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Educational Action in Adolescents of a Public School about the Prevention of Skin Cancer

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Abstract

Introduction: Skin cancer is the most prevalent malignancy worldwide. It is necessary to intervene from childhood in its prevention. The lack of awareness of the population demands photoeducation activities, so that photoprotection habits are built. **Goals:** Compare previous and immediately acquired knowledge and attitudes of primary school students, participants in this educational action aimed at the prevention of skin cancer. Analyze student satisfaction with the educational program attended. **Method:** A semi-experimental, quantitative study was carried out, based on educational intervention. The teachers, mediators of the intervention, were guided by the researcher, with two dialogical workshops. The educational program was applied over ten weekly activities, based on an active method, to 32 students from the eighth year of a public school in a municipality in the countryside of São Paulo, who answered questionnaires before the beginning and after the end of the activities. Sociodemographic data and phenotypic characteristics of risk for skin cancer, as well as information about knowledge and practice of photoprotective attitudes were previously collected. At the end of the educational intervention, students answered a close-ended questionnaire on knowledge and attitudes and a questionnaire on their satisfaction with the program. Quantitative and comparative analysis was carried out between the questionnaires on pre-intervention and post-intervention knowledge and attitudes. **Results:** The educational program was evaluated satisfactorily by the students, contributed to the learning of important concepts for photoprotection and changing attitudes. **Conclusion:** The educational program on the prevention of skin cancer, aimed at children and adolescents, using active teaching-learning methods, enabled the gain of knowledge and signs of photoprotective attitudes.

Keywords

Educational and Dissemination Materials, Health Education, School Health Services, Prevention of Diseases, Skin Neoplasms, Continuing Education

1. Introduction

Skin cancer is a worldwide public health issue and investing in its prevention, starting in our early years, is the best tool to change this scenario.

Malignant neoplasms of the skin can originate from different cell types, the most common being basal cell carcinoma and squamous cell carcinoma, constituents of the group called non-melanoma skin cancer, which among skin tumors is the one with the highest incidence, corresponding to more than 95% of skin cancer cases, and the estimate for Brazil for each year of the 2020-2022 triennium is about 177,000 new cases (Sampaio & Rivitti, 2018; Chinem & Miot, 2011; Lomas et al., 2012; Instituto Nacional do Câncer, 2020). Predominantly affecting individuals with low skin phototype and with aggressiveness attributed to their power of local invasion, it confers physical mutilation and significant psychosocial damage on the patient, as well as high financial costs to families and health institutions (Lomas et al., 2012; Chen et al., 2013; Fitzpatrick, 1988).

Melanoma skin neoplasms, in turn, originate from melanocytes and dermal nevus cells and have a high fatality rate due to the high likelihood of metastasis (Sampaio & Rivitti, 2018; Weyers, 2012; Almeida, 2020).

Higher skin phototypes are not without risk. One of the subtypes of melanoma, called acral lentiginous melanoma, is almost exclusively prevalent in black-skinned individuals, and ends up being late noticed and diagnosed (Ribeiro et al., 2016).

Both types of neoplasia correlate with exposure to Ultraviolet (UV) radiation. It is assumed that acute and intermittent exposure to sunlight would be sufficient to cause melanoma, whereas, in basal and squamous cell carcinoma, chronic exposure to sunlight would be the mutagenic factor (Sampaio & Rivitti, 2018; Chen et al., 2013; Ribeiro et al., 2016). The association between tanning and melanoma in young patients is also described (Nilsen et al., 2016). Childhood sun exposure appears as the most harmful factor in the genesis of skin cancer (Bataille, 2013).

According to the World Health Organization (WHO), non-melanoma skin cancer is one of the most prevalent worldwide, and late diagnosis and inaccessible treatment are quite common (Folha Informativa Câncer, 2018).

In 2018, Brazil ranked seventh among the countries in the world with the highest incidence of non-melanoma skin cancer, and ninth in relation to the melanoma type (GLOBOCAN, 2018).

The geographic position of Brazil poses a higher risk to its population, in addition to the local culture of tanning that encourages many people to practice intentional and involuntary sun exposure, during daily and work activities

(Schalka et al., 2014; Martinez et al., 2006; Szklo et al., 2007).

A study on the exposure of Brazilian workers to UV rays demonstrated a daily dose of UV rays 50 times higher than the safe dose of 108 J/m^{2,} recommended by the WHO 14. Therefore, the adoption of photoprotective attitudes is required (Ministerio da Saude, 2010; Instituto Nacional do Câncer, 2009).

Photoprotection measures include educational processes, topical photoprotection, oral photoprotection and mechanical photoprotection (Schalka et al., 2014).

The Brazilian Photoprotection Consensus recommends more effective photoeducation strategies (Schalka et al., 2014).

Most studies on photoeducation are not Brazilian, consist of short-term interventions, use self-reports to assess habits and have short-term follow-up (Lower et al., 1998; Buller et al., 2011; Lin et al., 2011).

It is known that the effectiveness of these measures is dependent on their pedagogical capacity in health education and their potential for raising awareness, as it should, above all, lead people to changes in habits and attitudes (Alonso et al., 2020; Rodríguez-Zamorano et al., 2018; Rocha et al., 2018).

Children and adolescents should be encouraged to adopt photoprotection habits, since photoexposure in this early stage of life is an important risk of carcinogenesis. In addition to being more receptive to prevention information, supported by models represented by teachers, children and adolescents tend to develop consolidated habits in adulthood, and may also influence other family members (Rocha et al., 2018; Reynolds et al., 1996; Bastuji-Garin et al., 1999; Kouzes et al., 2017; Jha et al., 2017; Stölzel et al., 2014).

The traditional approach has a prescriptive educational attitude, while the active approach seeks to problematize and include the listener as a protagonist in the process of deconstruction and construction of knowledge, promoting greater engagement and transformation of habits; this includes, in the process of "health literacy", the movement of reflection and "*teachback*", Diverse teaching materials and language appropriate and facilitated to the target audience (Simmons et al.,, 2017; Souza et al., 2018; Thomson, 2006).

Thus, the valorization of educational health measures is fundamental for changing the profile: incidence, morbidity and mortality of skin neoplasms.

In face of the social representation of the teacher as a very present model in society and the potential of this role (Guimarães, 2003), this study proposes to prepare public school teachers, in an active method and health knowledge, for the application of an educational program aimed at health promotion and skin cancer prevention to primary school students.

It is hoped that the gains associated with active methods, based on meaningful learning and constructivist theories, as well as the involvement of teachers in the design and implementation of activities, can reinforce positive knowledge and attitudes related to precautions against neoplastic skin lesions (Guimarães, 2003; Eppinger et al., 2013; Guy et al., 2016; Lima, 2017).

Thus, this study, held in a typical Brazilian city, with hot temperatures and great sun exposure of the population due to the economic activity and lifestyle

habits, seeks to compare previous and immediately acquired knowledge and attitudes of primary school students in relation to their participation in educational action aimed at the prevention of skin cancer and to analyze the students' satisfaction with the educational program attended.

2. Methods

A descriptive and quasi-experimental, quantitative study was carried out in a public school in the countryside of São Paulo, with educational interventions in health for students in the eighth grade of primary school, through previously qualified teachers.

The study was approved by the Research Ethics Committee and its members signed the Free and Informed Consent Form (ICF) and/or Free and Informed Consent Form (TALE), in accordance with Resolution 466/2012 of the National Health Council (Conselho Nacional de Saúde, 2012).

The two moments of the research were: dialogical workshops with teachers and an educational program with students; both were carried out in a public primary school in a small city in the countryside of the State of São Paulo.

The program was proposed to 3 public schools in the Municipality, and to all of its teachers, but we only had one school and one teacher interested. The age range of students and the school year to be applied was decided by the authors and the school coordinator, according to the students' intellectual background.

The participants were a primary school teacher and 32 eighth grade students, literate and able to read, write and understand, in the Portuguese language participated in the whole study. Those who did not answer the questionnaires and/or who did not participate in all the activities proposed by the teacher were excluded. The teachers were the mediators of the educational program and the students, its participants.

The researcher made teaching materials available that were used by the teacher, who contributed with ideas and suggestions to the program, so that it was active, interdisciplinary and integrated. There were two workshops lasting three hours each, fortnightly, aimed at preparing the teacher to apply the photoprotective educational program and to facilitate students' learning about skin cancer.

The educational program applied was formed by 10 weekly meetings, of 90 minutes each, totaling 15 hours of activities, over 75 days, using active teaching/learning methodologies (Thomson, 2006; Guimarães, 2003; Eppinger et al., 2013; Guy et al., 2016; Lima, 2017; Sousa et al., 2012; Glanz et al., 2002).

Prior to the educational program, the sociodemographic questionnaires Q1 and Q2, the latter called Q2-pre, were applied on the theoretical content and habits of photoprotection and skin cancer prevention. A similar questionnaire, called Q2-post, was applied after the educational program, in addition to the Q3 questionnaire.

The following theoretical support materials were used:

- Primer on skin cancer prevention released by the Ministry of Health (Centro de Previsão do Tempo e Estudos Climáticos, 2019).

- Printed and multimedia materials published by the Brazilian Society of Dermatology and the Sol Amigo da Infância Project (Sociedade Brasileira de Dermatologia, 2017b).
- Printed and multimedia materials published by the Australian and New Zealander program "SunSmartSchool", adapted, and translated by the researcher, in Portuguese (Nova Zelândia, 2019).
- Materials published on the Internet by the *website* of the National Institute for Space Research and the Center for Weather Forecasting and Climate Studies (Centro de Previsão do Tempo e Estudos Climáticos, 2019).
- Educational videos available on *Youtube*™ (Youtube, 2019).

The activities of the educational program are summarized in the **Table 1** below.

The questionnaires used were: R1, R2, Q1, Q2-pre, Q2-post and Q3. The R1 and R2 instruments were descriptive, to characterize the school and the teacher. Q1 and Q2 were questionnaires translated and adapted from the SunSmartSchool program, and from the Brazilian Society of Dermatology (Sociedade Brasileira de Dermatologia, 2017a; Nova Zelândia, 2019; Instituto Melanoma Brasil, 2013).

Table 1. The synthesized activities of the educational program.

Activity	Trigger	Development	Outcome	Intercurrence
First: I felt it on the skin	Interview with a melanoma patient	Dialogical exposition of prior knowledge about skin cancer	Exposure of personal and family stories	-
Monday: I can't see it, but I can feel it.	Experiment with tonic water and a RUV pen	Group discussion on the composition of the sun's rays;	Rescue of prior knowledge	Lots of motivation
Third: Keeping an eye on the sun	Access to the Brazilian Institute of Meteorology	Characterize geographic aspects of the city and region	Galileo Galilei's experiences were recalled	-
Fourth: Peoples History and Photoprotection	Experiment with cans filled with water, covered with black fabric	Typical and historical clothing and habits for protection against sunlight	They discussed ways to protect themselves	
Fifth: Tanning is not healthy at all	Introduction to sunscreen	Discussion of photoprotection measures, identifying the sunscreen factor (SPF)	They were introduced to sunscreen and the correct way to use it	They were very receptive to the use of sunscreen
Friday: Everyone is at risk	Classification of the skin phototype with public persons as an example	Understand classification and self-assess	Recognize that all skin types are at risk	-
Seventh: Keeping an eye on the skin	Skin self-exam	Learning about the self-exam	Apply to colleagues and look for ABCDE and Ugly Duckling moles (Ilyas et al., 2017)	-
Eighth: Deadly Machine	Brazilian Legislation on Artificial Tanning	Group discussion on personal stories and tanning	-	Students' indignation
Ninth: Do not chicken out when taking care of your skin	How to make the school environment more protected?	Ideas for implementing new habits and improvements at school	-	-
Tenth: Skin protectors	How to encourage family and friends?	Work suggestions to encourage healthy practice in the community	-	-

Q1: Close-ended questionnaire for sociodemographic analysis, such as gender, age, ethnicity, education, and income of the family provider; and risk factors for skin cancer, including personal and family history of skin cancer, skin color, eyes and hair, number of moles and spots on the body, sunburn event and photoexposure habits (Sociedade Brasileira de Dermatologia, 2017a).

Q2: Close-ended questionnaire to assess knowledge and attitudes of photoprotection and prevention of skin cancer.

Q3: Likert scale tool of satisfaction, regarding the educational program received (Likert, 1932).

Q4: Judges were invited to validate data collection tools according to the criteria: being a doctor with specialization in dermatology or plastic surgery, with a doctorate degree and being active in care or teaching. All instruments were applied to a pilot group with 15 eighth grade Primary School students in another school.

The reports were analyzed descriptively as well as the results of the questionnaires. The quantitative analysis was based on Wilcoxon and chi-square calculations with a 95% reliability index (SAS Institute, 2018).

3. Results

Descriptive aspects

Characterization of the HEI (R1) and the teacher (R1, R2 and Q1)

The participating school is a public primary and secondary school, with 731 students, with an average of 40 students per class and 39 teachers. Each class has 9 different teachers.

The curriculum is subject-oriented. There is no sun protection policy in place or guidance, or incentives given by teachers to parents or students.

The measure adopted by the students during the breaks for photoprotection is the search for the shade and the use of a cap, which is allowed in the breaks. UV radiation and its harms are subjects studied in the Science subject, only in the ninth year.

The teacher has a degree in Biology, has taught Science for 8 years, and reports participation in training in active teaching/learning methodologies, using instruments based on these methodologies in educational activities.

Sociodemographic and phenotypic characterization of the studied population

The population of participating students is 53% male and 47% female: the age ranges from 11 to 15 years, with an average of 14 years. 49.5% consider themselves white and 44%, brown, being a minority of blacks. The predominant family income is 1 to 3 minimum wages, and most parents have completed secondary school.

Regarding the risk factors for skin cancer: 35.48% consider their skin to be of a low phototype (phototypes 1 and 2); as for the eyes, light hair, and the presence of freckles, 10.75%, 20.43% and 11.82% have these characteristics, respectively.

As for the presence of more than 50 spots and spots larger than 1 cm, 7.52% and 13.27% responded positively; however, an important portion of students who did not answer or did not know how to answer is noteworthy, showing low concern with the issue.

As for risky behavior, more than 60% report daily sun exposure and more than 70% report at least one sunburn episode.

As for the family history of skin cancer, only 11.82% report a positive history, and more than 30% did not know how to answer.

As for the family history of cancer, a larger proportion of 20% also did not know or did not respond, which again shows low awareness of the topic.

Quantitative Results

In total, 32 students answered the questionnaire Q2-pre, Q2-post and Q3, completing 100% the proposal of the educational program.

Presentation of comparative results, under quantitative analysis, of the questionnaires of knowledge and attitudes Q2 pre-intervention and post-intervention, showing the mean and median (Tables 2-4).

Analysis of the Educational Program Satisfaction Questionnaire (Table 5).

4. Discussion

Regarding the quantitative data of photoprotective attitudes, there was no statistically significant change due to a bias: the educational program was developed in the months of the spring and students did not go through the summer after the program, so that it was possible to compare this behavior.

Regarding the qualitative responses to the attitude's questionnaire, there was statistical significance for question number four, which demonstrates that the educational program sensitized 33.4% of students to the use of sunscreen, even if rarely.

Table 2. Statistical analysis of Q2 attitudes questionnaire, quantitative answers.

Questions	Questionnaire				Probability
	Before		After		
	Average	Median	Average	Median	
1) During the summer, how much time, on average, do you spend sunbathing, per day, from Monday to Friday?	1.55[1]	1.00	1.68	1.00	0.677
2) During the summer, how much time, on average, do you spend sunbathing each day during weekends (Saturday and Sunday)?	1.59	1.00	1.23	1.00	0.401
3) In the last 12 months, how many times did you blush or burn from the sun for a day or more?	1.56[2]	1.00	1.43	1.00	0.612

[1]The numbers represent the quantity in hours; [2]Number of excessive exposures to the sun.

Table 3. Statistical analysis of Q2 attitudes questionnaire, qualitative answers.

Answer	Before			After			Probability
	Fi	Fp	Total	Fi	Fp	Total	
4) How often, during a week, do you use sunscreen?							
Never	21	67.7	32	10	32.3	31	0.008
Rarely	7	33.3	32	14	66.7	31	0.050
Sometimes	2	33.3	32	4	66.7	31	0.368
Often	2	50.0	32	2	50.0	31	0.974
Always	0	0	32	1	100.0	31	0.306
5) How often do you use a sleeve shirt to cover your shoulders and arms?							
Never	9	56.3	32	7	43.8	29	0.724
Rarely	5	45.5	32	6	54.6	29	0.607
Sometimes	3	50.0	32	3	50.0	29	0.899
Often	11	55.0	32	9	45.0	29	0.781
Always	4	50.0	32	4	50.0	29	0.881
6) How often do you wear a hat or cap?							
Never	25	49.0	32	26	51.0	31	0.562
Rarely	6	54.6	32	5	45.5	31	0.784
Sometimes	1	100.0	32	0	0.0	31	0.321
Often	0	0.0	32	0	0.0	31	-
Always	0	0.0	32	0	0.0	31	-
7) How often do you use parasols/umbrellas or seek shelter in the shade?							
Never	20	50.0	33	20	50.0	31	0.747
Rarely	7	58.3	33	5	41.7	31	0.602
Sometimes	0	0.0	33	1	100.0	31	0.298
Often	5	71.4	33	2	28.6	31	0.265
Always	1	25,0	33	3	75.0	31	0.272
8) How often do you wear sunglasses?							
Never	26	50.0	32	26	50.0	31	0.784
Rarely	5	50.0	32	5	50,0	31	0.956
Sometimes	1	100.0	32	0	0.0	31	0.321
Often	0	0.0	32	0	0.0	31	-
Always	0	0.0	32	0	0.0	31	
9) How often do you expose yourself to the sun to get a tan?							
Never	26	56.5	31	20	43.5	31	0.082
Rarely	4	26.7	31	11	73.3	31	0.038
Sometimes	1	100.0	31	0	0.0	31	-
Often	0	0.0	31	0	0.0	31	-
Always	0	0.0	31	0	0.0	31	-

Continued

10) What is the natural color of your skin and what is its capacity to tan?							
Extr. Pale	3	50.0	32	3	50.0	31	0.967
Pale	14	48.3	32	15	51.7	31	0.712
Average	3	37.5	32	5	62.5	31	0.421
Light brown	11	61.1	32	7	38.9	31	0.300
Dark brown	1	50.0	32	1	50.0	31	0.982

Note: in question 10, the answers were summarized.

Table 4. Statistical analysis of Q2 knowledge questionnaire.

Answer	Before			After			Probability
	Fi	Fp	Total	Fi	Fp	Total	
1) Is it healthy to sunbathe?							
They do not know	12	44.4	31	15	55.6	28	0.252
Yes or No	10	66.7	19	5	33.3	13	0.430
2) Even on cloudy days, is it possible to get sunburnt?							
They do not know	7	50.0	31	7	50.0	31	1.000
Yes or No	19	48.7	24	20	51.3	24	0.712
3) Can glass protect us from the sun's rays?							
They do not know	9	50.0	31	9	50.0	31	1.000
Yes or No	4	100.0	22	0	0.0	22	0.036
4) Even on days when the temperature is not so high, am I at risk of burning myself?							
They do not know	9	56.3	31	7	43.7	31	0.562
Yes or No	20	47.6	22	22	52.4	24	0.927
5) In winter, is it possible to get sunburnt?							
They do not know	13	50.0	31	13	50.0	30	0.912
Yes or No	11	47.8	18	12	52.2	17	0.556
6) What can we do to protect ourselves from the sun?							
Wear sunscreen	9	40.9	31	13	59.1	31	0.288
Avoid sun exposure	4	66.7	31	2	33.3	31	0.390
Wear long clothes	0	0.0	31	1	100.0	31	0.313
All options	18	54.6	31	15	45.4	31	0.445
7) What is the riskiest time for sun exposure?							
Between 10 am and 4 pm	25	58.1	31	18	41.9	30	0.077
Until 12 a.m. and after 6 p.m.	5	35.7	31	9	64.3	30	0.198
Between 8 a.m. and 6 p.m.	0	0.0	31	2	100.0	30	0.144
Before 9 a.m. and after 4 p.m.	1	50.0	31	1	50.0	30	0.981
8) What is the benefit of protecting yourself from the sun?							
Not feeling thirsty	0	0.0	31	0	0.0	31	-
Avoid tanning too much	9	47.4	31	10	52.6	31	0.783

Continued

9) And what is the main problem if we don't protect ourselves from the sun?							
Skin cancer	14	45.2	31	17	54.8	32	0.527
Burns	3	75.0	31	1	25.0	32	0.286
Aging	1	100.0	31	0	0.0	32	0.306
All options	13	48.2	31	14	51.8	32	0.884
10) What is the best sunscreen and the best way to use it?							
SPF30, every 2 hours	23	54,8	31	19	45.2	29	0.464
Any SPF, once a day	4	57.1	31	3	42.9	29	0.758
SPF15, twice a day	2	33.3	31	4	66.7	29	0.344
SPF50, once a day	2	40.0	31	3	60.0	29	0.586
11) What is the correct amount of sunscreen to use?							
16 tablespoons (tbsp)	14	73.7	31	5	26.3	29	0.020
10 tablespoons (tbsp)	0	0.0	31	2	100.0	29	0.137
1 teaspoon face, 3 tbsp body	15	41.7	31	21	58.3	29	0.058
1 tablespoon face	2	66.7	31	1	33.3	29	0.594
12) Is artificial tanning a safe way to tan and also protect your skin?							
They do not know	12	40.0	31	18	60.0	31	0.127
Yes or No	5	55.6	19	4	44.4	13	0.783
13) Should even people with dark brown and black skin protect themselves from the sun's rays (ultraviolet radiation)?							
They do not know	3	50.0	31	3	50.0	31	1.000
Yes or No	26	50.0	28	26	50.0	28	1.000
14) I already burned a lot by the sun, but now I protect myself. I am free from the risk of having skin cancer							
They do not know	8	40.0	31	12	60.0	31	0.277
Yes or no	8	53.3	23	7	46.7	19	0.890
15) What are the most frequent signs of skin cancer?							
High and shiny lesion	8	50.0	31	8	50.0	29	0.876
Black spot that grows, changes	8	57.2	31	6	42.8	29	0.640
Wound that doesn't heal	6	66.7	31	3	33.3	29	0.329
All options	9	42.9	31	12	57.1	29	0.316
16) What is the best way to avoid skin cancer?							
Protected sun exposure	26	51.0	32	25	49.0	31	0.191
Avoid direct contact	1	25.0	32	3	75.0	31	0.203
Proper nutrition	3	75.0	32	1	25.0	31	0.424
There is no way	2	50.8	32	2	49.2	31	0.974
17) Why is protecting yourself from sun exposure important?							
Because the effect is cumulative	21	53.9	31	18	46.1	31	0.430

Continued

Because of eye disease	2	50.0	31	2	50.0	31	1.000
Skin spots and wrinkles	0	0.0	31	1	100.0	31	0.313
All options	8	44.4	31	10	55.6	31	0.576
18) How often should I go to a dermatologist?							
Never	2	28.6	31	5	71.4	31	0,229
Only in childhood	2	100.0	31	0	0.0	31	0.151
Only if there is something wrong	5	50.0	31	5	50.0	31	1.000
Once a year	22	51.2	31	21	48.8	31	0.007
19) At what age should I start to protect myself from the sun?							
At 50	0	0.0	31	0	0.0	31	-
When you become an adult	2	100.0	31	0	0.0	31	0.151
From childhood	29	48.3	31	31	51.7	31	0.151
Only if you have skin cancer	0	0.0	31	0	0.0	31	-

The answers to questions 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19 were summarized.

Table 5. Statistical analysis of the educational program satisfaction questionnaire.

Questions	I disagree		I neither agree nor disagree		I agree		Total	
	Fi	fp	Fi	Fp	fi	Fp	fi	Fp
1) About the effectiveness of the methods used	0	6.5	16	51.6	15	48.4	31	100
2) Variety of materials that supported learning	0	0.0	10	32.3	21	67.7	31	100
3) The teaching materials were motivating	2	6.5	12	38.7	17	54.8	31	100
4) I had the opportunity to discuss ideas and concepts	0	0.0	2	6.5	29	93.5	31	100
5) Active participation	4	12.9	8	25.8	19	61.3	31	100
6) I felt at ease	5	16.1	6	19.4	20	64.5	31	100
7) I was able to expose my ideas	4	12.9	16	51.6	11	35.5	31	100
8) Hears enough opportunity to understand the purpose of the activities	0	0.0	14	45.2	17	54.8	31	100
9) The objectives were clear and easy	3	9.7	7	22.6	21	67.7	31	100

Another statistically significant change was related to sun exposure for intentional tanning. There was a decrease in the number of students who responded that they never intentionally exposed themselves to the sun, and an increase in students who responded to intentionally sunbathing rarely. This symbolizes students' awareness of sun exposure, who have come to consider the answer "Never" as unlikely.

As for knowledge, the educational program caused statistically significant changes in two questions: question three, about glass photoprotection, which obtained 100% of success and understanding to answer correctly, and question eleven,

whose percentage dropped from 73% to 26% of students who wrongly judged the correct amount of sunscreen. This shows that the educational program was assertive for this case.

Regarding the satisfaction questionnaire, more than 93% of students considered having the opportunity to discuss ideas and concepts during the educational program, which is an important matter in active teaching/learning methodologies, since the rescue of prior knowledge makes it possible to insert new concepts and knowledge reconstruction, which makes learning meaningful (Sousa et al., 2012; Sociedade Brasileira de Dermatologia, 2017b; Nova Zelândia, 2019; Likert, 1932).

The variety of materials presented, and the motivation generated were also items approved by more than half of the students, which effectively contributes to changing behavior and developing new habits (Sousa et al., 2012; Sociedade Brasileira de Dermatologia, 2017b; Nova Zelândia, 2019; Likert, 1932).

The active participation of students and the supportive environment were judged positively by more than 60% of students.

And the understanding of the objectives of the activities and their clarity and ease, were judged to be sufficient in 54.8% and 67.7%, respectively.

The students had difficulty in giving their opinion on: "The effectiveness of the methods", "space to present their own ideas" and "opportunity to clarify the objectives of the activities". In view of the satisfactory evaluation of the other items, it was considered that in this case, possibly, the questions were not very objective, generating difficulty in understanding.

5. Conclusion

We concluded that the educational program through active learning methodologies on skin cancer prevention sensitized students, promoted the use of sunscreen and the acquisition of new knowledge about photoprotection: the correct amount for applying sunscreen and the fact that glass does not protect against UV radiation.

The possibility of significant knowledge construction, based on interaction with peers and the teacher, using triggers, allows a positive influence on the development of healthy behavior (Alonso et al., 2020; Souza et al., 2018).

The strategies used in the educational program were evaluated as satisfactory by the students, promoting an opportunity for the construction of new knowledge, in a participatory way, in a welcoming environment, through motivating materials, following the precepts of active learning methods (Thomson, 2006; Guy et al., 2016; Lima, 2017); in addition to enabling greater student involvement and integration with the topic, raising awareness of new attitudes and the development of healthy habits in the prevention of skin cancer.

The potential of the educational program to provide knowledge and motivate the change of habits is a good justification for the inclusion of the proposed theme in the curriculum of schools in the city, or even in the nationwide, so that

more engaged teachers and students could improve the program and obtain better results.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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