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A study of Information flow on Sexually Transmitted Infections Treatment Seeking behavior Among Female Sex Workers in Chennai City: - A Social Network Approach

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ABSTRACT

Background: Adherence to periodical screening for sexually transmitted infection among female sex works is a major concern. Here, studies says that Tamilnadu's state female sex workers have obtained high STIs awareness and treatment seeking behavior for the self-identified sexually transmitted Infection. Though there is a high level of STIs awareness, 30.9% of FSW had at least 1 symptom of STI. This indicates that there is a lack of treatment seeking behavior and safe sex practice. The purpose of this study was to identify the individual FSW who plays a central role in STI treatment seeking behavior.

Objective: The objectives of the present study is to map the existing networks of FSWs, identification of influential individual or key nodes within the network who facilitate Information flow on treatment seeking behavior by using social networks analysis

Method: Structured questioner was used for interview female sex worker using exponential snowball method to measure the social relationship for STI treatment seeking, motivated and accompanied for STI screening. And identified the central node for treatment seeking behavior using in - degree and page rank of sociometric measures of social network analysis.

Findings: A list of 152 FSWs social relationships mapped and analyzed the values of in-degree, page rank for above said activities. Out of this 152 FSWs, 26 FSWs had overall page rank value greater than two and 6 FSWs were having more than page rank three. This shows that information flows higher through this individual 26 FSWs compare to other. As this FSWs are indirect contact with 44 FSWs among the overall 152 FSW.

Conclusion: The findings of this study establish that SNA could be tried out for mapping the network and central node by identifying the vital 26 FSWs for strengthening the periodical STI screening. This study, however, suggests that such analysis may help us to understand information flow for STI treatment seeking behavior and conceptualize self-reported infection. FSWs who weren't directly into the implementation of STI screening program has contributed significantly. Thus, utilizing these 26 FSWs as a positive speaker would strengthen peridodical STI screening among FSWs.

KEYWORDS:

Introduction: Adherence to periodical HIV testing and screening for sexually transmitted infection among female sex works is a major concern. Whereas, only a small percentage of female sex workers adhere to the screening process. Female sex workers are naturally networked together as a group for in their sex work settings, which facilitate client recruitment, development of collective identity and social capital, among them.1. We undertook a network based study to visualize the information flow on sexually transmitted infection treatment seeking behavior among female sex workers of Chennai city with regard to their treatment seeking behavior National Integrated Biological and Behaviour Surveillance study has reported that even though 88% of Female sex workers of Tamilnadu State were aware of STIs, 31% were still infected. This indicates that though there is a high awareness of STI among FSWs there is a low level of safer sex practice which is reflected in the higher STI infection[2.]

Objective

The objectives of the present study is to map the existing networks of FSWs, identification of influential individual or key nodes within the network who facilitate Information flow on treatment seeking behavior by using social networks analysis

Methodology

Female sex works who are currently involved in transaction sex and being a resident of Chennai city were included in this study. Researchers administrated structured questionnaire which inquired about their network members have provided information related to treatment seeking, and who have motivated and accompanied them for accessing treatment.

A sample of 152 FSWs was identified using exponential snowball sampling method8. Network centrality measures like In-Degree and Page Rank were used for identifying the influential individuals (Central nodes) based on the above said three factors5. In- Degree identifies the influential FSW and Page rank identifies the individuals who are well connected within the network. SNA assumes that higher the In-degree and page rank values more the influential person. 3,4

Ethical

The ethical committee of SRM University has approved this study. The

study population was properly explained about the purpose of the study and their verbal inform consent was obtained. Unique Identification number has been provided to all the study population in order to maintain anonymity.

Network Analysis of Information flow

Data collected were entered into Node XL software (version 1.0.1.92) for analyzing the networks based on values of in degree and page rank. Harel–Koren fast multiscale was used to measure these network centralities7. These centrality measures identified individual FSWs who are responsible for the spread of information flow on STI treatment seeking behavior6 and also identifies FSWs who had overall highest connectivity with other members in the network3,4 This implies that FSW with maximum values of page rank and in -degree represents that individual who has played a vital role5 in treatment seeking activities and they should be recognized for their important social role in motivating other FSWs for STI treatment.

Results

One hundred and fifty-two FSWs were included for their study and their social network reflecting their social relationships were listed mapped and analyzed for determining the values of in-degree, page rank through the above described STI treatment seeking behavior activities. Therefore, FSWs with more than two in-degree and more than one in page rank values were conceptualized as a vital player in the Network. Out of this 152 interviewed FSWs, 26 of them had overall page rank values > 2. (Table: 1). Out of these 26 FSWs, only six of them had greater than value >3 among these six, two are home-based sex workers and four were street-based sex workers.

Table: 1 Provides over all the socio metric value of all three activities

UID	In-Degree	PageRank
151	4	4
72	0	3
141	0	3
58	3	3
7	1	3
63	1	3
73	0	3

126	2	3
43	0	3
139	0	3
5	2	3
71	1	3
103	1	3
147	1	3
121	0	3
140	1	3
64	0	3
27	0	3
118	0	2
107	0	2
124	0	2
111	0	2
120	0	2
133	0	2
25	0	2
132	0	2

Pic: 1The sociogram generated indicates that these six FSWs can reach 44 other FSWs in the network directly. Also, there were another 20 FSWs can reach 121 sex workers in their network directly. This important result indicates that to concentrate the entire sample of 152 we can take the service of these 26 people for promoting information flow regarding treatment easily. Similarly, all three STI treatment seeking behavioral activities of this study were analyzed to assess which FSWs has the high connectivity of information flow.

Social media network connections
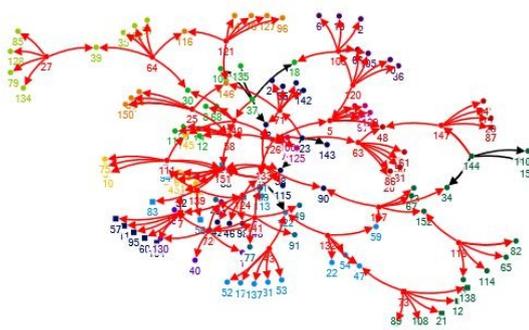
Created with NodeXL Basic (http://nodexl.codeplex.com) from the Social Media Research Foundation (http://www.smrfoundation.org)

P   Pic:1 Sociogram of overall FSW Network

STI treatment seeking act 77 FSWs were reported based on their sociometric value analyses. Among this 77 FSWs, thirty had sought information from other and 53 FSWs had provided information to other FSWs in the network. Here, Table: 2 shows, four FSWs (UID-77, 15, 29 &75) has got more than one in –degree, UID-77 had high page rank in relation to the all three activities.

Table: 2 Provides the socio metric value of STI treatment seeking behavior

UID	In-Degree	PageRank
77	3	2.4
15	2	1.1
29	2	1.1
75	2	1.1

Pic: 2 Sociogram provides the information flow in the network in relation to STI treatment seeking behavior.

Created with NodeXL (http://nodexl.codeplex.com)
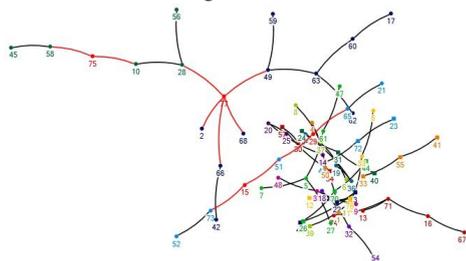
Pic:2 Sociogram of FSW's STI treatment seeking network

Table: 3 provides sociometric values for 73 FSWs network who were motivated for STI screening. Two FSWs had scored higher page rank (UID-72 &24), whereas, 7 FSWs (UID-12, 22, 72, 24,2,56 &18) had more than 2 In-degree.

Table: 3 Provides the socio metric value of motivated for STI screening

UID	In-Degree	PageRank
12	3	1.49
22	3	1.36
72	2	2.18
24	2	2.01
2	2	1.82
56	2	1.20
18	2	1.08

Pic: 3 Illustrate the sociogram of FSW's who were motivated for STI screening through networks.

Created with NodeXL (http://nodexl.codeplex.com)
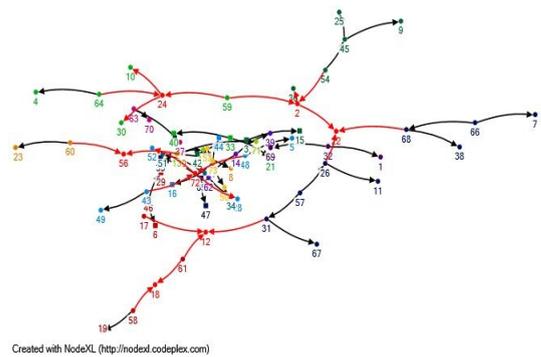
Pic:3 Sociogram of FSW network for motivated STI screening

Table: 4 shows that 81 FSWs in the network had accompanied another FSWs during their STI clinic visit. Only one FSW has got a page rank of more than 2 (UID-63) and two FSWs had more than one. There were only three FSWs (UID-63, 40 &50) had more than two in-degree

Table: 4 Provides the socio metric value of motivated for STI screening

UID	In-Degree	PageRank
63	2	2.2
44	2	1.2
50	2	1.2

And Pic: 4 Illustrate the sociogram of FSWs who accompanied another FSWs for STI.

Created with NodeXL (http://nodexl.codeplex.com)
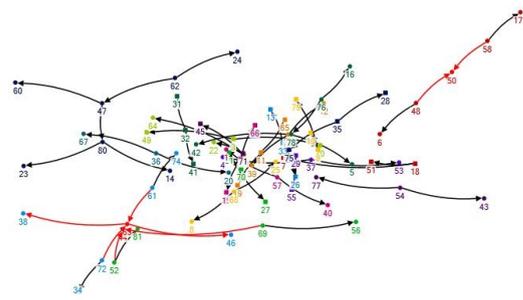
Pic:4 Sociogram of FSW accompanied for STI Screening

This study successfully traced indirectly the information flow for STI treatment seeking behavior among FSWs using social network analysis. The existing STI screening focuses the contact mapping of peer and their service delivery gap through an individual service delivery tracking system.(3) Since there are various external factors involved in accessing STI screening and keeping up the behavior even in the presence of various barrier in accessing STI screening. Whereas, application of SNA has identified the existence of information flow and active player for STI treatment seeking behavior. By involving the central node even in the presence of external barrier would overcome

the hindrance. Thus, SNA approach should be a cost-effective methodology to improve the STI treatment seeking behavior among FSW.

Discussion

This study has mapped and identified the central node of FSWs using social network analysis based on their STI treatment seeking behavior activities like Seek information for STI, motivated and accompanied for STI screening. The findings of this study establish that SNA could be tried out for mapping the network and central node for strengthening the periodical STI screening. This important result indicates that to concentrate the entire sample of 152 we can take the service of these 26 people for promoting information flow regarding treatment easily. Though Identification of FSWs in the initial stage is a major struggle, this is the main drawback of this study. Also, this kind of study fully depends on self-reported statements of the elusive population. This study, however, suggests that such analysis may help us to understand the information flow for STI treatment seeking behavior and conceptualize self-reported infection.

Conclusion:

The primary objective of the study is to map the existing networks, identification of central node (Individual) in Information flow on STIs treatment seeking behavior in the social networks of female sex works in Chennai city.

In-degree and Page rank centrality measure was used to assess the information flow for STI treatment seeking behavior based on the assumption that higher the page rank and in-degree values, greater the information flow rates. The identification process was started initially with 1 street-based FSWs and their immediate contacts of 152 FSWs through exponential snowball sampling method. The open source software Node XL was used for analyzing the information flow9. Among this 152 FSWs who has scored more than page rank two and three in-degree value greater than 3 should follow up for engaging them as a positive speaker for improving STI screening through strengthening the information flow. Thus, SNA approach should be a cost-effective methodology to improve the STI treatment seeking behavior among FSW.

Limitation:

The main limitation of this kind of study is the inability of mobilizing the new FSWs for one to one interview due to the fear of disclosure of status, especially among home-based sex workers.

Acknowledgements

List of Abbreviation
HIV- Human Immunodeficiency Virus
NIE-National Institute of Epidemiology
NACO- National AIDS control Society
IBBS- Integrated Biological and Behavioral Surveillance
UID- Unique Identification
STI- Sexually Transmitted infection
FSW- Female Sex worker
SNA- Social Network Analysis

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