



“The use of educational strategies for promotion of knowledge, attitudes and contraceptive practices among teenagers – A randomized clinical trial”^{☆,☆☆}

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ARTICLE INFO

Keywords:

Health knowledge, attitudes, practice

Contraception

Adolescent

Health education

Education

ABSTRACT

Objective: To evaluate two educational interventions and identify differences between them in what concerns the promotion of knowledge, attitudes and practices in relation to the pill and male condom.

Methods: A randomized controlled clinical trial was conducted with teenagers, in which two different educational interventions were used, one based on the methodology of problematization (PG) and another on the pedagogy of transmission (TG). Knowledge, attitudes and practices were verified through a questionnaire applied before, one month and three months after the intervention.

Results: The two educational interventions promoted positive changes in the answers to questions on the knowledge, attitudes and practices of adolescents, from both groups. In what concerns knowledge, performance when answering the questionnaire was better after the intervention for both. However, only the PG showed improvements in performance over time. The TG showed a higher chance of displaying certain positive attitudes and more chances of correct answers about some practices.

Conclusion: The two educational interventions, despite having used different methodologies, have generally been proved to be effective for teaching about the pill and condom use, with positive impacts on knowledge, attitudes and practices, but with the methodology of problematization, the maintenance of knowledge in the time period studied was obtained.

1. Introduction

In Brazil, in 2012, of the 2,905,789 live births, 19.28% were from adolescent mothers (Azevedo et al., 2015). Considering that usually sexual activity in adolescence begins earlier, with immediate undesirable consequences, such as increased frequency of Sexual Transmitted Infections (STIs) and undesirable pregnancy that can therefore end in abortion, adolescents have the right of access to information and education on sexual and reproductive health (Brasil. Secretaria de Vigilância em saúde, 2010).

Sex education contributes to the promotion of health, to the prevention of STIs, to avoid unwanted pregnancies, and also provides opportunities to explore one's own values and attitudes, and develop skills related to decision-making, to communication and to the

reduction of risk behavior. It also promotes gender equity and the empowerment of adolescents (Rohrbach et al., 2015).

The school is where teenagers spend most of their lives, and where the environment is suitable for them to learn about sexuality, relationships, STIs and, when that learning happens, they should be able to develop values, skills and knowledge that help them make informed and responsible choices – either in their social or sexual lives (UNESCO, 2009). Peer education emerges as a special way of engaging adolescents (Ribeiro et al., 2013).

The field of education has been reassessing its teaching methods, in order to evaluate and re-evaluate the ‘banking’ system of transmission of knowledge, to develop and improve models so they become more flexible and contextual, building knowledge from the experiences of learners and educators together (Schaurich et al., 2007).

[☆] Concept of the article, analysis and interpretation of the data; writing the article; critical revision of the content and final approval of the version to be published.

^{☆☆} Critical review of content and final approval of the version to be published.

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One of these models is the Problematization Methodology, initially proposed by [Bordenave and Pereira \(1989\)](#) and which proved to be an innovative strategy in education, as both a studying and teaching method, having as a basis the propositions of Paulo Freire and, as premise of education, the reality surrounding the individual, their experiences, knowledge and expertise, aiming at the cognitive, critical, reflective and autonomous development of students and educator ([Berbel, 1999](#)).

On the other hand, the information transmission stance, or transmission pedagogy, is an educational process that is very common in the contemporary world, in which students assume a role of passive individuals compelled to retrieve such information only when requested ([Cyrino and Toralles-Pereira, 2004](#); [Bueno et al., 2004](#)).

The studies on knowledge, attitude and practice, known as the KAP survey model, have been a frequent research strategy for evaluating the use of contraception. It is known that studying only knowledge is not enough, because it is not able to engender appropriate practices on its own ([Alves and Lopes, 2010](#); [Bogani et al., 2015](#)). Hence the need to study the three aspects of the KAP model.

Researches, also with adolescents, have adopted this study method using questionnaires ([Martins et al., 2006](#); [Gamarra et al., 2005](#)). This type of study has been used for different subjects ([Mulango et al., 2018](#); [Wang et al., 2015](#)), including about contraception in adolescents ([Alves and Lopes, 2010](#); [Alves, 2012](#); [Alves and Lopes, 2008](#)).

Some psychological models involved in the change of behavior related to promoting healthy behavior, such as the Health Belief Model, can help health professionals to understand individual contraceptive needs, perceiving benefits and barriers that may interfere with some practice. Characteristics such as fear of an invasive procedure, cost and difficulty remembering to take a daily medication, history of drug use or some important medical diagnosis may help to choose or discard some options to determine the most appropriate contraceptive method or the need to change behavior ([Hall, 2012](#)).

All this considered, the following question may be asked: Could the methodology of problematization be used in an educational strategy aimed at modifying the KAP of adolescents in relation to birth control? Would this methodology produce different effects than the pedagogy of transmission?

The hypotheses of the study were that the methodology of problematization would be more efficient or that both methodologies would be efficient to promote changes in the KAP of the contraceptive methods studied.

There are several studies that used educational interventions, but their effectiveness was questioned at times, since a randomized clinical trial had not been conducted. Quality clinical trials are suggested, with well-designed interventions that make it possible to really identify the best interventions possible for the adhesion to contraception methods and appropriate attitudes and practices ([Lopez et al., 2014](#); [Halpern et al., 2014](#)).

Therefore, the objective of this study was to evaluate and compare these two educational interventions, one based on the methodology of problematizing and the other based on the pedagogy of transmission, in order to identify the effect they produce on the KAP of adolescents, in relation to the pill and the condom. These contraceptive methods were chosen because they are the ones most used by teenagers, including Brazilian ones, theirs being the most vulnerable age range with regard to contraceptive practices ([Crosby and Salazar, 2015](#); [Berenson and Rahman, 2012](#)).

2. Methodology

This was a longitudinal, randomized clinical trial type of intervention study, in which two educational strategies were compared, developed in three stages, during five months of follow-up; it was conducted with high school students of a city in the state of São Paulo, in which two different educational strategies were used for promotion of

the KAP of the use of the pill and condoms among teenagers: one based on the methodology of problematization ([Bordenave and Pereira, 1989](#)), named Problematization Group (PG) and another based on the pedagogy of transmission ([Cyrino and Toralles-Pereira, 2004](#)), named Transmission Group (TG).

The ethical aspects have been complied with in the various stages of the research, as determined by Resolution 466/2012 of the National Health Council, safeguarding the anonymity, confidentiality and privacy of the teenagers. This study CONSORT – Consolidated Standards of Reporting Trials was approved by the Research Ethics Committee of the University of Campinas, under No. 952.626, CAAE: 30178414.9.0000.5404. Participants and their parents granted their assent and consent through the signing of the Child Assent Form and of the Informed Consent Form, respectively. The research was registered in the Brazilian Registry of Clinical Trials and approved under identifier RBR-9f7f9p. For the elaboration of the article, the recommendations of the CONSORT ([Martins et al., 2009](#)) were followed.

For the calculation of the sample size, 5% significance level, 80% power, a difference of 20% between the groups and a proportion of 50% for the group that used the pedagogy of transmission were assumed. The sample calculation resulted in a sample of at least 94 individuals per group ([Chow et al., 2003](#)).

In the sampling scheme, it was opted for the random selection, with the R-Project software, of six classrooms: two of each year. One classroom of each school year was randomly assigned to the group that participated in educational activities based on the methodology of problematization (PG) and another to the group that used the pedagogy of transmission (TG).

Within each classroom, all students under 19 years of age were included, excluding those who did not have authorization from the parents or guardians to participate in the study, through the signing of the Informed Consent Form. It was decided to select all individuals of each classroom, rather than performing a simple random sample between all individuals of every classroom due to the difficulty that would be faced in applying intervention measures in students who belonged to different classrooms.

The educational intervention grounded on the methodology of problematization was based on the Charles Maguerez Arc ([Berbel, 1999](#)) for the development of activities and the following steps were followed: observation of reality, identification of problems/key points, theorizing, solution and implementation hypotheses.

Students who took part in this methodology had, initially, two meetings that promoted the reflection over attitudes and practices related to sexuality, the discussion on contraceptive methods and guidance concerning its proper use, with emphasis on the pill and condom. At the third meeting, the following dynamic, that represents the transmission of STIs and their prevention through the use of a condom, was held: 1st) A card with a symbol (triangle, circle, and star) was given to each participant; 2nd) While a song played, everyone would walk around the room and when the music stopped, each of them would approach a peer and copy all the symbols from their card; 3rd) This same action was repeated four or five times. In the end, the caption of each symbol was shown to the group: the green triangle (a single card) represented a person who is HIV positive; the red circle (50% of the cards) people who used a condom; the blue star (50% of the cards) symbolized people who did not use a condom. Then, the feelings triggered by the activity were discussed, as well as the issue of STIs transmission and prevention (condom use).

The students who participated in the educational activity based on the pedagogy of transmission watched an initial lecture on all contraceptive methods, presented by a group of students trained by a teacher who is an expert in the field. Before to start the research, this group of students received individual coaching and group training. This training took place before the beginning of the research. The participants of the TG, on two other meetings, firstly received a folder about the contraceptive pill and then another a folder about the male condom.

Therefore, the members of both groups participated in three meetings in which the topic of contraception was presented and/or discussed.

In addition, in three moments: before (Step 1), a month (Step 2) and three months (Step 3) after the educational intervention, a questionnaire with 60 items, some related to socio-demographic characteristics and others that evaluated the knowledge (20 questions – Q41 to 60), attitude (seven questions – Q22 to 28) and practice (15 issues –

Q19–21 and 29–40) associated with the use of the contraceptive pill and the condom was applied to all participants. Fig. 1 shows the questions of the KAP questionnaire, validated in a previous study (Alves, 2007).

The flowchart (Fig. 2) schematically shows the stages of the study, the allocation and randomization of participants.

The comparisons between the groups with regard to quantitative

No.	Question (Q)
Attitude (total: 07 questions)	
Q22	Do you think the male condom decreases pleasure in sexual intercourse?
Q23	Do you think teens should use a condom in all sexual relations?
Q24	If your partner does not want to use a condom, do/would you have sex with them anyway?
Q25	Do you believe the birth control pill is always harmful to your health?
Q26	Whose is the responsibility of using contraceptive methods?
Q27	Do you take a condom with you when going out with a boy/girl?
Q28	Do you use a contraceptive method in all sexual relations?
Practice (total: 15 questions)	
Q19	Do you usually plan your sexual encounters?
Q20	In your opinion, what method should be used in stable relationships?
Q21	In your opinion, what method should be used in unstable relationships?
Q29	I take the pill every day at the same time.
Q30	I forget to take some pills during the month.
Q31	When I forget to take two pills, I take one pill as soon as I remember and use condoms for seven days.
Q32	When I forget to take a pill, I leave one behind and continue taking the rest of them as usual.
Q33	I take the pill every day whenever I remember to do it.
Q34	When I forget to take a pill, I take it as soon as I remember and take the next pill at the usual time.
Q35	I use/my partner uses a condom in all sexual relations.
Q36	I put the condom on only at the moment of penetration.
Q37	I check the expiry date before opening the condom.
Q38	I put the condom on only when the penis is erect.
Q39	I remove the air from the tip of the condom before putting it on.
Q40	I take the condom off while the penis is still erect.
Knowledge (total: 20 questions)	
Q41	The pill prevents pregnancy by stopping ovulation, that is, the release of eggs from the ovaries.
Q42	If the woman has nausea and/or diarrhea for more than 24 hours, she should use some sort of barrier method such as the condom until the next menstrual cycle.
Q43	No medication interferes with the effect of the pill.

Fig. 1. The Frame 1 presents the questions of the KAP questionnaire.

Q44	The pill is a drug that can be used by any woman.
Q45	If the woman vomits within 1 hour after taking the pill, she does not have to take another pill.
Q46	The pill must be taken every day, but there is no specific time to take it.
Q47	To start using the pill there is no need to see a doctor beforehand.
Q48	After finishing a 21-day pack of pills, it is recommended to wait 7 days before starting a new pack.
Q49	The pill is not as effective a method as one might think, in fact, it is moderately effective.
Q50	The side effects of the pill are more common in the first three months, then they usually get better.
Q51	The condom is a barrier-type contraceptive method, that is, it prevents the sperm from entering the woman's body.
Q52	The condom only needs to be used at the moment of penetration.
Q53	The condom is the most suitable method for the prevention of STDs, including AIDS.
Q54	You should never use a condom without checking the expiry date beforehand.
Q55	The condom does not need to be removed with the penis still erect.
Q56	The condom should be used in all types of sexual intercourse, either vaginal, anal or oral.
Q57	Before putting it on, it is essential that you remove the air from the tip of the condom.
Q58	For better protection, the use of two condoms is recommended.
Q59	The condom is always a highly effective contraceptive method.
Q60	Signs of allergy such as redness, itching, swelling, when using a condom, are normal and go away with time.

Fig. 1. (continued)

variables of characterization of the sample were conducted using the Mann-Whitney test. To study the associations between the groups and the qualitative variables of characterization of the sample the Chi-square test was applied. When it was not possible to carry out this test due to the requirement of its assumptions, the Fisher exact test was performed (Pagano and Gauvreau, 2004).

The scores were calculated through the sum of the correct answers to the questions. The comparisons between the groups with regard to quantitative variables of characterization and to the knowledge, attitude and practice scores, in each of the stages, were conducted using the Mann-Whitney test. For comparisons between the stages, for each of the groups, with respect to the scores of knowledge, attitude and practice, the Paired Wilcoxon test was applied (Pagano and Gauvreau, 2004). For the evaluation of the results of these comparisons the Bonferroni correction was applied at the significance level (Johnson and Wichern, 1992). Once seven comparisons had been held, the significance level assumed was of 0.71%.

The comparisons between groups over the follow-up time with regard to questions relating to aspects of knowledge, attitude and practice were performed through Generalized Estimating Equations (GEE) models (Ghisletta and Spini, 2004). In the results, the obtained estimates of odds ratio were presented, along with their respective confidence intervals and p-value.

3. Results

In Table 1, the sociodemographic characteristics of the study population are shown. Both groups (PG and TG) have similar features, highlighted by the p-value which had no statistical significance.

3.1. KAP Scores

It was observed that, as for the total knowledge score, that is, the performance when answering the questions related to it, in the comparison between the PG and the TG, there was no difference in any of the stages. However, the comparison of the total score over time, in each group, showed differences when comparing Stage 1, which corresponds to the assessment of knowledge before the educational intervention, with Stage 2, the assessment performed one month after the educational interventions, both in the PG and in the TG ($p < 0.0001$ for both). However, only the PG showed differences, namely, a better performance in Stage 3, which corresponds to the evaluation three months after the interventions, in comparison with Stage 2 ($p = 0.0052$).

As for attitude, the TG showed difference in the comparison between Stage 2 and Stage 3, that is, one month and three months after

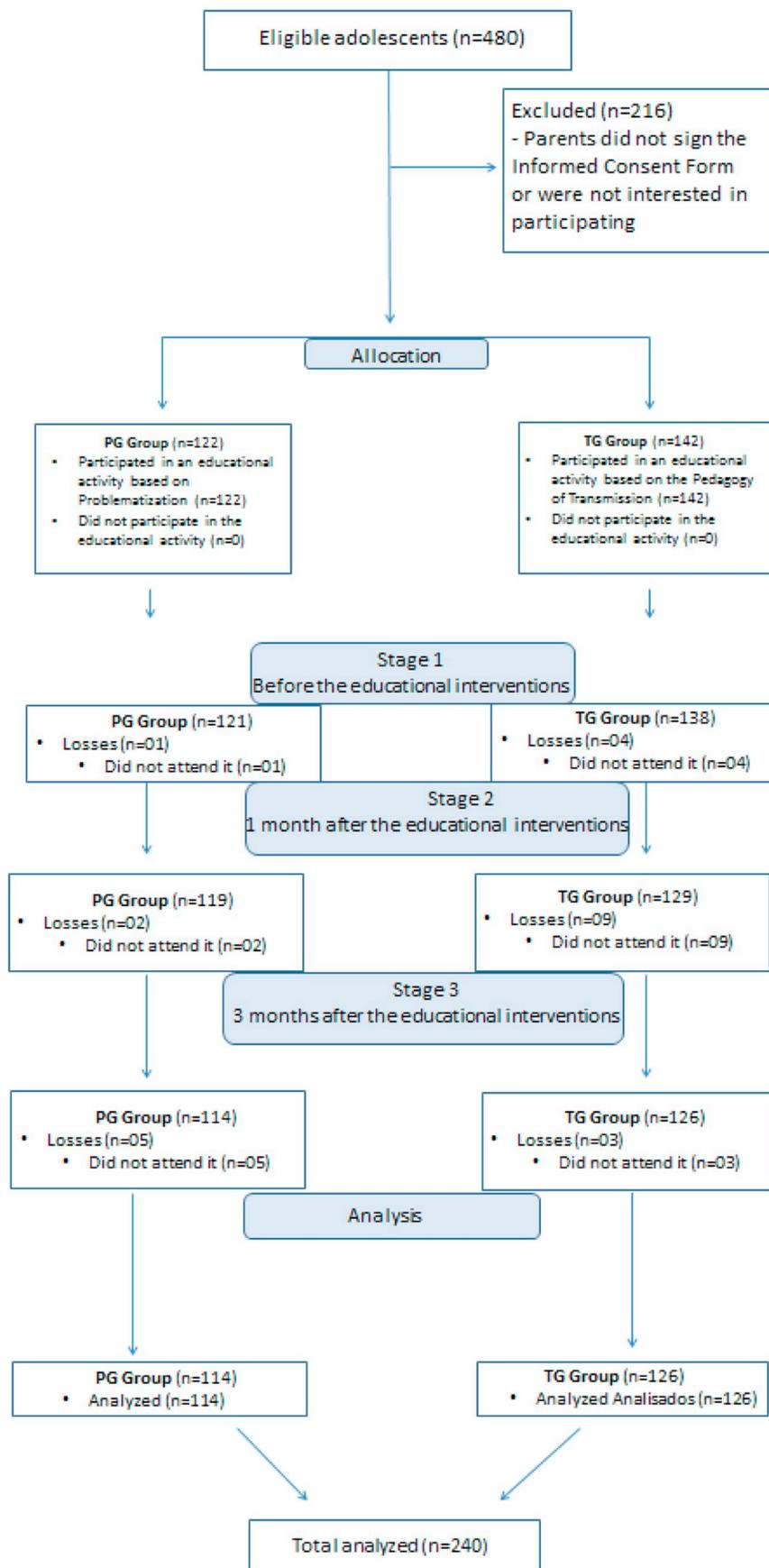


Fig. 2. The flowchart schematically shows the stages of the study, the allocation and randomization of participants.

Table 1
Sociodemographic characteristics of the adolescents who took part in the educational activities. Countryside of São Paulo, SP, Brazil, 2015.

Variable	Groups				p-Value*
	PG		TG		
	n	%	n	%	
Gender					0.3784
Female	68	56.20	70	50.72	
Male	53	43.80	68	49.28	
No answer	01		04		
Ethnicity					0.7848
White	89	73.55	106	76.81	
Yellow (Asian)	01	0.83	02	1.45	
Mixed	26	21.49	25	18.12	
Black	04	3.31	02	1.45	
Indigenous	01	0.83	02	1.45	
Other	00	0.00	01	0.72	
No answer	01		04		
Religion					0.4537
Catholic	62	51.24	78	56.52	
Spiritualist	07	5.79	09	6.52	
Evangelic	30	24.79	29	21.01	
Umbanda/candomblé	02	1.65	00	0.00	
I have no religion	18	14.88	16	11.59	
Other	02	1.65	06	4.35	
No answer	01		04		
Paid job					0.4265
No	108	90.76	128	93.43	
Yes	11	9.24	09	6.57	
No answer	03		05		
Household income ^a					0.9216
0	01	0.85	01	0.78	
1 to 5	57	48.72	67	51.94	
6 to 10	45	38.46	45	34.88	
> 10	14	11.97	16	12.40	
No answer	05		13		
Presence of spouse					0.4694
No	91	75.21	109	78.99	
Yes	30	24.79	29	21.01	
No answer	01		04		
Who they live with					0.6137
Alone	01	0.83	00	0.00	
With friends	02	1.65	04	2.90	
With family	118	97.52	133	96.38	
Other	00	0.00	00	0.72	
No answer	01		04		
Beginning of sexual activity					0.4611
No	92	76.67	111	80.43	
Yes	28	23.33	27	19.57	
No answer	02		04		
Total	122	100	142	100	

PG = Problematization Group.

TG = Transmission Group.

* Significance level = 5%.

^a Household income was valued in minimum wages. A minimum wage was R \$ 880.00 at June of 2018.

the educational interventions ($p < 0.0001$). There were no differences in the comparison between groups concerning this score. The same occurred for practice, in which there were no differences in the comparison between groups, as well as between stages.

Table 2 presents the assessment of the KAP results and describes the comparison of the PG and with the TG between stages, i.e., between the three moments of the KAP assessment, based on the questions that showed significant results.

In the comparison between the groups, in Stage 1, the PG had more chance of correctly answering the questions (Q) concerning the use of the pill, how to proceed in situations that may interfere with the effectiveness of the pill, and adverse reactions of the male condom than the TG.

In Stages 2 and 3, that is, one and three months after the educational

interventions, the PG had more chances of correctly answering the questions regarding the effectiveness of the pill and of condom use.

On the other hand, in Stage 2, the PG had less chance than the TG of correctly answering the questions related to drug interaction and the existence of contraindications for the use of the pill. In addition, in Stages 2 and 3, the PG had less chances of correctly answering the question concerning the effectiveness of condoms.

Considering the assessment of **knowledge** over time in each educational intervention group, in the PG, when comparing Stages 2 and 1, i.e., one month after the intervention and before it, it was found that it was more likely to correctly answer most questions (13 or 65%). In relation to the TG, it was also more likely to correctly answer most questions (15 or 75%). In the comparison of Stage 3 with Stage 2, that is, three months after the educational intervention and a month after, in the PG there were more chances of participants correctly answering a question which refers to the pill's drug interaction. In the TG there were more chances of participants correctly answering the questions related to the effectiveness of the pill and its side effects. However, there were lower chances of them correctly answering the question referring to the contraindications of the pill.

With regard to the questions related to **attitudes**, when comparing the PG with the TG, it was noted that in Stages 2 and 3, the PG had less chance of correctly answering the question which concerns the interference of condom use in sexual intercourse. The same occurred in Stage 2, with the question that related to the habit of bringing a condom to sexual encounters.

In the comparison of Stage 2 with Stage 1, the PG had greater chances of positively answering the question that concerning the opinion on the pill being harmful to health, which did not happen in the comparison between Stages 3 and 2, chances being lower in this case.

In the questions related to **practice**, in the comparison between groups, it was found that, in relation to the condom, in Stage 2, the PG had lower chances of correctly answering question about its correct use.

In the PG, in the comparison of Stage 2 with Stage 1, there were less chances of participants correctly answering the question about the habit of planning sexual encounters, and the question referring to the use of the pill. On the other hand, the PG had more chances than the TG of correctly answering question about the opinion of which method should be used in stable relationships.

In what concerns the TG, in the comparison between Stages 2 and 1, there were more chances of participants correctly answering questions relating to the use of the pill and to the use of condoms.

4. Discussion

It was found that, after the educational interventions, the PG maintained knowledge over the period of the study and the TG had more chances of demonstrating appropriate attitudes and practices, despite there being changes in the three areas, namely, in the knowledge, attitudes and practices of adolescents with regard to the contraceptive methods studied for both groups.

In what concerns knowledge, there was an increase in the number of correct answers in both groups, but the comparison between them did not show significant differences. However, when the groups were compared over time, a statistically significant difference was observed only for the PG in the comparison of the evaluations of the third with the first month after the intervention. This means that, after three months of the educational intervention, the PG maintained the increase of knowledge, which did not occur for the TG. This result is in line with the proposal of the problematization methodology, according to which when adolescents problematize their own realities, they become able to observe the problems surrounding them, reflect more critically and apply their knowledge in finding a solution (Berbel, 1999), which could contribute to consolidating this knowledge.

Problematization is part of the critical conception of education. In this way, it aims at mobilizing the social, political and ethical potential

Table 2

Comparison between groups and between the stages of data collection according each question (Q) (only significant results are showed). Countryside of São Paulo, SP, Brazil, 2015.

Question	Comparisons (between groups and between stages)	Odds ratio	Confidence Interval		p-Value*
			Inferior limit	Superior limit	
Attitude					
Q22	PG – TG (Stage 2)	0.5699	0.3287	0.9881	0.0452
	PG – TG (Stage 3)	0.5074	0.2923	0.8808	0.0159
	Stage 2 – 1 (PG)	1.4963	1.0508	2.1306	0.0254
	Stage 2 – 1 (TG)	1.8218	1.2124	2.7375	0.0039
	Stage 2 – 1 (PG)	2.6302	1.4411	4.8007	0.0016
Q25	Stage 3 – 2 (PG)	0.5696	0.3569	0.9090	0.0183
	Stage 2 – 1 (TG)	8.6899	3.6357	20.7703	< 0.0001
	PG – TG (Stage 2)	0.4052	0.1782	0.9214	0.0311
Practice					
Q19	Stage 2 – 1 (PG)	0.3684	0.1636	0.8294	0.0159
Q20	PG – TG (Stage 2)	10.0625	1.1258	89.9362	0.0388
Q29	Stage 2 – 1 (PG)	0.2444	0.0660	0.9056	0.0350
Q32	Stage 2 – 1 (TG)	4.2000	1.1162	15.8040	0.0338
Q34	Stage 2 – 1 (TG)	3.2667	1.1152	9.5688	0.0309
Q36	PG – TG (Stage 2)	0.1414	0.0266	0.7529	0.0219
Q37	Stage 2 – 1 (TG)	2.0455	1.0667	3.9224	0.0312
Q39	Stage 2 – 1 (TG)	9.6250	1.4218	65.1584	0.0203
Q40	Stage 2 – 1 (TG)	5.1282	1.1215	23.4503	0.0351
Knowledge					
Q41	Stage 2 – 1 (PG)	2.0813	1.2410	3.4905	0.0055
	Stage 2 – 1 (TG)	3.5694	1.9524	6.5257	< 0.0001
Q42	Stage 2 – 1 (PG)	4.5998	2.8786	7.3502	< 0.0001
	Stage 2 – 1 (TG)	12.3636	7.0782	21.5957	< 0.0001
Q43	PG – TG (Stage 2)	0.4367	0.2258	0.8445	0.0138
	Stage 2 – 1 (PG)	2.3484	1.4893	3.7031	0.0002
	Stage 3 – 2 (PG)	1.7857	1.1458	2.7830	0.0104
	Stage 2 – 1 (TG)	3.8146	2.3004	6.3255	< 0.0001
Q44	PG – TG (Stage 2)	0.5098	0.2813	0.9240	0.0264
	Stage 2 – 1 (PG)	2.1667	1.3640	3.4416	0.0011
	Stage 2 – 1 (TG)	4.3871	2.7040	7.1179	< 0.0001
	Stage 3 – 2 (TG)	0.6118	0.4202	0.8907	0.0103
Q45	PG – TG (Stage 1)	2.3985	1.4135	4.0698	0.0012
	Stage 2 – 1 (PG)	2.5851	1.5711	4.2536	0.0002
	Stage 2 – 1 (TG)	8.4912	5.1214	14.0785	< 0.0001
Q46	PG – TG (Stage 1)	1.8800	1.0130	3.4889	0.0454
	Stage 2 – 1 (TG)	3.4769	1.7497	6.9092	0.0004
Q48	Stage 2 – 1 (PG)	3.0357	1.8432	4.9997	< 0.0001
	Stage 2 – 1 (TG)	3.4440	2.2712	5.2223	< 0.0001
Q49	PG – TG (Stage 2)	5.4375	2.9755	9.9365	< 0.0001
	PG – TG (Stage 3)	3.8813	2.2411	6.7220	< 0.0001
	Stage 2 – 1 (TG)	0.2504	0.1505	0.4166	< 0.0001
	Stage 3 – 2 (TG)	1.7314	1.0877	2.7560	0.0206
Q50	Stage 2 – 1 (PG)	2.0000	1.3252	3.0183	0.0010
	Stage 2 – 1 (TG)	3.7920	2.4474	5.8754	< 0.0001
	Stage 3 – 2 (TG)	1.5245	1.0043	2.3142	0.0477
Q52	Stage 2 – 1 (PG)	1.9048	1.2551	2.8908	0.0025
	Stage 2 – 1 (TG)	1.7326	1.1930	2.5162	0.0039
Q55	Stage 2 – 1 (PG)	4.3961	2.7697	6.9776	< 0.0001
	Stage 2 – 1 (TG)	7.2616	4.2407	12.4343	< 0.0001
	PG – TG (Stage 1)	1.8125	1.0296	3.1907	0.0393
Q56	PG – TG (Stage 2)	4.1524	1.5034	11.4690	0.0060
	PG – TG (Stage 3)	2.8333	1.0760	7.4605	0.0350
	Stage 2 – 1 (PG)	6.7655	2.9440	15.5478	< 0.0001
	Stage 2 – 1 (TG)	2.9531	1.8430	4.7320	< 0.0001
	Stage 2 – 1 (PG)	5.3981	2.8022	10.3989	< 0.0001
Q57	Stage 2 – 1 (TG)	3.1684	1.6726	6.0016	0.0004
	Stage 2 – 1 (PG)	2.4956	1.2881	4.8351	0.0067
Q58	PG – TG (Stage 2)	0.3232	0.1893	0.5519	< 0.0001
	PG – TG (Stage 3)	0.4001	0.2373	0.6745	0.0006
Q59	Stage 2 – 1 (TG)	2.4205	1.5987	3.6647	< 0.0001
	PG – TG (Stage 1)	1.8619	1.1115	3.1189	0.0182
	PG – TG (Stage 3)	1.8091	1.0471	3.1254	0.0336
	Stage 2 – 1 (PG)	1.5345	1.0076	2.3371	0.0460
	Stage 2 – 1 (TG)	2.6465	1.8171	3.8546	< 0.0001
Q60	Stage 3 – 2 (TG)	0.6791	0.4643	0.9932	0.0460

PG = Problemization Group.

TG = Transmission Group.

* Significance level = 5%.

of students so they may act as citizens and social actors, participating in the historical construction of their time (Berbel, 1998).

The evaluation of the intervention's effect over time is important to verify whether the educational activity is able to promote changes. In fact, a randomized controlled trial that developed educational interventions alongside American teenagers found that positive outcomes related to sexual health, increase in knowledge and appropriate attitudes, remained for a year after the activities. The authors did not describe the methodology used (Rohrbach et al., 2015). In spite of a shorter follow-up time, the present study has shown differences between the methodologies used in this regard.

The TG also had good results in relation to knowledge, when comparing the moments before and after a month of intervention. Both groups showed significant changes during this period in several questions but the TG had a higher odds ratio than the PG, which means participants were more likely to answer them correctly. These questions concern the correct use of the methods and their side effects, and the explanatory folder may have aided the consolidation of this knowledge.

In what concerns practice, we saw that the TG had better results overall. The PG did not receive any written information. It is possible that the questions that concern very specific information, such as “what to do when you forget to take the pill”, require some material for consultation, as occurred with the TG, in which participants received guidance material that probably facilitated the consolidating of the content, since this sort of information is more difficult to be remembered over time.

The PG had better results only in Stage 2 when answering a question which deals with the adolescents' opinion on the method that should be used in stable relationships, a very important fact, since adolescents tend to change method when the relationship becomes stable. Condom use is abandoned and replaced by the use of the contraceptive pill (Alves and Lopes, 2010). The reflection that was promoted in the activities developed with the problematization methodology may have led to this result in this particular question.

American schools that promote educational activities are able to stimulate the use of the condom among boys and of hormonal contraceptive methods among girls, when compared with schools that do not promote educational interventions (Minguez et al., 2015).

However, as previously mentioned, the increase in knowledge may not result in appropriate practices (Alves and Lopes, 2010; Bogani et al., 2015). Italian schools were able to promote an increase in the knowledge of adolescents on contraception and STIS, but without reducing risk behavior (Bogani et al., 2015).

In relation to attitudes, in general, the TG was more likely to demonstrate positive attitudes regarding the use of the studied contraceptives. In the question which refers to the opinion on whether the pill is harmful to health, the PG was more likely to answer positively a month after the educational intervention, but three months after, it had lower chances of doing so, i.e., it was not able to keep a positive attitude over time. However, this may also have been due to the increased time for reflection on the subject, as the consideration that the pill has side effects and contraindications may have declined the chances of participants showing a positive attitude in relation to them.

A study performed with Brazilian adolescents, with the aim of getting to know their knowledge and attitudes regarding contraception, found some improper attitudes in relation to the use of contraceptives and to the occurrence of unwanted pregnancies. The study indicated the need for educational programs in the school environment itself, since this is where they start dating, where they receive information and spend most of their time (Mendes et al., 2011).

The present study also indicates the importance of sex education being performed continuously, at various times of the school life of adolescents, since we have realized that, in some situations, they forget the information provided, especially when it comes to contraception, as the various day to day circumstances influence the effectiveness of the method and the ability to continue using it (Kirby et al., 2010).

We know that for the use of the pill and condoms to be effective, their correct and consistent use is necessary. In relation to the birth control pill, many young women experience difficulty with regard to its use, and nearly half of them stop using it within six months after having started (Berenson and Rahman, 2012). Teenagers who use birth control pills typically have many questions and concerns about this method, and, if such questions are not answered, their use tends to be discontinued. An American study that monitored users of the pill for a year, through monthly contact over the phone in the first half and bi-monthly contact in the second half, showed that users received great help regarding the use of the pill and also other issues related to STIS and their prevention through the condom. However, there were no meaningful results for the group that was not monitored through phone calls (Kirby et al., 2010).

The combination of educational strategies has been shown to reduce unwanted pregnancies among adolescents, and studies are needed to find out which strategies are most appropriate and which impact people's lives over time (Chioma et al., 2014). This study, in addition to bringing interesting strategies to the adolescent group, evidenced the one that provides the greatest impact on KAP over time, improving safe sexual practice and avoiding the risky sexual behavior.

Schools and adolescents can also benefit from educational activities focused on sex education. Future studies can test the use of modern technology in educational interventions, such as cellphones, computers, internet, games and digital applications to improve the KAP on the use of contraceptives among teenagers. And, as the goal of any health education program is the maintenance of healthy behaviors, other researches may contemplate monitoring for a longer period of a year or more.

5. Conclusions

The pedagogy of transmission, through lecture given by peers and explanatory folders, and the problematization methodology, through group dynamics and the studying of the theme in question from the experiences of the adolescents, promoted changes in the KAP, in relation to the pill and the male condom, of this group of teenagers. What distinguished the pedagogy of transmission from the simple transmission of information, as described in the literature, was the use of a language that was more appropriate and interesting for this age range, use by the peers and in the explanatory folders.

With the problematization methodology, it was possible to obtain the maintenance of the knowledge on contraceptive methods, over the time period evaluated. The pedagogy of transmission showed better effects on aspects related to attitude and practices.

However, the two methodologies have proved effective for teaching. Therefore, these methodologies can be used, in accordance with the profile and needs of the students and/or educator, depending on the context, the work practice of the teacher or health professional, and of the time and resources available. It is likely that the combination of these strategies can be even more effective.

6. Limitations

The limitations of this study include the participation of a small number of teenagers who already had a sexual life, which may have jeopardized the results in what concerns practice. In this way, it is suggested that similar studies with sexually active teenagers are conducted. In addition, the KAP questionnaire was not constructed as a psychometric scale, even so, it has been used in some studies (Alves and Lopes, 2010; Alves, 2012) and was requested by other researchers that desire to develop similar studies.

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