A Game-Based Intervention To Improve Youth Sexual And Reproductive Health In New Delhi, India

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INTRODUCTION

Games have been used to teach a variety of health topics in an array of settings (Macklin, Jagoda, Jones, & Gilliam, 2018). Games are a useful learning tool because they are play-based, engaging, motivating, and empowering to learners (de Freitas, 2018). Building on our previous experiences designing and studying board games for health education with adolescents in the United States (Melissa Gilliam et al., 2018; Melissa Gilliam et al., 2016; M. Gilliam, Jagoda, Heathcock, & Sutherland, 2014; Macklin et al., 2018), this project tested the feasibility, acceptability, and efficacy of two games on sexual and reproductive health (SRH) with Indian youth.

METHODS

Recruitment:

Through community partnerships, we recruited youth ages 15-24 living in urban slums of New Delhi, India, to participate in a three-day SRH workshop. Workshop content included one storytelling game on birth control and one trivia game about sexually transmitted infections (STIs). The birth control game also had an associated curriculum-based component to ensure that desired messages were emphasized as the gameplay style offered minimal control over informational content.

Games

The two games were Hindi translations of the games Clinic Quest and Hearsay, which were initially prototyped by Chicago high school students participating in Hexacago Health Academy, a participatory design program that engaged adolescents on STEM and sexual and reproductive health issues through game design (Macklin et al., 2018). These initial prototypes were refined by professional game designers into Clinic Quest and Hearsay. Clinic Quest is a trivia-style game about common STIs and Hearsay is a storytelling game that incorporates family planning/birth control (BC) information.

Measurement

Pre- and post-test instruments were created for both games to assess relevant knowledge, attitudes, and behavioral intentions before and after gameplay (after gameplay + curriculum for Hearsay).

Analysis

Pre/posttest changes were assessed using appropriate nonparametric tests due to the sample size and nonrandom sample selection (primarily Wilcoxon sign-ranked tests for continuous variables and McNemar's test for binary variables). Because pre and post surveys assessed a battery of constructs, Holm-Bonferroni corrections were also performed on non-index variables to minimize Type I error with a significance level of p<.05.

LIMITATIONS

Limitations include short follow-up time, small sample, and lack of control group. Additionally, as Hearsay was assessed with a curriculum, this pilot did not assess the impacts of the game by itself.

CONCLUSIONS

Results indicate effectiveness, as well as acceptability and feasibility, of two sexual and reproductive health games as educational tools for Indian youth. Findings suggest that these games are particularly suited for the delivery of essential sexual health knowledge.

ACKNOWLEDGEMENTS

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CITATIONS:

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2. Gilliam, M., Hill, B. J., Jaworski, E., Sparrow, A., Jones, I. B., & Jagoda, P. (2018). Increasing Anti-tobacco Industry Attitudes Among Youth: A Pilot Study of a Multiplayer Educational Board Game. Games for health journal.
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RESULTS

Sample

Most of the sample (n = 20, 64.5%) was aged 15-19. Sample was split between female (n = 16, 51.6%) and male (n = 15, 48.4%) participants. Most of the sample had completed either middle school (n = 10, 33.3%) or high school (n = 14, 46.7%). About a third (n=10, 32.2%) were married, while 13 (41.9%) had been sexually active. Six participants (19.4%) were currently using a birth control method.

Hearsay Efficacy, Feasibility, and Acceptability

The Hearsay program (game + curriculum) significantly increased condom knowledge and general pregnancy prevention knowledge as measured by indices. After Holm-Bonferroni correction, the Hearsay program significantly shifted attitudes about the appropriateness of discussing AIDs and discussing condoms; self-reported knowledge of several birth control methods; and objective knowledge of injectables and abortion as measured by single true/false questions. Pre and post-test results are explored in more detail in Table 1 and in Fig. 1.

Table 1. Hearsay Results

Knowledge - Indices	Pre-test mean	Post-test mean	p-value*
Condom Index (7 items)	3.19	6.33	0.00001
Pregnancy Index (6 items)	1.84	3.38	0.00041
Knowledge – Individual True/False	Correct at pretest (%)	Correct at posttest (%)	p-value (unadjusted)
Negative effects from birth control injections can last a woman's entire life.	19.40	82.8	0.00001**
Long-acting birth control cannot be removed early.	16.70	48.3	0.057
Anyone over the age of 18 can get an abortion in India.	25.80	83.3	0.000015**
Knowledge of BC Methods – Self-Report	Know about at pretest (%)	Know about at posttest (%)	p-value (unadjusted)
Rhythm method	16.1	93.3	0.00000024**
Withdrawal	38.7	60.0	0.092
Oral contraception	48.4	100.0	0.00001**
Condoms	86.7	96.7	0.375
Injections	32.3	96.7	0.000004**
Intra-Uterine Device (IUD)	43.3	93.3	0.000061**
Emergency Contraception	33.3	96.7	0.000008**
Abortion	67.7	96.7	0.004
Sterilization	71.0	96.7	0.008
Abstinence	56.7	90.0	0.013
Attitudes (1-5, 5 = strongly disagree)	Pre-test mean	Post-test mean	p-value (unadjusted)
It is too much of a hassle to use a condom every time you have sex	3.74	4.13	0.061
It doesn't matter whether you use birth control or not; when it is time to get pregnant, it will happen	3.55	4.47	0.007
It is mainly a woman's responsibility to make decisions about birth control	4	4.37	0.115
A woman should be a virgin when she marries.	2.52	3.07	0.106
It is immoral for a woman to seek pleasure in sex.	3.55	4.3	0.027
It is wrong to talk about AIDs in a good family.	2.87	4.23	0.0007**
It is not proper for a good person to talk about condoms.	3.37	4.33	0.0005**
Easy access to condoms increases promiscuity.	2.23	3.37	0.0079
Sex education increases sexual activity.	3.52	4.17	0.028
Behavioral Intentions (1-5, 5 = most likely)	Pre-test mean	Post-test mean	p-value (unadjusted)
Intent of using birth control at next sex	3.67	4.13	0.023
Intent of using condom at next sex	3.74	4.3	0.016

**No Holm-Bonferroni correction necessary for indices*
***Remains significant at .05 level after Holm-Bonferroni correction*

Hearsay was acceptable and feasible with this group. Eighty-three percent of the sample rated the game as excellent and the remainder as good or okay. All youth reported that the game made the information in the overall program (which included a curriculum) easier to understand. Specific results can be seen in in Fig 2.

Clinic Quest Efficacy, Acceptability, and Feasibility

Clinic Quest (game only, no curriculum) significantly improved scores on an HIV knowledge index and a short (2-item) bacterial vaginosis knowledge index. After Holm-Bonferroni correction, Clinic Quest also significantly improved knowledge on three individual true/false questions on individual STIs. Clinic Quest had no significant impact on any behavioral intentions or on a general STI knowledge index. More specific results can be seen in Fig. 3 and in Table 2.

Table 2. Clinic Quest Results

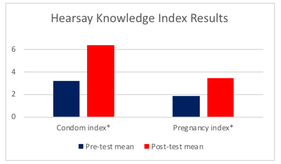
Knowledge - Indices	Pre-test mean	Post-test mean	p-value*
HIV knowledge index (10 items)	5.29	6.34	.0052
General STI knowledge index (8 items)	4.64	4.83	.823
Bacterial Vaginosis knowledge index (2 items)	.21	1.07	.000048
Knowledge – Individual True/False	Correct at pretest (%)	Correct at posttest (%)	p-value (unadjusted)
Gonorrhea can be cured.	10.3	70	0.00014**
There is a cure for Chlamydia.	10.3	76.7	0.00004**
Syphilis can cause blindness.	3.6	70	0.00002**
HPV cannot be cured.	6.9	43.3	0.012
Behavioral Intentions (1-5, 5 = very likely)	Pre-test mean	Post-test mean	p-value (unadjusted)
HIV test in the next 6 months	3.03	2.87	0.564
Other STD test next 6 months	2.93	2.97	0.778
Condom intentions at next sex	4.07	3.90	0.293
Talking to partner about STD testing	3.86	3.90	0.865
Talking to doctor about STD prevention	4.10	3.73	0.116

**No Holm-Bonferroni correction necessary for indices*
***Remains significant at .05 level after Holm-Bonferroni correction*

Clinic Quest was also acceptable and feasible with this group. Most youth agreed that the game was easy to use, original, engaging, and interesting, and that it provided them with useful information. Ninety-three percent of the sample would play the game outside of a research setting, and 90% would recommend the game to others.

Additional results can be seen in Fig 4.

Fig. 1



**significant at the p<.0005 level*

Fig. 2

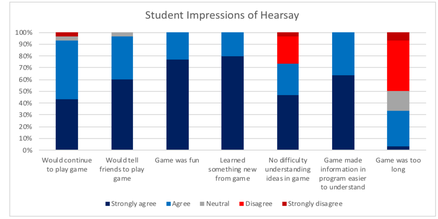
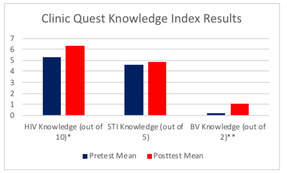


Fig. 3



**significant at the p<.01 level*
***significant at the p<.00005 level*

Fig. 4