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Mobile phones and sex work in South India: The emerging role of mobile phones in condom use by female sex workers in two Indian states

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Abstract

The aim of this study was to examine female sex workers' solicitation of clients using mobile phones and the association between this and condom use with clients. Cross-sectional data were utilised to address the study's aim, drawing on data collected from female sex workers in Calicut, Kerala and Chirala, Andhra Pradesh. Use of mobile phone solicitation was reported by 46.3% (n = 255) of Kerala participants and 78.7% (n = 464) of those in Andhra Pradesh. Kerala participants reporting exclusive solicitation using mobile phones demonstrated 1.67 times higher odds (95% CI: 1.01–2.79) of inconsistent condom use than those reporting non-use of mobile phones for solicitation. However, those reporting exclusive solicitation through mobile phones in Andhra Pradesh reported lower odds of inconsistent condom use (OR: 0.03; 95% CI: 0.01–0.26) than those not using mobile phones for solicitation. Findings indicate that solicitation of clients using mobile phones facilitates or hampers consistency in condom use with clients depending on the context, and how mobile phones are incorporated into solicitation practices. Variations in sex work environments, including economic dependence on sex work or lack thereof may partially account for the different effects found.

Keywords

female sex work; HIV prevention; mobile phones; India

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Introduction

Contextual factors such as the availability of alcohol to clients and sex workers, vulnerability to violence and the inaccessibility of condoms in sex work venues contribute to inconsistent condom use between clients and sex workers (Gupta et al. 2008; Shannon et al. 2009; Reed et al. 2010; Bungay et al. 2011; George, Sabarway, and Martin 2011; Goldenberg et al. 2011; Reed et al. 2011; Safika, Johnson, and Levy 2011; Saggurti et al. 2011; Strathdee et al. 2011; Ross et al. 2012; Dasgupta 2013; Pitpitan et al. 2013; Safika, Levy, and Johnson 2013; Gurav et al. 2014). Recent studies have identified a new contextual factor, namely, the use of mobile phones by female sex workers to solicit clients, which has demonstrated independent risk associations with condom use in South India (Dodderi et al., 2012; Mahapatra et al. 2012). However, the mechanisms that may drive this association between sexual behaviour and mobile phone use for client solicitation are not well understood. Furthermore, recent studies to date have conceptualised mobile phone use for client solicitation largely as a uniform practice (Dodderi et al., 2012; Mahapatra et al. 2012). We argue that sex workers are likely to use multiple strategies to incorporate mobile phones into client solicitation. If this is indeed so, then it is unclear as to whether risk associations between mobile phone solicitation and condom use with clients are consistent across different strategies of mobile phone solicitation and across diverse sex work environments. A better understanding of mobile phones and their relationship with condom use may provide information regarding how to effectively incorporate mobile phones into future HIV prevention strategies targeting female sex workers. This line of enquiry could be particularly significant in the Indian context, where recent estimates indicated that female sex workers were 50 times more likely to live with HIV than all women of reproductive age and where mobile phone use is widespread (Singh 2008; Baral et al. 2012; Beattie et al. 2012). In this paper, we examined different ways in which mobile phones were used by female sex workers for client solicitation and the association with inconsistent condom use with clients in two South Indian states, namely, Andhra Pradesh and Kerala.

Mobile Phones and sex work: Implications for client solicitation

Solicitation of clients through mobile phones, as opposed to traditional solicitation via brothels or streets, provides two unique elements: increased connectivity and anonymity. A direct channel of communication between female sex workers and clients may create opportunities and constraints, enabling the sex workers to operate independently of centralised sex work venues and decreasing a need for traditional intermediaries such as brothel owners and pimps (Buzdugan, Halli, and Cowan 2012; Jain and Saggurti 2012; Reza-Paul et al. 2012). Furthermore, the increased level of anonymity associated with mobile phones may reduce the visibility of female sex workers, thus, resulting in less frequent interactions with legal authorities and potentially fewer instances of discrimination and exposure to the stigmatisation of sex work. The high level of anonymity afforded to clients may enable them to avoid known formal and informal sex work areas, thereby minimising their risk of being seen by family members or friends. The anonymity associated with the use of mobile phones may also negatively affect female sex workers. For example, increased anonymity may prevent health providers from delivering health and social services

to female sex workers. This is consistent with findings of decreased health service utilisation among mobile phone using sex workers in South India (Dodderi et al., 2012).

Mobile phone solicitation and condom use: Risk or protection?

An analysis of existing studies suggests some sex workers may use mobile phones only, while others use mobile phones and traditional modes of solicitation at sex work venues or through brokers such as pimps (Buzdugan et al. 2012; Dodderi et al., 2012; Mahapatra et al. 2012). In one study, sex workers who reported using mobile phones exclusively to solicit clients in South India reported sharing or selling client information to other female sex workers as a new strategy for attracting regular clients without using traditional sex work venues or brokers (Buzdugan et al. 2012). In this sense, the solicitation of clients through mobile phones may create new opportunities related to occupational and financial stability. However, this could also lead to new risks, wherein sex workers incur financial or social debts with their peers. This may, in turn, contribute to sexual risk behaviour with clients. For instance, these debts may create limitations for sex workers in regard to ability to negotiate safe sex practices with clients if this jeopardises financial transactions with clients. Debts may also limit a sex worker's ability to refuse high-risk clients when referred via peers since there may be a social debt to the referring sex worker (Buzdugan et al. 2012).

In addition, the capacity to attract regular clients may alter key aspects of client-sex worker interactions, making them more long-term and personal. This may have positive and negative implications for power and control dynamics between sex workers and their clients. In turn, these could influence condom use among female sex workers, particularly in resource-limited settings (Van Doorn 2011; Aube-Marice et al. 2012; Bricknell 2012).

Whether solicitation using mobile phones leads to more or less condom use may vary based on how mobile phones are incorporated into client solicitation strategies. If different mobile phone strategies are employed, then it is not clear whether these different strategies are associated with different levels of sexual risk behaviour. This would have implications for the quantification of sexual risk. However, there are no studies, to our knowledge, that have specifically examined different strategies used by sex workers in India to incorporate mobile phones into client solicitation.

With regard to intervention strategies, the wide use of and access to mobile phones offers health practitioners new pathways to reach sex workers, who are traditionally a hidden and hard-to-reach population in South India. However, to take advantage of the opportunities offered by mobile phone use, there is a need for researchers and practitioners to gain an in-depth understanding of how mobile phones are used and in turn, of the association between different use patterns and condom usage. To examine this issue, we identified two sites in two South Indian states, Andhra Pradesh and Kerala, which have different literacy rates and HIV epidemiology. The literacy rate in Chirala, a town in the state of Andhra Pradesh, is lower (77%) than the national urban average of 85%; in turn, the national average is lower than the 95% literacy rate of Calicut, a town in the state of Kerala (also known as Kozhikode) (Census Organization of India 2012). In addition, the two sites are dissimilar in terms of general HIV epidemiologic trends (National AIDS Control Organisation 2012; United Nations General Assembly Special Section 2010), although they both report high

HIV prevalence among female sex workers (National AIDS Control Organisation 2007). Andhra Pradesh is classified as a state with high HIV prevalence; the HIV prevalence rate among female sex workers in Chirala is 4% (National Institute of Health and Family Welfare and National AIDS Control Organisation 2006). Kerala is classified as a state with a low HIV prevalence rate for the general population, but reports high HIV prevalence (4.6%) among female sex workers in Calicut (National AIDS Control Organisation 2007).

In this paper, we hypothesised that the adoption of solicitation strategies involving mobile phones could increase or decrease sex workers' risky sexual behaviours with clients, depending on the way in which the mobile phones are used. Thus, the objectives of this paper were to describe the different types of client solicitation strategies through mobile phones and to examine whether these are associated with higher or lower rates of inconsistent condom use with clients. We assessed the consistency of these associations in two sites, Chirala, Andhra Pradesh and Calicut, Kerala. We also tested whether there was an interaction effect of age with solicitation strategies involving mobile phones. This was based on the rationale that younger sex workers maybe more likely to adopt mobile phone solicitation than older sex workers. A more precise understanding of these relationships may inform future research and interventions that target sex workers who utilise mobile phones for client solicitation and who operate within and outside of central sex work venues.

Methods

Study Overview

This manuscript presents secondary analyses on data from a research project carried out in partnership between the Center for AIDS Prevention Studies at the University of California, San Francisco, the Y.R. Gaitonde Centre for AIDS Research and Education (YRG CARE) in Chennai, SHADOWS in Andhra Pradesh and Shelter in Kerala. The original survey was conducted among 1,139 female sex workers and 1,285 male migrant workers in Chirala, Andhra Pradesh and Calicut, Kerala. The quantitative survey reported in this paper applied a cross-sectional design and was conducted among 1,139 female sex workers in Chirala, Andhra Pradesh (n=589) and Calicut, Kerala (n=550) in South India during 2009 and 2010. Detailed descriptions of the study sites and the original research study can be found elsewhere (Rodriguez et al. 2010; Heravian et al. 2012).

Ethical Considerations when working with Sex Work Populations

A complex set of laws that facilitate hostile legal environments for female sex workers and the high costs of stigmatisation associated with sex work in India required strategies to ensure participants were not exposed to additional harm as a result of the study. The research team incorporated several steps in the study recruitment and data collection process to ensure a high level of confidentiality and inclusion of a broad range of female sex workers. First, local collaborators had established relationships and prior experience working with local sex work communities. Second, a community advisory board, including female sex worker community leaders, were engaged in the development of study goals and protocols. Third, local networks of female sex workers were engaged. This allowed for study outreach to particularly hidden female sex work populations such as home-based sex

workers via sex worker community leaders prior to any involvement of research teams. Fourth, given the cross-sectional nature of the survey, no identifying information was collected and participants were advised of their right to use a pseudonym with the interviewer if so desired. In addition, research teams worked closely with participants to ensure all interviews were conducted in locations where participants felt comfortable and privacy needs were met.

Study Recruitment

Qualitative research directly informed the quantitative survey described in this paper. Specifically, social mapping and key informant interviews yielded identification of cruising locations for female sex workers and provided entry points to access female sex workers directly, as well as brokers, including pimps, brothel managers, vendors and drivers. Respondents in Kerala self-identified into categories representing primary sex work space, including: home, street, lodge and brothel-based. Participants in Andhra Pradesh self-identified as: community, community/street, lodge/street, brothel/street and brothel-based. Non-probability sampling strategies were utilised by research teams, in coordination with sex work community leaders, to ensure representation of all categories of the locally defined sex work typologies.

Inclusion criteria for the study required participants to be 18 or older, to speak the local language (Telugu in Andhra Pradesh and Malayalam in Kerala) or English, to reside within 50 kilometres of Chirala or Calicut, and to have engaged in sex work in the area for at least three months prior to the survey administration, where sex work was defined as exchanging sexually related practices for goods, services and/or money. Informed consent was obtained from eligible participants and a structured face-to-face interview was administered for approximately one hour. Participants were compensated with a token of appreciation worth approximately 3 USD based on recommendations from the community advisory board. Institutional Review Board Approval was granted from the University of California, San Francisco, YRG CARE and the Indian Council of Medical Research.

Measures

Inconsistent condom use with clients—A dichotomous item reflecting self-reported condom use during vaginal sex with clients in the past 30 days was defined as consistent use ('always') and inconsistent use (all other original response options, including 'never').

Age—Participant ages were categorised as 18-24, 25-32, 33-39, and 40 years.

Age at Sexual Debut—Participants reported age at sexual debut and an item was constructed to reflect sexual debut < 16 years vs. 16 years.

Education—An item was constructed to reflect participants who reported primary level of school or less versus secondary level of school or higher.

Performs Non-Sex Work—Participants reported whether they engaged in any work other than sex work at the time of the survey administration.

Lifetime physical violence from clients—A dichotomous item distinguished female sex workers who reported physical violence at any point in their lifetime from those who reported no physical violence at any point in their lifetime.

Recent physical violence from sexual partner—This dichotomised measure reflected frequent actual and threats of extreme physical violence (kicked/dragged, burned/strangled, threatened or attacked with a weapon) by any sexual partner in the previous 12 months, where frequent was defined as ‘often’ or ‘every time’.

Frequency of Sex Work—An item was constructed to reflect high (daily or > once a week), weekly (once a week), and low (monthly or during holiday periods) frequency.

Years of Sex Work—This measure was constructed by subtracting age at the time of survey administration with reported age at sex work debut.

Recent STI infection—Respondents indicated whether or not they had undergone STI testing in the previous three months. Those tested for STIs were asked if they received a positive diagnosis of an STI, other than HIV.

HIV diagnosis—Participants were asked if they had ever been HIV tested, and if yes, whether the test result was positive or negative.

Solicitation Practices—Participants identified all currently used solicitation venues and methods. Places of solicitation were clustered into three categories: public venues (street, park, bus station, beach, cinema, train station), brothels, and home-based venues (participant or friend's residence). Methods of solicitation were classified as: solicitation via brokers (pimps, drivers, family member) and solicitation via mobile phone (exclusive mobile phone solicitation, concurrent sex work venue-based/ mobile phone solicitation and concurrent broker/ mobile phone solicitation).

Statistical Analysis

Univariate analyses were conducted to provide a description of the study sample and to identify patterns of client solicitation by site. Solicitation practices were examined, including the number of solicitation venues and methods reported by female sex workers. Among female sex workers reporting any mobile phone solicitation, combinations of mobile phone use with other methods and venues were examined to identify the most prevalent mobile phone strategies in both sites.

Next, multiple logistic regression models with inconsistent condom use with clients as the outcome, were performed, per site. The main predictor of interest was mobile phone solicitation. The three most prevalent solicitation strategies were included in the logistic regression models and compared to the reference category of no mobile phone solicitation: 1) concurrent mobile phone and venue solicitation, and 2) concurrent mobile phone and broker solicitation and 3) exclusive mobile phone solicitation. Given high levels of overlap in the reported use of venue-based locations (e.g., home, brothel, public solicitation), venue-based solicitation was constructed as one category. Firth logistic regression models were

applied to reduce potential bias of maximum likelihood estimates due to small proportions of inconsistent condom use for some solicitation categories (Heinze and Schemper 2002).

These regression analyses were adjusted for age, education, recent physical violence, and frequency of sex work (Subramanian et al. 2008; Beattie et al. 2010; Swain et al. 2011; Deering et al. 2013). We also included an interaction effect of age with mobile phone-based solicitation practices, based on a rationale that age may modify sex work strategies, including mobile phone solicitation strategies. For all models constructed, p-values < 0.05 were considered statistically significant. Each model met an acceptable standard regarding multicollinearity (variance inflation factor <10) (O'Brien 2007). All statistical analyses were conducted using STATA version 12.1.

Results

A total of 1,139 female sex workers were included in a site-specific analysis to assess the role of mobile phones in sex work solicitation practices in Calicut, Kerala (n = 550) and Chirala, Andhra Pradesh (n = 589). Occupational and demographic characteristics by site are reflected in Table 1.

Among Kerala participants, 83.2% of female sex workers reported engaging in sex work more than once a week and an average of 7 years of sex work. Primary school or a lower education level was reported by 59.4% of the participants; 47% generated income from work other than sex work. With regard to condom use practices, almost half (49%) of the Kerala participants reported inconsistent condom use with clients and 483 (87.8%) reported not testing for STIs, excluding HIV, in the previous three months. Furthermore, more than a third of these participants reported never having had an HIV test. Among the 67 Kerala participants who did report STI testing, 31.3% reported a positive STI diagnosis within the previous three months.

Andhra Pradesh participants reported a mean age of 29, with more than five years spent engaging in sex work, on average. Among these participants, 77% engaged in sex work more than once a week. More than 80% of the participants in Andhra Pradesh reported having a primary or lower level of education (84.5%) and engaging in other income-generating work besides sex work (89.1%).

An examination of sexual risk behaviours among participants in Andhra Pradesh indicated that 36.7% reported recent inconsistent condom use with clients. In total, 57% of these participants reported not having been tested for STIs other than HIV within the previous three months; 4.2% had never been tested for HIV. Among those tested, 88.9% (n = 225) reported a positive STI diagnosis and 6.9% (n = 39) reported being HIV-positive.

Analysis of solicitation practices showed that the majority (54.8%) of participants in Kerala reported a single venue or method of solicitation, with only 11% reporting three or more venues or methods of client solicitation. In contrast, the use of one venue or method of client solicitation was reported by only 22% of participants in Andhra Pradesh, with the majority (55%) identifying use of three or more venues or methods of solicitation.

Mobile phones and sex work: Implications for client solicitation by site

Any form of mobile phone use for client solicitation was reported by 46% (n = 255) and 79% (n = 464) of participants in Kerala and Andhra Pradesh, respectively. Among those reporting use of any form of mobile phone solicitation, three variations emerged as most prevalent in both study sites: solicitation through exclusive use of a mobile phone, mobile phone/broker solicitation, and mobile phone/venue-based solicitation. Proportions of participants reporting use of these strategies and those reporting nonuse of mobile phones for client solicitation are shown in Figure 1.

Mobile phone solicitation and condom use with clients: Risk or protection?

To examine the relationship between mobile phone solicitation strategies and inconsistent condom use among participants in Kerala and Andhra Pradesh, logistic regression models were fitted for each study site. The three most commonly identified mobile phone solicitation strategies (i.e. mobile phone/venue, mobile phone/broker and exclusive solicitation using a mobile phone) were compared with solicitation without the use of a mobile phone. These relationships were assessed adjusting for age, education, recent physical violence and frequency of sex work. The results of these analyses are shown in Table 2, by site.

Among the participants in Kerala (n = 546), those reporting exclusive mobile phone solicitation had significantly higher odds of inconsistent condom use than those who did not report any mobile phone solicitation (OR: 1.72; 95% CI: 1.03–2.87). However, participants who reported venue/ mobile phone solicitation strategies or broker/mobile phone solicitation did not have significantly higher odds than those who did not report any mobile phone solicitation, after adjustment for age, education, frequency of sex work and recent physical violence.

In contrast, participants in Andhra Pradesh (n = 568) who reported exclusive mobile phone solicitation demonstrated lower odds (OR: 0.05; 95% CI: 0.01–0.38) of inconsistent condom use than those who did not report any mobile phone solicitation, after adjustment; a similar result was found among participants reporting broker/mobile phone solicitation (OR: 0.07; 95% CI: 0.01–0.40). However, participants who reported venue/mobile phone solicitation did not demonstrate a statistically significant association with inconsistent condom use with clients in Andhra Pradesh.

A priori interactions between mobile phone solicitation strategies and age were examined by site. These interactions did not yield statistically significant results (not shown).

Discussion

The aim of this research was to examine mobile phone solicitation of clients by female sex workers and to assess associations between mobile phone solicitation and inconsistent condom use with clients in Calicut, Kerala and Chirala, Andhra Pradesh. The findings support our hypothesis that mobile phones provide opportunities for risk and protection in relation to condom use with clients. Specifically, this study identified different mobile phone strategies for client solicitation. We also found associations between these strategies and

consistency of condom use with clients. An unexpected finding was that these associations varied depending on context, where exclusive mobile phone solicitation was associated with riskier condom practices with clients in Kerala and less risky condom practices in Andhra Pradesh. Evidence of independent associations between mobile phone solicitation and condom use with clients highlight the important and underexplored role of mobile phones within current contextual and individual factors affecting a sex worker's decision to use condoms with clients.

The study findings demonstrated that Kerala-based sex workers using mobile phones exclusively to solicit clients had significantly higher odds of inconsistent condom use with clients (OR: 1.72; 95% CI: 1.03–2.87) than those not reporting the use of mobile phones to solicit clients. In contrast, the exclusive use of mobile phones was associated with lower odds of inconsistent condom use with clients among participants in Andhra Pradesh (OR: 0.05; 95% CI: 0.01–0.38). The differences between the two sites could be due to general solicitation strategies and employment in other industries besides sex work.

In Andhra Pradesh, exclusive users of mobile phones reported high rates of nonsex work employment. Hence, this group may be less dependent on sex work for income than exclusive mobile phone sex workers in Kerala and, therefore, have more power to negotiate condom use with clients. In addition, our findings showed that female sex workers in Andhra Pradesh reported a high level of overlap in venues used for client solicitation. The diversity of employment opportunities and of non-sex work related venues used by female sex workers in Andhra Pradesh possibly provide additional opportunities for peer support and knowledge and attitude exchange relating to condom use. In contrast, female sex workers in Kerala largely solicited clients using only one venue or method and reported lower levels of employment in industries other than sex work. This may translate into less exposure to social networks and in turn, less social support for information and attitude exchange or general exposure to diverse attitudes and behaviours relating to condom use. In addition, among Kerala-based participants, economic dependence on sex work may limit their ability to decline risky behaviour when requested to do so by clients who were referred via peers (Buzdugan et al. 2012).

We found venue/mobile phone solicitation did not demonstrate independent associations with condom use in either site. We propose that this type of mobile phone solicitation may serve to increase client numbers and direct access to female sex workers. In addition, we found that broker/ mobile phone solicitation was associated with less risky condom use in Andhra Pradesh, but not in Kerala. Further investigation is required to understand whether this is the result of the small sample size in our study or if there are specific mechanisms contributing to more consistent condom use among sex workers who use mobile phones and brokers for client solicitation in Andhra Pradesh.

These findings highlight the need to take into account the multiple ways in which mobile phones can be employed by female sex workers for solicitation in order to avoid confounded findings on the risks associated with a uniform measure of mobile phones for client solicitation. Furthermore, this study provided evidence of exclusive use of mobile phones for solicitation in both study sites. Given that different solicitation practices were employed

in both sites (e.g. single venue/method solicitation in Kerala versus multiple venue/method solicitation in Andhra Pradesh), it is worth noting that exclusive use of mobile phones for solicitation was reported by more than 10% of the participants in both sites (Andhra Pradesh: 12% [n = 73]; Kerala: 15% [n = 83]). This warrants further investigation, so as to ensure that this potentially growing segment of female sex workers is not systematically excluded from HIV prevention strategies.

As in all cross-sectional studies, causality cannot be inferred from the results of this study. Further limitations of this research include the use of self-reported data, which increases opportunities for biased reporting due to recall problems and/or the provision of socially desirable responses. For example, the reported prevalence of STIs, including HIV, was low among the Kerala sample. However, 88% of the participants in Kerala reported not having been tested for STIs within three months prior to the study. It is possible that the self-reported data regarding STI and HIV were not indicative of the true prevalence. Alternatively, low rates of testing may indicate lack of easy access to STI tests or lack of motivation to get tested regularly. This is consistent with participants' reports of low exposure to HIV programmes at both study sites at the time of the survey. Finally, our sample size was small for the categories of sex workers soliciting exclusively via mobile phone or concurrently via mobile phone and brokers. Additional research is required to examine whether the associations shown in this study hold true elsewhere, including other regions in India and among diverse groups of sex workers.

Conclusion

This study highlights the emerging role of mobile phones in client solicitation by female sex workers in South India. Our findings showed that associations between mobile phone solicitation and condom use with clients are a function of the type of mobile phone solicitation strategy adopted by female sex workers in specific contexts. This suggests that future research should distinguish between different solicitation strategies using mobile phones and examine their associations with condom use with clients. Both qualitative and quantitative research should be used to explore factors explaining the relationship between mobile phone solicitation strategies and inconsistent condom use. Research aimed at identifying reasons for the adoption of specific solicitation strategies using mobile phones would enable an understanding of emerging pathways of sexual health risks and opportunities for sex workers. This knowledge may, in turn, play an important role in incorporating mobile phones into HIV prevention and treatment interventions targeting sex workers in South India.

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Mobile Phone Strategies for Client Solicitation, by Site

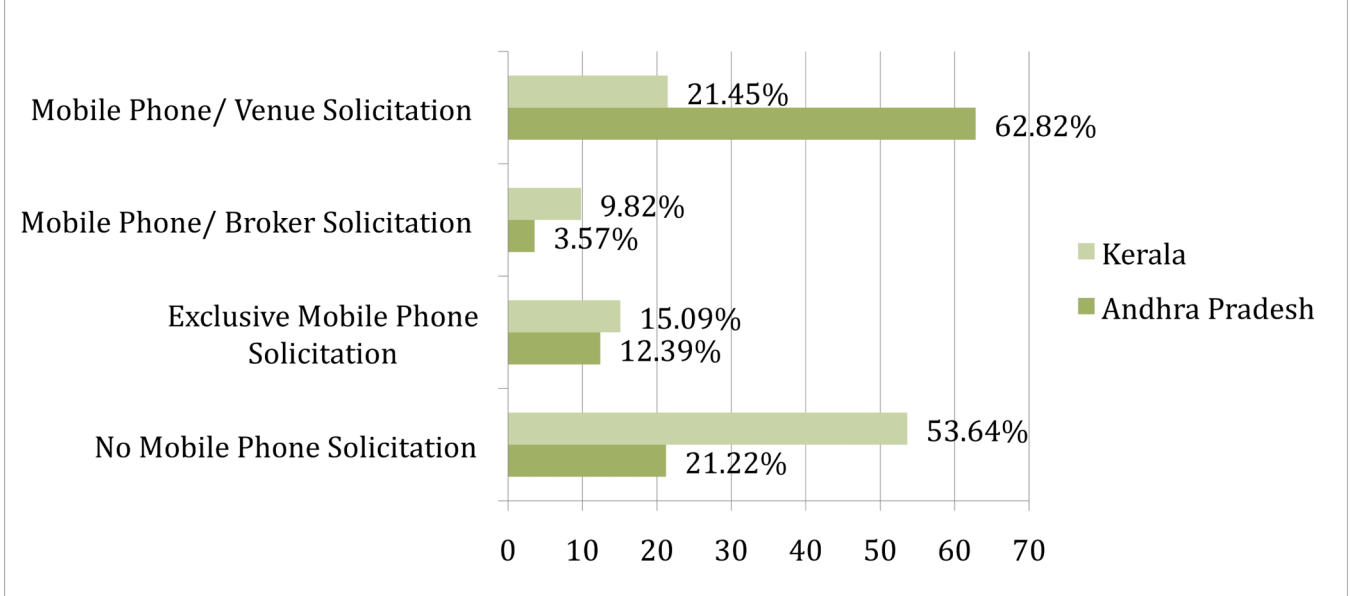


Figure 1.
Mobile Phone Strategies for Client Solicitation, by Site

Table 1

Demographic and occupational profile by site

	Calicut, Kerala (n= 550)	Chirala, Andhra Pradesh (n= 589)
	mean (SD)	mean (SD)
Age in years	29 (4.44)	29 (6.01)
Years of sex work	7.15 (3.78)	5.62 (5.01)
	n (%)	n (%)
Education primary school	327 (59.4)	498 (84.5)
Sexual Debut <16 years of age	132 (24.0)	204 ^a (34.9)
Ever experienced violence from clients	407 (74.0)	435 (73.8)
Physical violence by any sexual partner, past 12 months	136 (24.7)	132 (22.4)
Engagement in sex work > 1×/week	458 (83.2)	453 (76.9)
Performs non-sex work	259 (47.0)	525 (89.1)
Inconsistent condom use with clients, past 30 days	270 (49.0)	216 (36.7)
STI, other than HIV, reported in the past 3 months	not tested: 483 (87.8) tested & negative: 46 (8.4) tested & positive: 21 (3.8)	not tested: 336 (57.0) tested & negative: 28 (4.8) tested & positive: 225 (38.2)
HIV test & status	n=511 ^b never tested: 183 (35.8) tested & negative: 325 (63.6) tested & positive: 3 (0.6)	never tested: 25 (4.2) tested & negative: 525 (89.1) tested & positive: 39 (6.6)

^a 5 missing responses^b 39 missing responses

Table 2

Firth logistic regression models of inconsistent condom use with clients by site

Covariates	Calicut, Kerala (n=546)		Chirala, Andhra Pradesh (n=568)	
	AOR ^a	95% CI ^b	AOR ^a	95% CI ^b
Venue & mobile phone-based solicitation ^c	1.29	0.83-2.01	1.26	0.79-2.00
Broker & mobile phone-based solicitation ^c	1.26	0.70- 2.31	0.07**	0.01-0.40
Exclusive mobile phone-based solicitation ^c	1.72*	1.03-2.87	0.05**	0.01-0.38
Age	1.02	0.98-1.06	0.97	0.94-1.00
Primary education	2.32***	1.62-3.32	0.42**	0.24-0.72
Frequency of sex work	1.50	0.93-2.43	3.58***	1.91-6.74
Recent violence by any sexual partner	0.72	0.51-1.03	2.33***	1.54-3.53

p<0.001**
p<0.01*
p<0.05^a Adjusted Odds Ratio^b 95% Confidence Interval for adjusted odds ratios^c Reference Category: No mobile phone-based solicitation