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Research Article

Is Facebook Effective in Preventing HIV/STDs in Scholarized Adolescents? A Cluster Rct

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Abstract

Background: In Italy less than 60% of adolescents have a comprehensive knowledge on HIV/AIDS. Generally, there is an overestimation of the subjectively perceived knowledge on items related to AIDS that may have considerable implications on risk taking.

Purpose: The aim of this study was to evaluate a Facebook program on HIV and STDs prevention targeting a group of students attending high schools.

Design: The study implemented a "cluster randomized trial" design with two groups of classrooms: one received an educational intervention on Facebook and the second (control group) received no intervention.

Setting Participants: The sample included 405 students of aged 17.16 classrooms (265 students) participated in the intervention group and 8 classrooms (n=145) in the control group.

Intervention: The intervention lasted one month. Both intervention and control groups completed an anonymous questionnaire before and after the intervention.

Main Outcome Measures: A global index of knowledge on HIV/STD Prevention was measured in both intervention and control group.

Results: An increased level of knowledge was reported in both intervention and control groups. But the increase was significantly higher in the intervention cluster +7.1% than in the control one 1.8% (difference +5.3 two tailed p=0,0006).

Risk-Behaviors did not significantly change after the intervention, probably due to the short time-lag between intervention and evaluation.

Among the intervention group, at individual level, knowledge increased proportionally with the level of participation: + 6.2 among "low participants" and +9.3 among "intensive" participants.

Conclusion: Facebook intervention on the prevention of HIV / STDs for adolescents seems to be effective in improving the level of knowledge, feasible and has got a good appreciation by participants.

Key Points:

What is already known?

1. Risk knowledge on HIV is very poor in European adolescents.

2. Social Networks are widely used but their effectiveness in health promotion for HIV / STD prevention is unknown.

What this paper adds

1. Use of a structured Facebook educational program is effective in improving student's knowledge on HIV prevention.

2. Social Network health promotion is promising and feasible by a public health institution.

Keywords: HIV/AIDS; Social networks; Health promotion; Effectiveness; Adolescents

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Introduction

According to the UNAIDS global Report 2011, less than 60% of adolescents in Europe have a comprehensive knowledge on HIV/AIDS. Generally, there is an overestimation of the subjectively perceived knowledge on items related to AIDS that may have considerable implications on risk behaviors of adolescents. Although, even if sex education programs have a modest impact on behaviors, such effects could be important at a population level if the programs were largely scaled up [1]. Web 2.0 and social networking could be useful tools to scale up and reach large segments of the population. Using social media for promoting health behaviors among young people could be an important opportunity if educational programs are responding to specific needs, program contents are interesting and their presentation is attractive. Public Health organizations working in health promotion could exploit the interaction and the exponential growth of contacts (viral spread) typical of social networks [2] to enhance correct lifestyles among young generations.

Worldwide, the penetration of Web 2.0 applications, and especially social networking sites, has been growing. Among social networking sites, Facebook is the most widely diffused with 552 million daily active users and 955 million monthly active users at the end of June 2012. In our country, there are about 22 million Facebook users, representing the 73.1% of the online population (Social bakers, 2012), and 13% of people aged 13-17. Facebook is the preferred social network of Italian teenagers. In the age group of 12-18, Facebook is used by 85.6% of the population and about 30.8% have more than 500 Facebook friends. 68.8% of teenagers use Facebook every day: 32.2% for 1-2 hours, 14.4% from 2-5 hours and 3.9% more than 5 hours a day.

Thus, a health intervention based on Facebook could certainly offer high reach, but it could also be cost-effective, as the utilization of built-in features allows time and money savings in the management of the intervention. For example, Facebook provides a set of interactive tools (surveys, polls, events, videos, links, tags, educational games, chatting with specialists, case studies, etc.) to enhance and articulate interventions customized and tailored to individual's needs. Moreover, students can interact and play an active role by posting contents and providing feedback. Furthermore, the co-creation of content through the involvement of the target audience in various activities could leverage the workload of health professionals and create an environment that better meets the needs of the population.

While the potential of Facebook and other Web 2.0 and social networking sites can be effective for promoting health particularly HIV/STD prevention, the data supporting this hypothesis are not yet clear although a recent cluster randomized trial on social media-delivered sexual health intervention [3] showed to be effective in improving the use of condoms:. Some studies show that blogging and watching online videos are associated with better outcomes in class performance and education [4-6]. Few studies discuss the need of skill development and training for health personnel involved in the development and implementation of these programs [7-10].

The aim of this study was to evaluate a HIV/AIDS and STD prevention program delivered on Facebook. The program targeted a group of teenaged students attending high schools and "professional-technical" schools (i.e., a practical and work oriented secondary school in the Italian system) in the province of Bergamo. We were interested in both summative and process outcomes, of both participants of the program as well as public health officials who developed and implemented the program.

The study aimed to answer the following research questions

1) Can a public health program addressed to adolescents on Facebook be effective in enhancing comprehensive and correct knowledge on HIV/AIDS and STD as well as HIV and STD risk behaviors?

2) Would users of an HIV/AIDS and STD prevention program delivered on Facebook like receiving and participating in such a program using this channel?

3) Could such a program could be feasible for a Public Health institution?

Methods

Design

To evaluate the effectiveness of the Facebook intervention at increasing knowledge on HIV/AIDS/STDs as a determinant of risky sexual behaviors, the study implemented a "cluster randomized trial" design with two groups of classrooms: one received an educational intervention on Facebook and the second (control group) received no intervention. Cluster randomization was performed at classroom level, so that the risk of bias due to potential information exchanges among participants from same classroom was reduced. 30 classes were identified, 16 classes were randomly assigned in the intervention group and 12 in the control group, (4 classes in the control group dropped after randomization and did not fulfill the initial questionnaire). The final analysis was performed in 16 intervention classes and 8 control classes.

Randomization of classes was performed with Epi (Table 1) program, by generating random numbers list. The intervention was not blind; searchers knew the classes' allocation.

Participants and procedures

The sample included classrooms from three secondary schools in Bergamo. The project was presented to students by an expert psychologist on adolescent issues and Social Networks. Students were invited to participate and to complete the baseline questionnaire. They all agreed to follow a "code of behavior" policy. Randomized students to the intervention group had to accept an invitation (in Facebook) to access the program.

Facebook educational program

The intervention was followed by a multidisciplinary Pedagogical team composed by a medical doctor a psychologist, and an educator The intervention was performed using a "closed group" in Facebook, so only students from randomized classes were allowed to participate. The duration of the intervention lasted one month. The activities were carried out mainly in the afternoon and evening. Facebook resources, including private chat, private contact of the students with the Pedagogical team, "listening space" were given by the team psychologist. The program's learning objectives were identified

Table 1: Sample baseline descriptive at pre-intervention and at individual level.

	Intervention group	Control group	p value (2-sided Fisher's exact)
Responders at pre-intervention questionnaire (clusters and students)	16 cluster (260 students)	8 cluster (145 students)	
Age (average and c.i. 95%)	17.6 (17.4 - 17.7)	17.7 (17.5 - 17.9)	NS
Female (% and n of students)	27.3% (71 students)	22.1% (32 students)	NS
High school (clusters and students)	6 cluster (37,5%) 118 students (45.4%)	3 cluster (37,5%) 51 students (35.2%)	NS 0.046
Global Index of Knowledge on HIV/AIDS before intervention (% corrects answers at baseline questionnaire)	53.4 (95%CI: 51.2 - 55.6)	52.0 (95%CI: 47.8 - 56.2)	NS

through the responses to the "before intervention" – questionnaire: To reduce the belief that the HIV infection is evidenced by physical symptoms; To increase awareness of the HIV-lab test utility and the knowledge of the possibility of HIV-transmission during the "window period"; To increase knowledge on the ways of transmission of the HIV/STDs; To increase knowledge on birth control pills and HIV/STD transmission and enhancing knowledge on the use of condom for contraception and STDs prevention; To increase awareness that oral and anal sex are potentially "at risk behaviors" and the protective role of condom; To increase knowledge on drug therapy and the need to start promptly the treatment; To increase the habit of ready availability of condom, particularly in socialization context like disco, first appointments, school trips; To increase risk-awareness of STDs transmission also with 'trusted partners' To increase risk-awareness of unprotected sexual intercourses under alcohol or drugs; To raise awareness of condom use to protect sexual partners; To reduce risky situations as the refusal of condom by sexual partners and stimulate the adoption of correct behaviors.

Each learning objective of the intervention corresponded to an educational module.

The methodology was performed by a "Socratic approach" questioning students, delivering constant stimuli such as "What do you think …", "What would you answer…?", "How would you deal with….?" and adopted a strategy of using more questions than answers. The Pedagogical team provided a synthesis at the end of each "educational module" and monitored emerging needs not previously identified by questionnaires producing specific act ivies on new issues.

The Pedagogical Team interacted with study participants using a common profile on Facebook, "Project Team". However, each member signed any uploaded content with his/her own real name. Participants interacted in the program using their own profile following an approved code of behavior. The transition to a new module took place with new posts or new activities proposed by the pedagogical team. During the same day more topics to stimulate interest and interaction of the students were posted.

Both intervention and control groups completed an anonymous, self-administered questionnaire before (baseline) and after (post-test) the intervention. The baseline survey was assessed 1 month before the intervention, whereas the second was administered a month after the end of the intervention (for time limits in school agenda). The results of the baseline questionnaire were used to design the intervention pedagogical objectives and activities, considering teenagers' information needs about prevention including knowledge and related risk behaviors. The baseline survey included 54 items assessing knowledge and behaviors related to HIV/AIDS and STD transmission, prevention, risks, stigma, therapy, laboratory testing.

Participation

In order to better understand the pedagogical process, the level of participation was assessed in individuals of the intervention group. Students were classified as high, low, or non-participant on the basis of their reported level of participation. We considered as high participation students those who actively participated in writing posts or comments; Low participation for those who did not participate in writing posts or comments but that followed the discussions reading always or sometimes; Non participation for those who stated that they did not write or read any program information on Facebook, they were anyway included in the analysis (ITT).

Knowledge and behaviors

Knowledge about HIV/AIDS and STDs was measured through 34 items, including transmission, prevention, laboratory testing, and symptoms. Knowledge data were synthesized using a global index of knowledge (GIK), calculated as a percentage of correct answers.

Risk behaviors related to HIV/AIDS/STDs were assessed through 12 items. These questions were about sexual behaviors, number of partners and sex practice under alcohol or illicit drug, use of condom.

Program satisfaction

Program satisfaction was measured using one specific items in post-test questionnaires.

Data analysis

Data were analyzed using STATA version 10. The analysis was performed as Intention To Treat (all students in intervention group were considered either or not using Facebook.) The analysis was performed at Cluster level using mean value for the global index of knowledge for each a classroom. Reported analyses assume an alpha level of.05 and power of .80.

Differences in pre-post-test knowledge were tested using T-Tests. An individual analysis was also performed to understand the level of participation in the intervention (high vs. low vs. non-participation).

Results

Sample descriptive

Twenty eight classrooms were randomized but finally, only 24 classrooms participated and fulfilled before-intervention questionnaires. 4 classrooms withdrew their participation after being randomly allocated to the control group. After baseline assessment, the total sample included 405 students; 265 answered to the pre test questionnaire in the intervention group and 140 in the control group. The post-test survey was completed by 257 students in the intervention group and 123 in the control.

Of the 265 participants assigned to the intervention group, 208 really took part in the educational intervention. The remaining 57, although randomized to the Facebook intervention group but non participants, were included in the analyses as the plan was an Intention to Treat Analysis.

At individual level, age was comparable between the clusters of two groups and there were no significant differences with regards to risk behaviors, such as unprotected sex, sex under the influence of alcohol, illicit drugs, or with partners met on the Internet. The data of the questionnaires show that eight students had no internet access, 45 had no FB-profile. Despite being a minority in both groups, the proportion of students without access to the internet or without FB profile were significantly higher in the control group.

Participation

201 (78.8%) students belonging to the intervention group (n=257 responders to the post questionnaire) participated reading or posting. 87 students (33.9%) interacted actively in the FB group with at least one activity. 114 (44.4%) refer to regularly or sometimes read the discussions on the FB group although they had never posted personally (low participants) 56 (21.7%) did not participate and 3 students (1.1%) did not declare their level of participation in the Facebook group.

All available Facebook resources were used by the intervention group, but the most common activities were text (45%) and the "like" feature (53%).

Knowledge

At a cluster level, the main result is an increase in level of correct knowledge (Global Index of Knowledge) that was reported in both intervention and control groups (Table 2). The increase of GIK was significantly greater in the intervention group (+7.1) than in the control group (+1.8). (Difference +5.3 two tailed P=0,006).

Regarding the intervention group, at individual level, the final knowledge increased proportionally with the level of participation: +6.2 among" low participants" and +9.3 among "intensive participants."

Behaviors

Risk-behaviors did not significantly change from baseline to post intervention, obviously behavior changes were not expected because the time from intervention to measure was very short.

Satisfaction

57% of the participating students rated the intervention as very interesting, 38% as relatively interesting and 5% rated it as not interesting. (The customer satisfaction is higher in the individuals with greater participation).

Discussion

The intervention made by a pedagogically active approach was effective in improving the level of knowledge on HIV and STD in the intervention group resulting in an average increase of 13.3% of the initial global index of knowledge compared to 3.5% (NS) in the control group. Knowledge in HIV prevention is a key issue, absence of knowledge may have considerable implications on risk taking.

The effectiveness of the intervention was increasing with the degree of engagement in the FB group: the more actively participants were engaged (by writing posts or comments) the higher was the increase in the knowledge index. The increase of knowledge index in the control group may be attributable to the pre-questionnaire.

Concerning the public health potential impact, the population coverage is really relevant 78.8% of students invited students participated to the FB intervention.

This study in our opinion, adds to research, a new knowledge on the effectiveness of pedagogical intervention in health promotion using Facebook. The most important issue for future research is to measure the effectiveness of FB intervention in risk behaviors change in Italian cultural contents. Another important issue to investigate is to understand to which number of students we can extended the FB

Table 2: Global Index of Knowledge before and after intervention and difference in increment of score by group.

		before	after	Score increment before / after (CI95%)	p value
Group	n. of clusters	Average score (CI95%)	Average score (CI95%)		
Intervention Group	16 (260 students)	53.4 (51.2 - 55.6)	60.5 (57.5 - 63.5)	+ 7.1 (5.4 - 8.7)	<0.05
Control Group	8 (145 students)	52.0 (47.8 - 56.2)	53.8 (47.9 - 59.7)	+ 1.8 (- 0.6 - 4.3)	NS
Difference				+ 5.3 (2.5 - 7.9)	0.0006 Two tailed 0.0003 One tailed
difference = mean (Intervention group) – mean (Control group) Two-sample t test with equal variances; Ho: diff = 0 t = -3.9938 degrees of freedom = 22					

proposal keeping the activity useful and effective, assuming that the interaction levels remain similar to those reported in this paper.

Limitations

The main limitation of the study was the need to ensure the anonymity of the student in fulfilling the questionnaires, which limited the ability to perform specific statistical analyses. Another limitation was the refusal to be involved in the study by some classes after randomization process, which generated some differences in the basic conditions in the two groups of the study. In such studies field problems are probably common, but we rarely talk about it in research, control groups are challenging in some public health environments. We should circumvent the issue of a classroom involved in a study as a control but willing to be involved in the intervention. In the future studies we should think some possible solution in the study design, like for example, sampling the school and not the class, in order also to minimize exchange of information among participants and the control group.

Conclusions

The educational intervention using Facebook on the prevention of HIV / STDs for 15-18 years olds adolescents was effective on knowledge improvement, feasible and appreciated.

The "resources consuming" of the intervention is certainly of interest considering the little investment of resources and the number of end users joined compared to the time needed to reach classrooms physically.

A multidisciplinary team of 4-5 people can handle a FB-mediated intervention lasting a month with a group of 265 students without over-burdening work (1-2 hours a day by professional or even less), as the main need, while pedagogical materials are ready, is to check often post and to respond quickly, particularly during the afternoon hours and the evening.

The pedagogical style used was able to generate interest, good interaction with students, flexibility in addressing subjects also not forecasted (as HIV denial from "scientists" on the web). Many resources are available in a FB group, such as the possibility to report sites, news, share videos, interactive games on the topic, or to create short surveys. The possibility to open a private chat with personalized counseling was used by a few students but was useful to discuss individual issues. Finally analysis showed relevant differences between groups and a progression of knowledge linked to participation level. Facebook intervention seems an effective and feasible tool in HIV STD prevention in students.

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