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Child-to-child approach in disseminating the importance of health among children –A modified systematic review

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Abstract:

Health is a paramount issue in every society. Children's lives are more dominated by two main environments, which are the home and the school. Children's health is most affected when they encounter disease-laden environments; hence, schools have high influence in their health. Schools also serve as health promoting agencies and have a strong bidirectional relationship between a child's holistic wellbeing and education. Children are the best teachers who have the charisma to be influential change agents in reciprocating what is taught to them as healthy behavior. This paper is focused on the child-to-child approach in disseminating the importance of health among school-age children and the importance of molding them into change agents. The objective is to systematically review all literature works answering the question "Is Child-to-Child approach effective in disseminating health information's among school children?". Using critical appraisal skills program (CASP) framework and a data extraction form, articles were retrieved from different databases, including Scopus, CINAHL, PubMed, ProQuest, and EBSCOHost. These articles were published between 2003 and 2020. After critically appraising 85 articles based on the inclusion criteria, only 16 were found appropriate for addressing the purpose of this review. Major results of the review were that each of the studies had tested the effectiveness of the child to child approach using different health education topics such as prevention of worm infestation, eating behaviors, first aid measures, hand hygiene practices, importance of Vitamin A, and eye care. Studies reported that this approach empowered children with better health related knowledge and practice. This paper concludes that child-to-child approach plays an important role in disseminating health to children either as siblings, peer groups, and to parents.

Keywords:

Child health, child nutrition, education, health education, health promotion, school intervention

Introduction

WHO-UNICEF-Lancet Commission advocates to the nations that children should be the central point of our sustainable development goals, and hence, the commission in a compelling way emphasizes to protect the health rights and provide a happy and safe environment to live. The commission also recognizes these children as agents who are active to make their own decisions with

power to execute their rights of freedom to express, to live in dignity, and to hold a citizenship. Young people including children and adolescents are strong willed and self-motivated. Involving them into welfare-based decision-making will open way for making an egalitarian society, which thereby catalyzing one's ability to achieve a sustainable and healthy future.^[1]

Child-to-child approach exists but like a silhouette, it needs the required attention and promotion in the right direction,

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thereby empowering children and using their unique talents and energy in promoting better health practices and improving quality of life. Exemplary young children who attracted the global attention for their rights and the rights of the environment they live in are the Nobel Prize Winner Malala Yousafzai, Educational Activist Thandiwe Chama who is fighting for educational rights, Victor Ugo, mental health campaigner, and Vanessa Nakate, climate activists. These young people are noted for their unique characteristics and their civic sense towards responsibilities as humans. They were change agents who currently inspire children of their age as well as adults, which is nothing but the influence of child-to-child concept.^[2]

Child-to-child approach is an educational approach that allows children to be empowered as a group by participating in their self-development and the development of their peers.^[3,4] This approach was introduced in the curriculum in 1978 during the International year of the child.^[5,6] Its introduction as a learning activity originated from the fact how the older siblings played the role of teachers to their young ones, which is mostly a common site in the homes at most developing countries. The teaching materials that were introduced in this approach encompass the developmental needs of a child, nutritional needs, illnesses that affect children, and a suitable environment that enhances the growth of a child. Printings were done explaining the approach's activities and teaching methods.^[7] Innovations concerning this approach were highly regarded, as they would drive the skills required in promoting this approach concerning the needs of society. Today, the child-to-child approach is being used in more than 60 countries. World's large organizations such as the World Bank, UNICEF, and UNESCO were at the forefront in promoting this approach as they seek to enhance community education on healthcare. This was their mission to ensure health for all. Schools are the best places to have the skills development related to health practices and promote it through them to their families.^[8]

The first place where the child-to-child approach can thrive is where they can be found in a group.^[9] Finding children as a group can be associated with school environments, which is the most feasible environment to gather them together. In a particular class or grade, you will find children of approximately the same age. Having these children in school forms a better ground from where the child-to-child approach can be transmitted.^[10] The mode of teaching will allow these children to participate in activities actively that encourage them to live a healthy lifestyle while also helping their peers to learn these skills. It is worth to note that children learn quickly by copying the behaviors of their peers. They also like experimenting with

new things, new methods, interesting new concepts, and discussion topics. The healthcare teacher or an available school health nurse will impose instructions to these children to ensure that they are in the line of developing behaviors that translate to better healthcare practices.^[11] This approach was first used when the world was approaching the 21st century, and it is important to know the changes in health issues that it has brought to communities, especially in the developing nations.^[12] In most countries, older siblings take the role of taking care of the young ones while their parents are at work, which is nothing but a child-to-child relation. Though the current generation is more allured to the smart gadgets and smart learning, yet a child-to-child approach would still find a liking among the children when facilitated and organized well. Now with the world facing the threat of a Pandemic in the form of COVID-19, a lot of awareness is required to be emphasized. With such a drastic rise in cases and also similar rise in number of fake news spilled into the society through social media, it is essential to throw focus on children the most vulnerable groups. The initiative taken by PGIMER, Chandigarh to release a comic for creating awareness about COVID-19 on behalf of Government of India was one effort, which was appreciated for laying the road for strengthening a child-to-child concept to disseminate information on health.^[13] A child reading this material is sure to discuss it with her peer group, thus creating a web of peer groups who pass information and learn about it. The novelty of this review is that child-to-child approach has been reported as good school intervention to enhance and promote healthy behaviors and lifestyle, and this paper is the first of its kind reporting a review of the available studies. This research review aims at revealing the impact of the child-to-child approach in disseminating the importance of health among the school-age children.

Materials and Methods

Modified systematic review is considered as one of the best methods to appraise the available research evidences and provides conclusive answers to research questions than one study. To lead to an effective review and clarified search, the authors framed a PICO question. A review question must include the following elements like Participants of Interest, Intervention, Comparison, and Outcomes. The PICO used is outlined in Table 1. This review analyzed works of literature concerning this topic which used various research designs. Studies considered included those that followed quasi-experimental, experimental, randomized control trials, and cross-sectional surveys. Samples included school-age children who have successfully acquired and used this approach from their respective schools and how they applied this approach. Various sources of the literature review were used, including university's e-library, bibliographic search engine such as Google

Scholar and databases such as SCOPUS, EBSCOhost, PubMed, Science Direct, ProQuest, and Cumulative Index to Nursing and Allied Health Literature [CINAHL]. The search strategy was by using the MeSh key words and boolean operators like 'and', 'or' in the above-mentioned databases between the years 2003 and 2020. Two authors first sieved the articles by removing non-relevant articles, later all duplicating articles were removed too. Articles that were published relevant to the PICO question and inclusion criteria as in Table 2 were used as the primary source of information, and from those references, a bibliographic mining was done to trace further articles. The identified articles had a quality check by using the critical appraisal skills programme (CASP) checklist for screening randomized control trials and other cohort studies. The checklist has three screening questions to ensure that this review is worthy to be done followed by ten questions to appraise the quality of each chosen study in the review. A data extraction form was used to organize the obtained information from the research papers in Table 3. Search strategy is depicted using the PRISMA flow diagram as shown in Figure 1. Pooling of statistics for a meta-analysis was not possible with these studies as their methodology varied with different designs. Hence, the main results have been reported in tabular form in Table 4.

Ethical considerations

This systematic review does not include any human participation, and hence, an ethical approval was not from the College Research and Ethics Committee. However, the authors have tried to ensure and avoid any bias while retrieving and analyzing the articles. Plagiarism was avoided of any form while drafting the findings for this manuscript. In addition, a check was kept on any sort of ethical issues like data fabrication and falsification while writing this manuscript.

Results

On searching, we found 1317 articles were generated based on individual keywords, but not all were related to child-to-child approach. The authors divided the titles and did a sieving to first remove titles, which were far from relevancy and catered down to 208 articles that were somewhat close to the concept. Most duplicates were removed, and list narrowed down to

Table 1: The PICO strategy

PICO	Inclusions
Participant of Interest	School Children: Primary, Middle, and High School
Intervention	Child to Child Approach and Peer education (recent studies use child to child approach as peer group influence)
Comparison	Normal Learning methods
Outcomes	Improved Health Literacy, Changing Health Behaviors, and Faster Acquisition of Information.

85 articles. A thorough matching of articles with the chosen inclusion criteria paved way for generating articles that met the PICO. However, only 16 studies met the inclusion criteria and were analyzed. Results from the finally retrieved studies were included in the final analysis [Table 4]. These studies were conducted in different parts of the world. These studies touched on the relationship between teacher and students and how students learn behaviors and implement within students that is important for child-to-child approach.

The study characteristics are as follows out of the 16 studies: one study was cross sectional, 11 were experimental, three were pre-experimental with a pretest and posttest design, and one of them was a pilot study. All the study chose school aged children, four had primary school children, and the rest included middle and high school children. All included studies aimed to train peers on health components like healthy eating, first aid, prevention of worm infestation, hand hygiene practices, positive attitudes of breast feeding, eye care, importance of vitamin-A, dental health, and ear health.

Discussion

We conducted this systematic review in order to thoroughly assess the existing research and evaluate the effectiveness of the child-to-child approach in educating school-age children about the value of health. The studies with full texts available in English and papers published

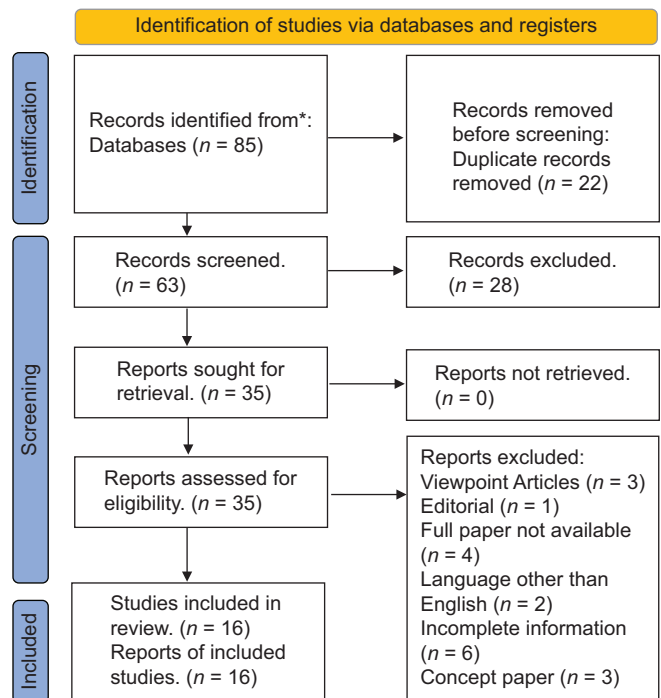


Figure 1: Flow diagram showing the PRISMA adopted from Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. Systematic Reviews 2021;10:89

Table 2: Inclusion, exclusion, and rationale

Characteristics	Included Study Details	Excluded Study Details	Rationale
Year Published	2003-2020	Before 2003	Publications within the past 20 years.
Language	English	Other Languages	Authors Fluency in English language and limited access to professional translating services.
Country	Any Country	No limitations	To explore topics from a global perspective.
Study Type	Primary Research	No brief communications, literature reviews, book chapters and concept-based articles	Since the aim is to review original studies only.
Methodology	Quantitative Studies	Qualitative Studies	Since it is outcome based.
Research Question	Studies meeting inclusion criteria and PICO.	Studies not meeting inclusion criteria	To ensure rigor in the review.

Table 3: Data extraction form

Publication
Year of Article Published
Language
Country
Organization of Sponsor/funding
Setting
Aim
Methodology
Sample Size
Ethics
Inclusion Criteria of Participants
Exclusion Criteria of Participants
Results

from 2003 to 2020 that discussed the child-to-child approach in primary, middle, and high school students with health literacy and health behaviors were included in the review. This review includes a total of 16 studies that met the inclusion criteria. The main characteristics of the included studies are presented in Table 2.

All the included studies demonstrated an improvement in children’s health literacy and health behaviors, even though the studies’ end measures varied. Child-to-child approach was found beneficial in helping children acquire health information. Since this is a child-led learning system, children take charge of their learning.^[14,29] This means that children benefit as they come up with their ideas about healthcare information they are learning about. Therefore, the child-to-child approach is essential in bringing about innovations of new techniques of disseminating health information that would be beneficial for their health because children are agents of their own learning.^[30] If they are nurtured earlier in childhood, they will grow up coming up with readiness to enhance their quality of life that improve their health.

Child-to-child approach is un-pressured. This means that children are not forced to understand a given subject.^[31] In the long-run, the children will not get frustrated for failing to understand some of the lessons, which may not only be health related but as well as their normal schooling. However, they will have much interest in the

subject under discussion. Having an interest in the issue means that they will have much ease in understanding and putting into exercise what they have already learned.^[10]

The child-to-child approach also relies on the environment that the children are put in.^[32] When learning about health information at school, their teacher will create an environment that encourages children to learn and adapt to it.^[33] Children will take this environment with them to their homes. They will act and do what they were doing at school. This is a vital learning activity as children.^[34,35] This way, they will put into practice the healthcare lessons they learned at school. Hence, they will have fully benefited from the healthcare information they acquired.

Also, the child to child approach is important in fostering a love of learning in children. Although the learning process is controlled, children have the freedom to exercise their thoughts towards the direction they are given.^[36] The aspect of freedom is vital in the development of interest in learning. Children love to be appreciated, and when they do well, they get congratulated.^[37] Therefore, they will like repeating activities that make them joyful when the teacher and fellow children commend them. Also, the other children copy these actions for them to be rewarded. In the end, children can adapt the skills that please their teachers. Since these skills are behaviors that portray their understanding of the health information, they will have understood what the teacher intended to teach them.^[38]

Teachers as health trainers need to undergo specialized training programs to empower themselves with health literacy and in return train children at schools. Such children quickly absorb into their responsibilities, portray themselves as responsible change agents, and initiate child led health-based teaching.^[39] One of the studies assessed the impact of child-to-child approach educational method on knowledge and practices among primary school children. To boost children’s health, the study advised using cutting-edge health education techniques while teaching first aid to students in primary schools, as well as to children and their moms and the community.^[17]

Table 4: Literature review table of studies using the Child-to-Child approach

Authors (Year)	Research objectives	Research design	Sample size	Findings/Results
Mwanga JR, Jensen BB, Magnussen P, Aagaard-Hansen J (2008) ^[11]	This study tested the feasibility of a participatory approach with students as change agents in a community school in Magu district.	Cross Sectional Study	306 samples participated in the data collection	The results of the in structured interviews were analyzed and reported as the method was well accepted and was favorable among children who were participants. Child to child Approach is a feasible way of disseminating health education to children.
Onyango-Ouma W, Aagaard-Hansen J, Jensen BB. (2005) ^[14]	The aim of this study is to empower children to be the health change agents in the community	Quasi-experimental study design was used in this study	The study population consisted of 80 schoolchildren and 40 adults (parents/guardians) living in two villages surrounding the schools. Age range for schoolchildren was 9–15 years and adults 24–68 years.	Significant improvement in knowledge was detected in all recipient groups. Behavioral changes were more evident among the children than among the adults. The impact of the project was reflected in concrete changes in the school environment as well as the home environments. This study demonstrates children can be empowered to be health change agents in the community. Action-oriented and participatory health education intervention approaches have the potential to enable schoolchildren to assist their peers and parents to acquire health-related knowledge and changed practices.
Leena K.C. & Sr. Jacinta D'Souza. (2014) ^[15]	The aim of this study is to compare child-to-child approach to the traditional approach on health education about worm infestation.	Quasi experimental research design	100 primary school children from four schools of Mangalore were selected. Cluster sampling technique was used 0.50 children were assigned in each group.	The study found a significant improvement in the mean knowledge scores of children in Child-to-Child group. The child-to-child approach was effective than the traditional health education.
Mohammad Hossein Kaveh, Zahra Khaksari Nejad, Mahin Nazari & Haleh Ghaem. (2016) ^[16]	The aim of this study is to evaluate child-to-child approach based on the Theory of Planned Behavior (TPB) in school age children in Iran on their eating behaviors.	Quasi-experimental, interventional study with pretest/posttest design	173 students of public elementary schools were selected. Multistage random cluster sampling techniques was used for sample selection.	The results showed a significant difference between the intervention group & the control group in the mean scores of attitude, perceived behavioral control, and behavioral intention before and one and six weeks after the intervention. The child-to-child approach was an effective method in correcting eating behaviors among children.
Azza Abd-Elsema Elewa & Amany Mohamed Saad. (2017) ^[17]	The aim of this study was to understand the impact of child to child approach and educational method on knowledge and practices of selected first aid measures among primary school children.	A quasi-experimental research design	460 samples including boys & girls participated. A multi-stage random sample was done. Two schools were selected, 8 classes of grade five & six students aged between 11-13 yrs. Each class consists of 55 to 60 children.	There was statistically significant increase in mean scores of all items as well as the total score of knowledge and practices after application of the child-to-child approach. Child to child concept enhanced children's knowledge and adequate practices related to first aid measures.
Ms. Anju Mary Rarichan, Rev. Sr. Mony. K, Prof. Dr. Sheela Shenai N.A & Mrs. Preetny Jawahar. (2018) ^[18]	The objective of the study was to evaluate the effect of child-to-child approach on hand hygiene practice among primary school children.	Pre - experimental one group pre-test post-test design	70 primary school children between the ages of 8 to 11 years. Non- probability convenience sampling technique was used.	A significant difference was observed in the post health education knowledge scores. There was a significant improvement in the knowledge level of the children in both the traditional health education technique and child-to-child approach of health education. The findings reveal that child-to-child approach is an effective strategy to improve the hand hygiene practice of primary school children.
Sunderraj SEJ. (2020) ^[19]	The aim of this research was to evaluate the effect of child-to-child approach in teaching children about the importance of Vitamin A.	Pre experimental one group pretest/posttest No control group design.	Sample obtained was 90 with 18 change agents and 72-peer group.	Study results shows that the mean posttest is higher than the mean pretest. There is a significant knowledge gain of the peer group regarding importance of vitamin-A by the use of child-to-child approach. The findings reveal that the child-to-child approach is a feasible and an interesting method to get school children to learn about health. This approach was found to be effective in improving the knowledge of students, which is evident by the scores statistically.

Contid...

Table 4: Contd...

Authors (Year)	Research objectives	Research design	Sample size	Findings/Results
Melanie Giles, Carol McClenahan, Cherie Armour, Samantha Millar, Gordon Rae, John Mallett & Barbara Stewart-Knox (2013) ^[20]	The aim of this research was to evaluate the effectiveness of a school-based intervention designed to enhance young people's motivations to breastfeed.	Cluster randomized controlled trial	42 post-primary schools across Northern Ireland participated in this study. Average class size was 17 pupils' with 13-14 years of age, comprising 698 participants in total.	There was an increased female students' intentions to breast feed, expanded their knowledge about awareness of breast feeding and led to more favorable attitudes and perceptions of social norms. The intervention of TPB was effective. This study has provided evidence to support the efficacy of the TPB in the design and evaluation of a school-based intervention to promote positive attitudes to breastfeeding
O.O. Ayorinde, G.V.S. Murthy and O.O. Akinyemi (2016) ^[21]	To understand if children aged 9 to 14 years could be used and trained to assess vision using Snellen chart and refer cases for further treatments.	Pilot study, Experimental Approach	90 students were selected and proportionately allocated between two schools. The chosen samples were subjected to intensive training.	A pretest and posttest survey was conducted for the selected children and there was a significant increase in the score, which was posttest. There were differences between the schools they were selected from. These students in return performed the vision test and referred around 386 people from both schools for a vision test.
Muneeswari, B (2014) ^[22]	The study used child to child approach to impart first aid training and see its effectiveness.	Quasi Experimental Study	200 students were selected from different schools as samples and trained in the topic.	Training children using child-to-child approach brings about a change and can be a supportive concept to perform health surveys too. There was significant increase in the knowledge among the students as evidenced in the hike in the post test score. Child led learning has impact in bring about change in children and learning health related concepts.
Parminster Kaur, Kaur Mal Hardeep, Bhupinder Kaur (2019) ^[23]	The main aim of this study is to assess the effectiveness of child-to-child approach on knowledge and practices regarding hand washing among the primary school children.	Quantitative approach with one group pretest-posttest research design was used in this study	Simple random sampling technique was used to select the samples. 100 schoolchildren from 3rd, 4th and 5th classes were selected and 10 students as leaders. The selected students were given intervention about hand washing and these students thought all study subjects	Posttest mean score of knowledge was 15.2 respectively which was significant at $P < 0.05$, similarly posttest mean of hand washing practices was 10.41, which was significant at $P < 0.05$ level. Child-to-child approach is an effective intervention to raise the level of knowledge and improve the practices of hand washing
George Ancy D, Ram R Anupama, Joy Sheeba, Simon Sneha and Thomas Soly (2018) ^[24]	The main aim of the study is to evaluate the effectiveness of child-child approach regarding personal hygiene among peer group of upper primary classes.	Quantitative approach, one group pretest-posttest research design was used in this study.	Sample size consists of 70 upper primary school children, out of which 60 students were selected as experimental group by purposive sampling, 10 students selected as trainee group by convenient sampling.	The mean score of posttest is greater than pretest, so the child-to-child approach among personal hygiene is effective in upper primary school children. Child-to-child approach is an effective intervention to raise the level of knowledge and improve the personal hygiene practices.
Kumar S.N. Praveen, Ambika K and Williams Sheela (2018) ^[25]	The aim of this study was to assess the effectiveness of child-to-child teaching program on prevention of hookworm infestation among school children in a selected rural government school.	Pre-experimental One group pretest posttest design was used in this study.	50 schoolchildren were selected using Probability random sampling technique.	The study results revealed that there was significant difference between the mean pretest and mean posttest knowledge scores which was statistically tested using paired 't' test and it was found to be significant at 0.05 level of significance ' $t = 26.7, P < 0.05$. Child-to-child teaching programme was effective in increasing the knowledge of schoolchildren regarding prevention of hookworm infestation.

Contd...

Table 4: Contd...

Authors (Year)	Research objectives	Research design	Sample size	Findings/Results
Ruth Freeman and Grace Bunting (2003) ^[26]	The aim of the study was to assess the effectiveness of child-to-child approach to promote healthy snacking in primary school children.	Randomized controlled trail design was used in this study	Out of 55 schools of North and west Belfast, 10 schools were randomly selected. 482 children participated in this study.	The mean knowledge scores were greater in older intervention children compared with control children. The mean cariogenic snacking scores had greater decrease in older intervention children compared with control children. Younger children attending higher socio-economic status schools had significant decrease in mean cariogenic snacking score compared with children attending lower socio-economic status schools. Child-to-child approach provided a path to dental health knowledge. It also help to modify their snacking habits during school break-time.
P.R. Walvekar, V. A. Naik, A. S. Wantamutte, M.D. Mallapur (2006) ^[27]	The aim is to assess the impact of Child-to-Child programme in increasing the knowledge, change in the attitude and practice with respect to diarrhea among rural schoolchildren.	Randomized controlled trail design was used in this study	54 students in study group and 54 students in control group belongs to VI class in Government primary schools in two villages.	The study results showed that positive attitude was observed among study group children with pretest score of 1.24 ± 1.36 to 2.96 ± 0.27 ($P < 0.0001$). No such change was observed in the control group. Child-to-Child programme has resulted in significant improvement in the knowledge, development of positive attitudes and healthy practices among study group students
Rekha Sonavane, Deepthi R, Rashmi Rodrigues, Chikkaraju and Rathna Kumari (2012) ^[28]	The aim of this study is to evaluate the impact of health education in improving the knowledge of school children regarding ear health and to compare the effect of the Child-to-Child approach for health education with the Adult-to-Child approach.	Interventional study	212 children from 6th and 7th standard were randomly divided into 2 groups. Group A, 105 children for the Child-to-Child approach (CTC) while Group B comprised of 107 children for the Adult to Child approach (ATC).	Greater improvement in mean scores was observed in Child-to-Child approach in comparison to the Adult to Child approach. Children were as effective as adults for the dissemination of knowledge to other children and can be effective change agents in ear health.

This review establishes facts that support and recommend the child-to-child approach in disseminating the importance of health among school-age children. It suggests that this approach continues to benefit peer circles, families, and societies concerning health requirements. One of the studies demonstrates how children can be given the tools they need to influence community health. School children may be able to support their peers and parents in acquiring health-related knowledge and changing their habits by using action-oriented and participatory health education intervention approaches.^[14]

Children are the future of every nation and the strong pillars of a country. Bringing back this concept to thrive will help handle situations like pandemic by facilitating the faster spread of health information and awareness at all levels especially among children who are more volatile. A cross-sectional study conducted in Thailand among 9–10 years aged children concluded that about 85% had excellent and adequate levels of health literacy. Sociocultural aspects and knowledge on health had influence on children's health literacy. Targeting children and adolescents with health literacy interventions help to maintain a healthy behavior.^[40] A similar study conducted among 377 girl students revealed that problem based learning (PBL) on health literacy and practicing real-life scenarios can improve the adolescent lifestyle.^[41] Children being used as a change agent is influential in bringing about health awareness and health disorder prevention in immediate families and on a largescale in the society, which leaves a significant mark on the global health.

More research studies should be done in future having child to child approach as an intervention to cover various health related topics and integrate healthy behaviorally changes through peer group influences.

Conclusion

Child-to-child approach is a child friendly, cost effective method of disseminating healthy behaviors. It also builds in children a sense of responsibility, teamwork, and instills leadership qualities too. Children of any age group will benefit from this method, and the teacher mostly plays the role of a facilitator to ensure that the information is being disseminated accurately among the peer groups. The method paves path for a healthy environment and healthy generations.

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Conflicts of interest

There are no conflicts of interest.

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