *Devadasi*, in accordance with tradition, are prohibited from becoming married. *Devadasi* refers to a traditional form of sex work involving a religious rite whereby girls and women are dedicated through marriage to gods and goddesses. *Devadasi* sex workers perform various temple duties, which over time have come to include the provision of sexual services to priests and patrons of temples (O’Neil et al., 2004). Finally, *hiriya* and *malak* are often used by older sex workers to refer to a more enduring, or regular non-paying partner with whom an emotional bond is shared. All surveys and interviews were conducted in *Kannada* (the local language), and informed consent was obtained. The study holds ethical approval through institutional review boards at the University of Manitoba, Winnipeg, Canada and St. John’s Medical College, Bangalore, India.

A brief cross-sectional survey was first administered to the 257 women recruited into the study. These responses were used to address Objective 1. Of this sample, 125 (48.6%) responded that their main NPP would be interested in the study, and 76 main NPPs (60.8%) agreed to respond to a brief questionnaire. Of these men, 67 were able to be linked to their female partner, and these responses by couples were used to address Objective 2. We aimed for a smaller

sample of NPPs for this pilot study since we were exploring the feasibility and acceptability of research with NPPs. Moreover, we aimed to reduce the risk of disclosure of sex work by female to male partners.

Outcome

The primary outcome in this study was condom non-use at last sex by the main NPP (i.e., reporting that condoms were not used during last sex), as reported by SWs.

Explanatory variables

We examined social-demographic, cultural and structural factors (e.g., age; age at first sex work; education as measured by if participants could read or write) and interpersonal factors relating to the relationship between SWs and their main NPP (e.g., cohabiting with male partner).

Analysis

To address Objective 1, using bivariate and multivariable logistic regression, we fitted a model for the relationship between explanatory variables and condom non-use (our primary outcome). Variables were included in the final multivariable model using a conceptual and statistical approach; based on previous research (Deering et al., 2011), the following variables were included a priori: age; duration since first sex with the main NPP; and duration since last sex with the main NPP. Other variables included as covariates included those that were significant on $p < .10$ -level in bivariate analysis. Multicollinearity was assessed using tolerance statistics and a variance inflation factor (VIF, with variables with a VIF > 2.5 considered to be collinear). To address Objective 2, responses by SWs and their NPPs were linked as couples, or pairs of SWs and NPPs, to examine how HIV/STIs might be acquired or transmitted to other partners (67 total couples).

Results

Female partners

Table 1 provides characteristics of SWs and interpersonal characteristics of the main partnership. Overall, 39.3% ($n = 101$) of SWs were < 25 years, the majority could not read or write (70.8%, $n = 182$) and over half identified as *Devadasi* (59.0%, $n = 151$), with 27.5% ($n = 96$) reporting being divorced/separated/widowed/single and just 3.5% ($n = 9$) married (Table 1). Almost half of SWs (48.0%, $n = 123$) reported that their first

sex partner was within the context of a first-night ceremony, and there was substantial overlap between reported places of solicitation, with the most common being home (74.2%, $n = 188$), followed by phone (43.3%, $n = 110$), rented room (35.0%, $n = 89$) and brothel (23.6%, $n = 60$) (results not shown).

Main male partners

Overall, 50% ($n = 38$) of main NPPs were < 30 years and 38.2% could not read or write ($n = 29$). The majority reported that they were married to someone other than their SW partner (76.0%, $n = 57$), with 22.7% ($n = 17$) reporting being never married and just 1.3% ($n = 1$) being separated. Most NPPs (56.2%, $n = 41$) reported that their first sex partner was a lover, with 20.5% ($n = 15$) reporting a commercial sex partner, 16.4% ($n = 12$) reporting a wife and 6.8% ($n = 5$) reporting a casual intimate or other non-paying partner. Just over half (56.8%, $n = 42$) reported that they had ever paid for sex with an SW and 54.7% ($n = 41$) of men who reported being a prior client of the SW partner (results not shown).

Characteristics of partnerships

Half of SWs described their main NPP as a lover (49.8%, $n = 124$), with 29.3% ($n = 73$) as a *hiriyal malak* and 20.9% ($n = 52$) as their husband (Table 1). Overall, 40.5% ($n = 102$) reported that their sexual relationship with their main NPP began < 5 years ago, with 59.5% ($n = 160$) reporting 5+ years. In general, SWs reported that they recently had sex with their main NPP, with half (49.8%, $n = 125$) reporting that they had sex with their main NPP within the last week. Half (50.6%, $n = 130$) currently had a child with the main NPP, 34.2% ($n = 88$) had a child with another partner and 23.7% ($n = 61$) planned to have a child with the main NPP (Table 1).

Condom use at last sex (Objective 1)

Table 1 provides bivariate and multivariable odds ratios for the relationship between explanatory factors and condom non-use reported by SWs with their main NPP. In bivariate analysis, significantly increased odds (on a $p < .10$ -level) of condom non-use at last sex were found for SWs who were younger (18–24 vs. 25+ years), not able to read and write, who were *Devadasi*, whose main NPP was their husband or a *hiriyal malak* (vs. lover), who had sex with their main NPP recently (within the last week vs. $>$ one week ago), who had a child with the main NPP, who planned to have a child with the main NPP and for whom the decision to use

Table 1. Sample characteristics of sex workers, bivariate (ORs) and multivariable odds ratios (AORs) and 95% confidence intervals (95% CIs) and *p*-values for correlates of condom non-use at last sex with intimate or other non-paying partners.

		Proportion (<i>n/N</i>)	OR	[95% CIs]	<i>p</i>	AOR	[95% CIs]	<i>p</i>
<i>Social-demographic, cultural, structural</i>								
Age (years)	18–24 (vs. 25+)	39.3% (101/257)	1.73	1.02–2.95	.044	1.41	0.63–3.17	.403
Age at first sex (years)	<15 (vs. 15+)	53.4% (135/253)	0.98	0.58–1.63	.921	NS		
Age at first sex work (years)	<20 (vs. 20+)	79.5% (292)	1.56	0.84–4.55	.160	NS		
Devadasi	Yes (vs. no)	59.0% (151/256)	2.70	1.60–4.55	<.001	2.45	1.20–4.98	.014
Sex work sole income	Yes (vs. no)	50.2% (129)	1.04	0.63–1.72	.884	NS		
Cannot read/write	Yes (vs. no)	70.8% (182/257)	1.95	1.08–3.53	.027	1.92	0.84–4.39	.121
<i>Interpersonal (main NPP)</i>								
Type of main partner	Husband (vs. lover)	20.9% (52/249)	1.84	0.93–3.62	.079	2.95	1.19–7.27	.019
	Hiriyā/Malak (vs. lover)	29.3% (73/249)	2.89	1.51–5.52	.001	2.68	1.13–6.37	.026
Cohabiting with main partner last year	Yes (vs. no)	2.7% (7/257)	0.80	0.18–3.65	.773	NS		
Duration since first sex with main partner (yrs)	<5 (vs. 5+)	40.5% (102/252)	1.33	0.78–2.25	.291	NS		
Duration since last sex with main partner	Within last week (vs. > one week ago)	49.8% (125/251)	1.97	1.17–3.32	.011	1.46	0.74–2.87	.275
Has a child with main partner	Yes (vs. no)	50.6% (130/257)	1.74	1.04–2.90	.035	0.80	0.38–1.68	.552
Plans to have child with main partner	Yes (vs. no)	23.7% (61/257)	4.06	1.95–8.47	.000	3.71	1.44–9.58	.007
Has child with another partner	Yes (vs. no)	34.2% (88/257)	0.52	0.31–0.89	.017	0.68	0.32–1.45	.318
Main partner knows respondent does sex work	Yes (vs. no)	48.8% (123/252)	0.83	0.50–1.38	.472	NS		
Main partner was prior client	Yes (vs. no)	83.9% (208/248)	0.51	0.24–1.11	.090	0.49	0.17–1.38	.178
Main partner manages sex work	Yes (vs. no)	12.5% (32/257)	1.96	0.84–4.55	.119	NS		
Main partner provides sex work support	Yes (vs. no)	14.8% (38/257)	0.91	0.45–1.85	.801	NS		
Condom use decision	Main partner (vs. myself)	34.1% (86/252)	11.51	5.42–24.47	.000	9.87	4.03–24.16	.000
	Both equally (vs. myself)	31.7% (80/252)	3.53	1.85–6.71	.000	3.18	1.39–7.80	.006
Physical/sexual violence by main partner (ever)	Yes (vs. no)	24.9% (64/257)	1.28	0.70–2.33	.416	NS		

a condom was made by the main NPP or both equally (vs. by the SW partner). Significantly decreased odds of condom non-use at last sex were found for SWs who had a child with another male partner and whose main NPP was a former client.

In multivariable analysis, significantly increased odds of condom non-use at last sex with the main NPP were found for SWs who were *Devadasi* (AOR = 2.45, 95% CIs: 1.20–4.98), whose main NPP was a husband (AOR: 2.95, 95% CIs: 1.19–7.27) or a *hiriyā malak* (AOR: 2.68, 95% CIs: 1.13–6.37) (vs. lover), who planned to have a child with the main NPP (AOR = 3.71, 95% CIs: 1.44–9.58) and for whom the decision to use a condom was made by the main NPP (AOR = 9.87, 95% CIs: 4.03–24.16) or both

equally (AOR = 3.18, 95% CIs: 1.39–7.80) (vs. by the SW partner) (Table 1).

Couples (Objective 2)

Table 2 describes characteristics of 67 couples. The transmission potential of HIV/STIs between NPPs and SWs was substantial, due to high levels of condom non-use at last sex (SWs: 62.4%; NPPs: 60.5%), and the high level of recent sexual activity (median of eight sex acts in the last month, IQR: 2–15). Transmission potential through diverse patterns of outside partnerships was also considerable, with over a quarter of partnerships including at least one

Table 2. Characteristics of 67 female sex workers (FSWs) and their main non-paying partners (NPP) in northern Karnataka, India who could be linked as couples.

Factor	FSW		Main NPP	
	N = 67	% or median/ IQR	N = 67	% or median/ IQR
<i>Main non-paying partner (male and female)</i>				
Number of times had sex with main partner (last month)	65/67	12 (5–20)	67/67	10 (4–18)
Inconsistent condom use (current) with main partner	53/66	80.3%	55/67	82.9%
Condom non-use at last sex with main partner	44/66	66.7%	42/67	62.7%
<i>Other non-paying partners</i>				
Had other non-paying intimate sex partners (ever)	12/54	18.2%	15/67	22.4%
Had other non-paying intimate sex partners (last six months)	6/12	50.0%	7/15	46.7%
Number other non-paying intimate sex partners (last six months)	31/31	1 (1–2)	7	1 (1–2)
Inconsistent condom use (current) with other non-paying intimate sex partners	8/10	80.0%	4/7	57.1%
Condom non-use at last sex with second-important sex partner	7/10	70.0%	5/7	71.4%
<i>Commercial sex partners</i>				
Had commercial sex partners (ever)	n/a ^a	n/a ^a	25/65	38.5%
Had commercial sex partners (last six months)			8/65	12.3%
Number of commercial sex partners (last six months)				
Repeat	a	a	8	0.5 (0–2)
Occasional	a	a	8	1 (0–2.5)
Number of commercial sex partners (last week) ^a				
Repeat	65	2 (1–5)	a	a
Occasional	66	4.5 (2–10)	a	a
Inconsistent condom use (current) with commercial sex partners				
Repeat	1/66	1.5%	1/8	12.5%
Occasional	0/65	0.0%	0/8	0%
Condom non-use at last sex with commercial sex partner				
Repeat	0/67	0.0%	1/7	14.3%
Occasional	0/65	0.0%	1/8	12.5%

Notes: n/a refers to questions that are not applicable to the study population; that is, all female sex workers have ever had commercial sex partners.
^aQuestions that were not asked of the female sex worker or male non-paying partners because the timeframe over which the question referred to was not appropriate to that study population.

(SW or NPP) partner with another type of partner (besides each other and clients of SWs).

Overall, 22.1% of SWs reported ever having another NPP (55.4% in the last six months); again, condom non-use at last sex was high (48.8%). Similarly, 24.0% of NPPs reported ever having another non-paying female partner besides their main SW partner, with 44.0% of these being in the last year. Of NPPs, 43.2% reported ever having a commercial sex partner, with 12.2% reporting having at least one such partner in the last six months.

Discussion

Our study demonstrates that condom use remains low within main NPPs of SWs in southern India, a study setting with an extended history of exposure to HIV/STIs prevention interventions, with 62.4% of women

reporting not using condoms at last sex with their main NPP. In line with global calls, our study suggests that approaches to HIV/STIs prevention for SWs should include programming designed to address barriers to condom use within intimate or other NPPs alongside current approaches that focus on commercial sex transactions (Piot, 2010). These approaches should take into account the unique programming needs of women and men in intimate relationships, including those related to relationship identity, intimacy and fertility intentions.

Most NPPs in our study reported being married (76%), highlighting the transmission potential to their wives in the context of low condom use within regular and marital relationships in India. Even after adjusting for age and *Devadasi* status, SWs identifying the main NPP as a husband or a *hiriyal/malak* (vs. lover) had significantly increased condom non-use. Previous research in other southern Indian settings

suggested that lower condom use was more likely in relationships of longer duration, with non-paying partners twice as likely to have other sex partners or to ask SWs for anal sex relative to husbands or cohabiting partners (Deering et al., 2011). In our study, lower condom use was found among SWs who identified male partners as *hiriyas*, *malaks* and husbands, relative to lovers. This finding may be explained by the longer-standing and more enduring nature of these relationships, in which partners are likely to share an emotional bond.

The few studies on the reproductive health of SWs suggest that pregnancy and childbirth among SWs is common (Apte, Mali, Navle, & Revle, 2004; Duff et al., 2011; Sutherland et al., 2011), and that child caretaking responsibilities of SWs are linked to heightened HIV risk through reduced condom use (Reed et al., 2013). While we found statistically significant bivariate relationships between condom non-use with the main NPP and both having children with the main NPP and planning to have a child with the main NPP, in multivariable analysis only the latter association held as statistically significant. Women in India within and outside the context of sex work internalize social and moral expectations surrounding traditional masculine and feminine roles delineating that “good” women have children (Apte et al., 2004; Das Gupta, Chen, & Krishnan, 1995). Moreover, the stigma surrounding infertility places the onus on women to “prove” that they are not infertile by becoming pregnant (Apte et al., 2004). Complex feelings of love, support, intimacy and trust can also influence decisions to not use condoms within regular partnerships (Jackson et al., 2009), which may also be related to pregnancy desires and intent. We found an association between *Devadasi* sex work and condom non-use. Despite the fact that *Devadasi* cannot marry men, *Devadasi* experience social expectations for child-bearing attached to marriage in Indian society (Apte et al., 2004; O’Neil et al., 2004), suggesting that they may feel more pressure to become pregnant via a client, or a non-paying partner who may be more likely to provide emotional or economic support. A qualitative study in our study setting found that *Devadasi* sex workers and their intimate partners identified their relationships as “like marriage” – in other words, these relationships may include a high degree of trust, intimacy and/or longevity (Ramanaik et al., 2014). In this context, condom use is perceived as a sign of infidelity and can negatively impact these positive relationship qualities, reducing incentives to use condoms.

Our study also found a strong association between sexual decision-making power and condom non-use, with 10-fold elevated odds of condom non-use for women who reported that their male partners made

the decision about condom use and 3-fold elevated odds for women who reported that the decision was made together, relative to when the decision was made by the female partner. These results highlight the role that men play in determining condom use, even when decision-making is shared, and the preference of men relative to women for condom non-use. Importantly, these results also suggest that when women play a joint role in decisions about condom use, condoms are more likely to be used relative to when men solely make the decisions. Among women outside the context of sex work, decision-making dominance has been associated with increased condom use by regular partners (Harvey, Bird, Galavotti, Duncan, & Greenberg, 2002), while male control and power within relationships has been associated with increased HIV/STIs risk and condom non-use (Dunkle et al., 2004).

This finding suggests that prevention programming addresses empowerment of SWs may help support increased condom use within NPPs. Community-led approaches (e.g., *Sonagachi Project*, *Avahan Indian AIDS Initiative*) may serve as models for this type of programme (Jana et al., 2004; Piot, 2010). Evidence suggests that these approaches have been successful in India in increasing condom use within commercial sex transactions through increased skills in condom use sexual negotiation and decision-making practices, social support and collectivization and reducing environmental barriers, along with improved knowledge of HIV/STIs and condom use (Blankenship, West, Kershaw, & Biradavolu, 2008; Ramanaik et al., 2014; Reza-Paul et al., 2008; Swendeman, Basu, Das, Jana, & Rotheram-Borus, 2009).

Given that half of SWs have children with their main NPP and a quarter of them reported currently planning to have a child with their main NPP, our results suggest a substantial need for the integration of reproductive health programming within HIV/STIs prevention. Such programming should be sensitive to the reproductive health needs of women, including informed decision-making for family planning in the context of increased risk for HIV/STIs (Moses et al., 2011). Programming should be supportive of women’s reproductive choice; for women living with HIV who wish to become pregnant, ART should be readily accessible to reduce the likelihood of HIV transmission during unprotected sex. For pregnant HIV-positive women, ART should be available to reduce the likelihood of mother-to-child transmission and the potential benefits and risks of breastfeeding should be particularly promoted for HIV-positive mothers. Promoting condom use for contraception should be included an important co-message in HIV/STI programming, since this is low among SWs in similar settings (Wayal et al., 2011). In our study

setting, qualitative research suggests that participation in sex work collectives (*sanghas*) can support both SWs and male partners to participate in increased education and family planning services (Ramanaik et al., 2014).

Since sampling frames are difficult to construct for hidden populations, the sample was not randomly generated and may not be representative of all SWs in ours or other settings. Our smaller sample of NPPs (76/257) may not be representative of all NPPs of SWs in our sample, or all NPPs of SWs in ours or other settings. To help attract a representative sample of SWs, we recruited participants through systematic time–location sampling and targeted outreach to diverse sex work environments (Stueve et al., 2001). Our sample size of women was large enough to examine multivariable statistical associations between key factors (e.g., fertility desires; decision-making surrounding condom use), but our sample size of men was not. For this reason we were unable to examine multivariable statistical associations between key factors and condom non-use as reported by men, and confirm similar associations as found in the sample of women. However, since this was a pilot study, a smaller sample of men was expected. To start, less than half of women had main male partners who knew that they were in sex work and of the women whose main male partners knew they were in sex work, over half of male partners agreed to participate in our study. Future studies should explore strategies to increase recruitment and enrolment of main male partners of SWs into studies on HIV/STI prevention while ensuring a safe, respectful and confidential environment for women. Such strategies could include de-stigmatization and decriminalization of sex work and empowerment approaches to reduce gender and sexual inequalities and power imbalances in favour of male partners. As with all self-report data, participant responses may be subject to recall or social desirability bias. However, we had experienced, trained interviewers, and interviews were conducted in spaces where women were comfortable to facilitate accurate responses.

Our study highlights the risk for HIV acquisition and transmission between NPPs and SWs, and between NPPs and their non-SW wives and other sex partners. In a study setting with relatively high HIV prevalence among SWs, study results underscore the need for HIV/STIs prevention approaches that incorporate informed decision-making about childbearing and parenting, and empowerment strategies for SWs within the context of NPPs, as well as approaches that involve both women and male partners in the planning, development and implementation of programmes. The inclusion of NPPs in our study suggests promise for involving male partners in the planning, development and implementation of HIV/STIs programmes, including as research and programme participants.

Prevention strategies could be couples-focused and incorporate regular couples testing and counselling, including counselling for HIV sero-discordant couples on how to reduce the likelihood of HIV transmission.

Acknowledgements

KD made key contributions to the conceptual and analytic design of the study and drafted the manuscript. LT, SR, TR, MD, PB and SM made key conceptual contributions and reviewed the manuscript. SS performed statistical analysis and reviewed the manuscript. RL made key contributions to the conceptual and analytic design of the study and takes responsibility for the accuracy of the data. We would like to especially thank the women who participated in our study, as well as the study staff and local partners. We acknowledge the active participation and support of Chaitanya AIDS Tadegatwa Mahila Sangha in designing and conducting this study. We are very encouraged by the fact that the study findings have supported the CBO to design an intervention with non-paying partners in the region. We would also like to acknowledge the research and technical support of Dr James Blanchard. Kathleen Deering is supported by Post-Doctoral Research Fellowships from the Canadian Institutes of Health Research (Bisby Award) and the Michael Smith Foundation for Health Research. This study was supported in part by the Bill & Melinda Gates Foundation. The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Bill & Melinda Gates Foundation.

Funding

Funding support for this study came from STRIVE Structural HIV drivers Research Programme Consortium, funded by the Department For International Development, Government of UK, as well as the University of Manitoba.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

- Alary, M., Mukenge-Tshibaka, L., Bernier, F., Geraldo, N., Lowndes, C., Meda, H., ... Joly, J. R. (2002). Decline in the prevalence of HIV and sexually transmitted diseases among female sex workers in Cotonou, Benin, 1993–1999. *AIDS*, *16*, 463–470.
- Apte, H., Mali, L., Navle, M., & Revle, S. (2004). Womanhood first: Sex workers & infertility in Pune city. *Journal of Reproductive and Infant Psychology*, *22* (4), 271–277. doi:10.1080/02646830412331298323
- Avahan, The India AIDS Initiative – The Business of HIV prevention at Scale. (2008). Retrieved from http://www.gatesfoundation.org/avahan/Documents/Avahan_HIVPrevention.pdf

- Becker, M. L., Mishra, S., Satyanarayana, Gurav, K., Doshi, M., Buzdugan, R., ... Blanchard, J. F. (2012). Rates and determinants of HIV-attributable mortality among rural female sex workers in Northern Karnataka, India. *International Journal of STD & AIDS*, 23(1), 36–40. doi:10.1258/ijsa.2011.011017
- Blankenship, K. M., West, B. S., Kershaw, T. S., & Biradavolu, M. R. (2008). Power, community mobilization, and condom use practices among female sex workers in Andhra Pradesh, India. *AIDS*, 22(Suppl. 5), S109–S116.
- Das Gupta, M., Chen, L. C., & Krishnan, T. N. (1995). *Women's health in India: Risk and vulnerability*. Bombay: Oxford University Press.
- Deering, K. N., Bhattacharjee, P., Bradley, J., Moses, S., Shannon, K., Lowndes, C., ... Alary, M. (2011). Condom use within non-commercial partnerships of female sex workers in southern India. *BMC Public Health*, 11(Suppl. 6), S11.
- Duff, P., Shoveller, J., Zhang, R., Alexson, D., Montaner, J. S. G., & Shannon, K. (2011). High lifetime pregnancy and low contraceptive usage among sex workers who use drugs— an unmet reproductive health need. *BMC Pregnancy and Childbirth*, 11(61).
- Dunkle, K. L., Jewkes, R. K., Brown, H. C., Gray, G. E., McIntyre, J. A., & Harlow, S. D. (2004). Gender-based violence, relationship power, and risk of HIV infection in women attending antenatal clinics in South Africa. *Lancet*, 363, 1415–1421.
- Ghosh, J., Wadhwa, V., & Kalipeni, E. (2009). Vulnerability to HIV/AIDS among women of reproductive age in the slums of Delhi and Hyderabad, India. *Social Science & Medicine*, 68(4), 638–642. doi:10.1016/j.socscimed.2008.11.023
- Harvey, S. M., Bird, S. T., Galavotti, C., Duncan, E. A. W., & Greenberg, D. (2002). Relationship power, sexual decision making and condom use among women at risk for HIV/STDs. *Women & Health*, 36(4), 69–84. doi:10.1300/J013v36n04_06
- Hemalatha, R., Kumar, R. H., Venkaiah, K., Srinivasan, K., & Brahmam, G. N. V. (2011). Prevalence of & knowledge, attitude & practices towards HIV & sexually transmitted infections (STIs) among female sex workers (SWs) in Andhra Pradesh. *Indian Journal of Medical Research*, 134(4), 470–475.
- Hoffman, L., Nguyen, H., Kershaw, T., & Niccolai, L. (2011). Dangerous subtlety: Relationship-related determinants of consistency of condom use among female sex workers and their regular, non-commercial partners in Hai Phong, Viet Nam. *AIDS and Behavior*, 15(7), 1372–1380. doi:10.1007/s10461-010-9819-4
- Jackson, L. A., Augusta-Scott, T., Burwash-Brennan, M., Karabanow, J., Robertson, K., & Sowinski, B. (2009). Intimate relationships and women involved in the sex trade: Perceptions and experiences of inclusion and exclusion. *Health*, 13(1), 25–46. doi:10.1177/1363459308097359
- Jamner, S., Wolitski, R. J., Corby, N. H., & Fishbein, M. (1998). Using the theory of planned behavior to predict intention to use condoms among female sex workers margaret. *Psychology & Health*, 13(2), 187–205. doi:10.1080/08870449808406746
- Jana, S., Basu, I., Rotheram-Borus, M. J., & Newman, P. A. (2004). The Sonagachi project: A sustainable community intervention program. *AIDS Education and Prevention*, 16(5), 405–414.
- Karandikar, S., & Prospero, M. (2010). From client to pimp: Male violence against female sex workers. *Journal of Interpersonal Violence*, 25(2), 257–273.
- Moses, S., Ramesh, B. M., Isac, S., Reza-Paul, S., Alary, M., Bradley, J. E., ... Blanchard, J. (2011). Increased condom use and decreased HIV & STI prevalence among female sex workers following a targeted HIV prevention program in Karnataka, South India. *Sexually Transmitted Infections*, 87(Suppl. 1), A44.
- Murray, L., Moreno, L., Rosario, S., Ellen, J., Sweat, M., & Kerrigan, D. (2007). The role of relationship intimacy in consistent condom use among female sex workers and their regular paying partners in the Dominican Republic. *AIDS and Behaviour*, 11(3), 463–470.
- O'Neil, J., Orchard, T., Swarankar, R. C., Blanchard, J. F. J. F., Gurav, K., & Moses, S. (2004). Dhandha, dharma and disease: Traditional sex work and HIV/AIDS in rural India. *Social Science & Medicine*, 59(4), 851–860.
- Panchanadeswaran, S., Johnson, S. C., Sivaram, S., Srikrishnan, A. K., Latkin, C., Bentley, M. E., ... Celentano, D. (2008). Intimate partner violence is as important as client violence in increasing street-based female sex workers' vulnerability to HIV in India. *International Journal of Drug Policy*, 19(2), 106–112.
- Piot, P. (2010). Setting new standards for targeted HIV prevention: The Avahan initiative in India. *Sexually Transmitted Infections*, 86(Suppl. 1), i1–i2. doi:10.1136/sti.2009.040428
- Ramanaik, S., Thompson, L. H., Plessis, E. d., Doddamane, M., Battacharjee, P., Shaw, S. Y., et al. (2014). Long-term intimate partnerships of Devadasi sex workers in South India: An exploration of risks of HIV/STI transmission. *Global Public Health*.
- Ramesh, B. M., Moses, S., Washington, R., Isac, S., Mohapatra, B., Mahagaonkar, S. B., ... Blanchard, J. F. (2008). Determinants of HIV prevalence among female sex workers in four south Indian states: Analysis of cross-sectional surveys in twenty-three districts. *AIDS*, 22(Suppl. 5), S35–S44.
- Reed, E., Silverman, J. G., Stein, B., Erausquin, J. T., Biradavolu, M., Rosenberg, & Blankenship, K. M. (2013). Motherhood and HIV risk among female sex workers in Andhra Pradesh, India: The need to consider women's life contexts. *AIDS and Behavior*, 17(2), 543–550.
- Reza-Paul, S., Beattie, T., Syed, H. U. R., Venukumar, K. T., Venugopal, M. S., Fathima, M. P., ... Moses, S. (2008). Declines in risk behaviour and sexually transmitted infection prevalence following a community-led HIV preventive intervention among female sex workers in Mysore, India. *AIDS*, 22, S91–S100.
- Shah, N. S., Shiraishi, R. W., Subhachaturas, W., Anand, A., Whitehead, S. J., Tanpradech, S., ... Kim, Y. (2011). Bridging populations—Sexual risk behaviors and HIV

- prevalence in clients and partners of female sex workers, Bangkok, Thailand 2007. *Journal of Urban Health*, 88(3), 533–544.
- Shahmanesh, M., Cowan, F., Wayal, S., Copas, A., Patel, V., & Mabey, D. (2009). The burden and determinants of HIV and sexually transmitted infections in a population-based sample of female sex workers in Goa, India. *Sexually Transmitted Infections*, 85(1), 50–59. doi:10.1136/sti.2008.030767
- Shannon, K., Kerr, T., Allinott, S., Chettiar, J., Shoveller, J., & Tyndall, M. W. (2008). Social and structural violence and power relations in mitigating HIV risk of drug-using women in survival sex work. *Social Science and Medicine*, 66(4), 911–921.
- Stoebenau, K., Hindin, M. J., Nathanson, C. A., Rakotoarison, P. G., & Razafintsalama, V. (2009). “... But then he became my Sipa”: The implications of relationship fluidity for condom use among women sex workers in Antananarivo, Madagascar. *American Journal of Public Health*, 99(5), 811–819. doi:10.2105/ajph.2007.118422
- Stueve, A., O'Donnell, L. N., Duran, R., San Doval, A., & Blome, J. (2001). Time-space sampling in minority communities: Results with young Latino men who have sex with men. *American Journal of Public Health*, 91(6), 922–926.
- Sutherland, E. G., Alaii, J., Tsui, S., Luchters, S., Okal, J., King'ola, N., ... Janowitz, B. (2011). Contraceptive needs of female sex workers in Kenya – A cross-sectional study. *The European Journal of Contraception and Reproductive Health Care*, 16(3), 173–182. doi:10.3109/13625187.2011.564683
- Swendeman, D., Basu, I., Das, S., Jana, S., & Rotheram-Borus, M. J. (2009). Empowering sex workers in India to reduce vulnerability to HIV and sexually transmitted diseases. *Social Science & Medicine*, 69(8), 1157–1166. doi:10.1016/j.socscimed.2009.07.035
- Varma, D. S., Chandra, P. S., Callahan, C., Reich, W., & Cottler, L. B. (2010). Perceptions of HIV risk among monogamous wives of alcoholic men in South India: A qualitative study. *Journal of Women's Health*, 19(4), 815–821.
- Vickerman, P., Foss, A. M., Pickles, M., Deering, K., Verma, S., Demers, E., ... Boily, M.-C. (2010). To what extent is the HIV epidemic in southern India driven by commercial sex? A modelling analysis. *AIDS*, 24(16), 2563–2572. doi:10.1097/QAD.0b013e32833e8663
- Voeten, H. A. C. M., Egesah, O. B., Varkevisser, C. M., & Habberma, J. D. F. (2007). Female sex workers and unsafe sex in urban and rural Nyanza, Kenya: Regular partners may contribute more to HIV transmission than clients. *Tropical Medicine and International Health*, 12(2), 174–182.
- Watts, C., Zimmerman, C., Foss, A. M., Hossain, M., Cox, A., & Vickerman, P. (2010). Remodelling core group theory: The role of sustaining populations in HIV transmission. *Sexually Transmitted Infections*, 86(Suppl. 3), iii85–92. doi:10.1136/sti.2010.044602
- Wayal, S., Cowan, F., Warner, P., Copas, A., Mabey, D., & Shahmanesh, M. (2011). Contraceptive practices, sexual and reproductive health needs of HIV-positive and negative female sex workers in Goa, India. *Sexually Transmitted Infections*, 87(1), 58–64. doi:10.1136/sti.2010.043158