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EMPOWERING EDUCATORS FOR A HEALTHIER FUTURE: ENHANCING ENVIRONMENTAL EDUCATION CAPACITIES IN SCHOOLS FOR IMPROVED WELLBEING

SALMA KHALID *
Prime Institute of Public Health, Prime Foundation, Riphah International University, Islamabad, Pakistan.
*Corresponding Author Email: anagalious_79@yahoo.com, ORCID ID: 0000-0002-8697-3457

MUHAMMAD AMAN KHAN
Department of Community Health Sciences, Peshawar Medical College, Prime Foundation, Riphah International University, Islamabad, Pakistan.

ZIA-UL-AIN SABIHA
Department of Community Health Sciences, Peshawar Medical College, Prime Foundation, Riphah International University, Islamabad, Pakistan.

FARHAT R MALIK
Department of Community Health Sciences, Peshawar Medical College, Prime Foundation, Riphah International University, Islamabad, Pakistan.

NOWSHER YOUSAF
Department of Environmental Sciences, University of Peshawar, Khyber Pakhtunkhwa, Pakistan.

JAVAID IQBAL *
Department of Environmental Sciences, University of Lakki Marwat, Khyber Pakhtunkhwa, Pakistan.
*Corresponding Author Email: drjavaidenv@gmail.com; j.iqbal@ulm.edu.pk,
ORCID ID: 0000-0001-6349-888

Abstract

A thriving society requires favorable environmental conditions, safe drinking water, and adequate sanitation and hygiene. The current generation finds itself amidst challenging environmental circumstances, both within and outside schools, negatively impacting the physical and mental well-being of students. The research aims to enhance the environmental education capacity of school teachers to promote environmental protection and address climate change. Separate four-day training sessions were conducted for public and private school teachers, randomly selected from the pool of science teachers. Pre- and post-study assessments were administered to measure the knowledge gain, serving as a predictor for the immediate outcomes of the study. The participants in the training sessions exhibited an average knowledge improvement of 54%. As indirect beneficiaries, the project is anticipated to positively impact 13,269 students and 598 teachers. It is expected to aid policymakers in integrating environmental and health considerations into policy formulation.

Keywords: Environmental Education; Teachers Training; Environmental Impacts; Student's Health; School Settings.

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INTRODUCTION

Schools are considered to be important platform for improving environmental quality and teachers are real change agent by bringing attitudinal and behavioral changes in the students, peers and his own self towards environment (Bergman, 2016; Ernst, 2009; Evans et al., 1996; Gayford & Dillin, 1995). They provide a vital link in the delivery of environmental education by preparing the students to make well-informed decisions in regard to the negative consequences of anthropogenic activities and climate change mitigation and adaptation capacity of the communities in the future (Reid, 2019). If teachers is not proficient in environmental knowledge, attitude and skill, it is improbable that they will be able to effectively lead environmental change in schools settings (Council, 2005). However, this education can be effective when it is based on life experiences gained in the early years of life, because it triggered a complete change in an individual's outlook on environment during school age life (Shobeyri et al., 2007).

According to the National Center for Education Statistics (2011) about 55 million children worldwide spend 6-7 hours/day (Hussar & Bailey, 2020; McDowell et al., 2014) and approximately nine months of the year attending the school , in which about 10 % are medically found unfit due to their unhealthy physical environment (US National Center for Health Statistics (1998-2006) (Wilper et al., 2009). Children, the most vulnerable population are not free from threats and hazards of environment in the schools. According to the charter of human rights "every child has the right to learn and grow in a safe and clean environment". Besides of air, water and soil pollutions, the growing rate of industrialization, the burning of fossil fuels, deforestation and increased use of biodegradable materials has resulted in increased levels of CO2 into the atmosphere which in turn leads to climate change. Climate change could hinder the achievement of many Sustainable Development Goals, including those on poverty eradication, child mortality, diseases, as well as environmental sustainability and protection (Mochizuki & Bryan, 2015; Verlie, 2019; Wynes & Nicholas, 2017).

Not only small and developing countries are the worst sufferers in view of their inability to cope with the weather related disasters like flash floods, freak weather and hurricanes in the settled areas, it is also adversely affecting the developed countries as well. However, environmental problems and their impacts on human health are countless. Like other developing countries Pakistan has also been experiencing multitudinal climate induced disasters because of its topography with varying degree of loss to human and material as evident in 2010, 2011 and 2022 super floods (Rehman et al., 2012) and has been placed at number seven on the global climate risk list (Kreft et al., 2016). Key findings of the literature show most of drinking water samples in Pakistan were deteriorated with bacterial contamination (Sarwar et al., 2004).

A number of marble processing units are working across the country to meet the growing demand for marble as a building material for interior space and decorating walls. Most of them openly dump their waste in the nearby canal, which is being put on the road by the irrigation department particularly in winter season, resulting in creating dust on road

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(Iftikhar et al., 2009). This causes air pollution problems for the workers as well as for the inhabitants of the surrounding area. Furthermore, another cause of air and noise pollution is the presence of numerous educational establishments in a specific region, as well as large traffic loads used by various automobiles, including big and light vehicles, to reach their destination (Shah et al., 2013). Children who lived 100 meter or less from a major road highway experience most of the respiratory and psychological problems (Ising et al., 2004; Rice et al., 2016). Aside from that, there is a lack of a competent solid waste management system, from solid waste collection to proper disposal. Much of the uncollected waste poses serious risks to public health through clogging of drains and providing breeding grounds for mosquitoes and flies with consequent risk of malaria and cholera (Khattak et al., 2009). Furthermore, the persistent poor environmental conditions at school include poor ventilation, contaminated drinking water, unhygienic sanitation conditions, lack of greenery in the school area, schools proximity with the main road, air and noise pollution and lack of awareness regarding surrounding environmental issues and associated health problems among teachers and parents (Joshi et al., 2005; Suleman & Hussain, 2014). Considering the imperative need, a capacity building workshop for teachers and principals working in primary and high schools in district Peshawar has been arranged with objectives of; to enable school teachers/principals to identify environmental and climate change problems (local/school/ community) and particularly adverse health consequences. Further, to empower the teachers /principals to adapt activities and preventive strategies which enhance the environmental quality and reduce the adverse health effects particularly on children health, considering that they are tomorrow's leaders and resource users. It is believed that this training not only motivate and empower teachers to change their behavior and take action towards environmental protection into natural and local context but also be effective to influence policy-makers to include environmental and health education in planning and policy-making. According to Bush (2003), teachers are paramount in implementation of educational policies due to their strong position between practitioners and policymakers and can propose certain measures to improve the areas of weakness (Khanum, 2019). Similarly the manifestation of pro environmental behavior through environmental education is described by UNESCO (1978) as a learning process that increases understanding of the environment and the issues that surround it. It encourages motives, attitudes, and commitments to adopt responsible choices for responsible behavior and cultivates the skills and competence necessary to tackle the issues. Since the future of our planet rests in the hands of the next generation, teaching them to be more environmentally conscious is also crucial.

METHODOLOGY

The perceptions and knowledge of teachers towards environment related issues in real school settings were assessed by means of quantitative research method. The selection of teachers were made on the basis of purposive sampling. A total of 50 science teachers were selected randomly from 28 different private and public schools. Pre and post evaluations were conducted using a questionnaire, as well as close interaction with participants during face-to-face meetings. Participants were quizzed on their age, years

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of teaching experience, educational background and subject specialization. The training was restricted to basic concepts regarding the environment resources, types of pollutions like water pollution, air pollution, soil pollution, noise pollution, climate change, their environmental and health effects and health hygiene etc.

Aside from knowledge, different chart activities were carried out by dividing the teachers into groups (approximately 10 groups) at the end of each training session to measure their practice and attitudinal change, with a special emphasis on problem-solving approaches. Teachers were asked to identify environmental issues that were relevant to their students' daily lives or that were especially important to the school's premises or surroundings. The methodological framework used for training is displayed in figure (1).

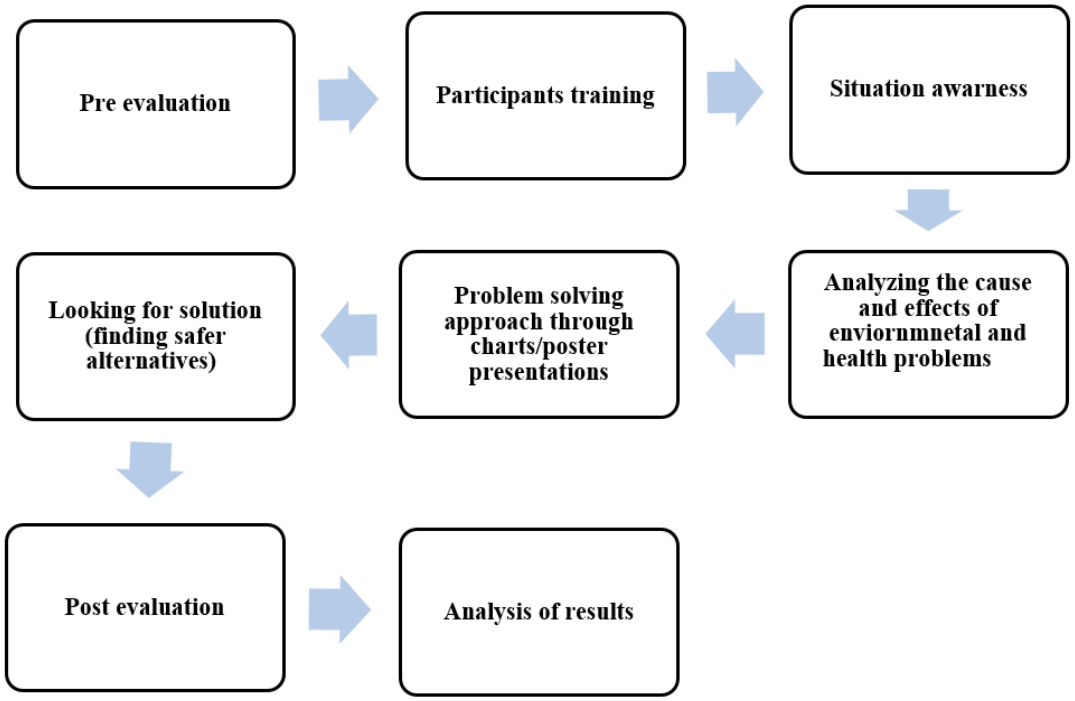

Figure 1: Methodology Framework of Training

RESULTS AND DISCUSSION

The capacity-building component of the study resulted in training of teachers and pre and post assessments were projected to test teacher's perceptions, awareness, and concerns towards the environment resources, types of pollution, climate change, students' health and hygiene. A total of 28 schools including public and private were engaged in the training, in which male and female participants were in total of 21 (42%) and 29 (58%) respectively (Table 1).

Table 1: General Characteristics of Participants (Teachers)

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General characteristics		Frequency (%age)
Age	21-30 Years	13 (26%)
	31-40 Years	20 (40%)
	41-50 Years	16 (32%)
	51- above	1 (2%)
Gender	Male	21 (42%)
	Female	29 (58%)
Qualification	High schooling	3 (6%)
	Degree awarding College	14 (28%)
	Post graduated from University	33 (66%)
Teaching experience	0-5 Years	21 (42%)
	6-10 Years	5 (10%)
	More than 10 years	24 (48%)

Of the participants 26% were between ages 21-30; 40% were between ages 31-40 ages; 32 % were between ages 41-50; and 2% were above 51 years old. From educational point of view, 6% of the participants have education from high school, 28% were graduated from degree awarding college while 66% were post graduated from university. Similarly, 42% participants have only 0-5years experience, 10% have 6-10 years teaching experience while 48% participants have more than 10 years' experience in teaching field.

Furthermore, the pre-test and post-test averages of answers given by participants regarding environmental resources, types of pollution, climate change, their adverse health consequences and health hygiene, showed that post-test averages have increased in comparison to the pre-test results and paired samples t-test were found statistically significant ($p<0.05$) as shown in the table (2).

Table 2: Participant's Pre and Post Evaluation

Group Statistics				Paired samples t-test			95% CI	
Groups		**N**	**Mean ± SD**	**t-value**	***P-value***	**Mean Difference**	**Lower bound**	**Upper bound**
Environmental resources	Post test	50	23.8±3.6	6.95	.000**	4.6	3.13	5.67
	Pre test	50	19.2±4.0					
Types of pollution	Post test	50	20.7±3.9	6.76	.000**	5.2	3.66	6.74
	Pre test	50	15.5±4.7					
Climate change	Post test	50	22.2±3.5	8.07	.000**	7.5	5.63	9.37
	Pre test	50	14.7±6.5					
Health effects	Post test	50	22.1±3.9	6.06	.000**	6.2	4.01	7.99
	Pre test	50	15.9±6.5					
Health hygiene	Post test	50	23.2±4.2	5.43	.000**	5.7	3.46	7.54
	Pre test	50	17.5±5.6					

The attitude and behavior towards the environment, awareness of environmental issues and set of proposed actions to solve the problem were assessed as well. Knowledge regarding environment is the leading component in raising environmental awareness. It determines how a person understands the reasons standing behind the environmental degradation on a global, regional and local scale, as well as the leading role of man in disturbing that balance. It was measured from the pre and post evaluation by dividing the

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whole score data (150 score) into three categories i.e. **unaware** (<50 score)**, somewhat aware** (>50<100 score) **and fully aware** (>100 score) about the environment and health problems as overall immediate impact of the training. On average 19.06% improvement in knowledge were recorded in training participants with significant *p*-value ($p<0.05$). Comparison between pre and post evaluation is shown in the figure (2) with 54% increase in fully aware category in post evaluation.

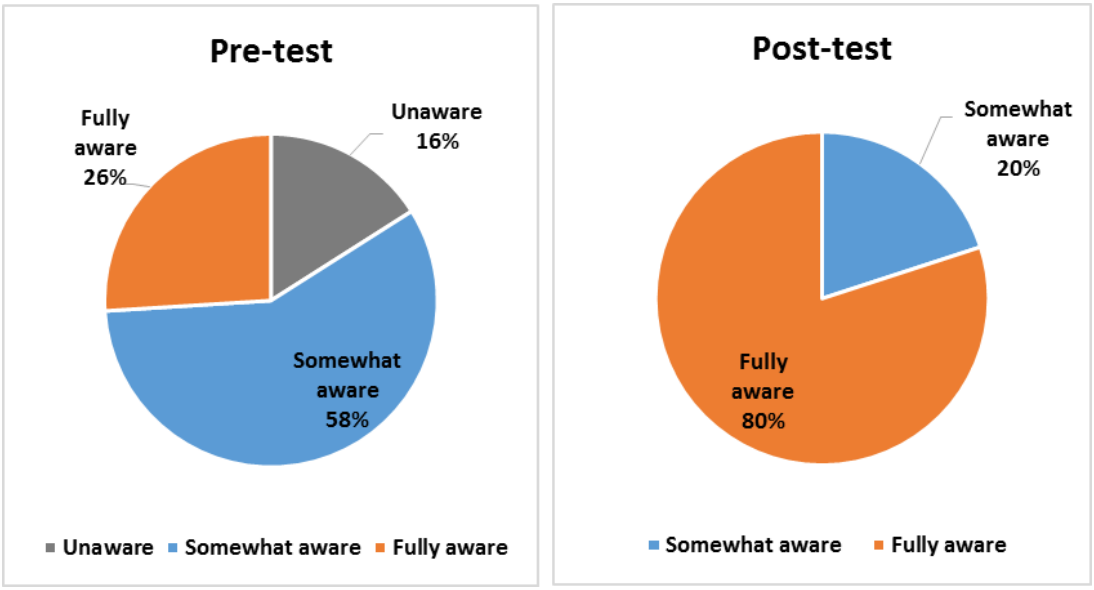

Figure 2: Comparison of Pre and Post- Test Evaluation of the Participants

These results indicates that participants were interested in training about the environment and health & hygiene and they found such training beneficial. Also the figure (2) showing that such training program proved effective in improving their knowledge level. In this context, (McBride et al., 2013) in their study clearly mentioned that only knowledge regarding environmental issues and problems is not enough, until teachers have no interest, mindset and skills to attempt to solve the problems. Similarly, Orr (2004) argue that communities can be made aware of their local environmental concerns and their detrimental effects on health, particularly on children's health, by utilizing a variety of learning methods and teaching tactics that incorporate a multidisciplinary approach.

Arif (2010) in his study suggests that proper attention and significance should be given to environmental education in academic institutions, by keeping in mind its relationship and effectiveness with daily life and local concerns.

Therefore for this purpose, at the end of each training sessions, different sheets and chart activity were also performed by trainees to ensure their practice and attitudinal change with special emphasis on problem solving approaches. They were encouraged to present the lessons to their classes in order to raise awareness, effect change, and, ultimately, to maintain their involvement in addressing these issues at school by assisting them in

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shaping and exercising control over their physical, social, economic, and cultural environments.

Furthermore, the project is intended to help 13269 pupils and 598 teachers in 28 schools (Table 3) as indirect beneficiaries.

Table 3: Direct and Indirect Beneficiaries of the Training

Beneficiaries	**Capacity building of selected school teachers**		
Direct Beneficiaries	**Target**	**Achievement**	**Percentage**
Teachers	50	50	100%
Indirect Beneficiaries			
Teaching faculty	- -	598	
Student	5000	13269	

The study will aid policy makers in considering environmental and health issues when formulating policies and allocating educational funding, as well as improve awareness among parents and the general public.

According to Higgs and McMillan (2006), when students observe their teachers involving in certain activities, they are most likely to adopt them. Similarly, Lee (2008) support this finding by stating that environmental education motivate and help students to develop more favorable attitudes towards environment. Boyes and Stanisstreet (1993) in their study mentioned that children are cognizant of environmental friendly actions and they may encourage the behavior of others in this respect.

According to the literature, teachers who are unable to connect the importance and protection of the environment to other aspects will be unable to urge students to protect and nurture the environment. According to the study of Sultan et al. (2020), that a well-trained teacher can successfully deliver and obtain excellent results. The study of Pigozzi (2007) suggested, adaptation of cross-curricular strategy for environmental sustainability, i.e. integrating ideas, subjects, problems, and challenges connected to the environment into all parts of learning. Aside from that, it will allow the teacher to consider environmental education approaches, components, aspects, and aims. During informal discussions, teachers addressed the importance of a proper environmental awareness curriculum in the formal education system, arguing that without such measures, there would be no element of interest in the classroom. A few subjects have been added to the elementary and secondary school curricula, but they have not been found to have an impact on students' environmental attitudes. Furthermore, for teachers, there is a dearth of guidance in the textbooks on how to teach these ideas in such a way that students become aware of environmental challenges and acquire attitudes, interests, and abilities in order to combat them (Khanum, 2019).

Teachers' training is critical in this regard, since it may help predict the quality of the students' work. "Many teachers in schools recounted efforts to convey the realities of environmental resources, their deterioration, and climate change whether or not it was an official part of the curriculum" as reported in the Harmon (2017) study.

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It has been seen that environmental education has been incorporated into school curriculum but does not have its own designated subject and is, therefore, most often integrated into other subjects like many topics such as energy, greenhouse effect, pollution, microorganisms, recycling, and ecosystems have been introduced into basic and secondary school science curricula. Furthermore, several environmental education themes are taught as part of content in various chapters of Urdu, English, Social Studies, and Islamic Studies textbooks at the basic and secondary levels. The environmental education information utilized in Pakistani text books is primarily derived from translations of foreign texts, which leads in a number of restrictions in terms of successful application of environmental education. Furthermore, a dearth of study into 'what students know' and 'what students should know' is leaving the issue of environmental education unanswered due to a scarcity of research on environmental education. According to a number of official documents (such as the Education Policy of Pakistan 1998-2010 and the Sustainable Development Stock Taking Report of Pakistan by the United Nations Millennium Development Year Goals), while the awareness of and even efforts for sustainable development are present in the documents up to the ministerial level, these issues are not given as much attention at the school-textbook level (Sharif, 1998). As a result of limited time and resources, as well as a competitive environment among private schools based on the grades of students, they claimed that, despite the fact that their teachers teach the concepts related to environment as presented in text books, students receive only theoretical knowledge (Khanum, 2019).

The evaluation system, an overloaded curriculum, a lack of resources, insufficient teacher training, and excessive class sizes are among the reasons given by participants in the research to comment on the tactics they use in the classroom. They all agreed that introducing interactive tactics to the classrooms would make ESD more enjoyable. Moreover, they expressed the view that students and teachers must assume new roles in order to properly understand these concepts. (Huckle, 2012) argues that our interaction with nature is fundamental to our self-identity, and that if teachers consider sustainability to be a "frame of mind," this could have wide-ranging educational benefits and allow the entire curriculum to be used as a vehicle for embedding environmental education could have widespread educational benefits.

CONCLUSION

The capacity-building component of the study resulted in training of science teachers in environment, climate change and health problems so that at the end of the training, each of them would be able to identify confronting environmental and health problems and to develop, implement and sustain their own solutions to problems in a way that helps them shape and exercise control over their physical, social, economic and cultural environments. Overall immediate impact evident from the pre and post evaluation by dividing the whole score data into three categories i.e. unaware, somewhat aware and fully aware about the environment and health problems. On average 19.06% improvement in knowledge were recorded in training participants with significant *p*-value

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($p<0.05$). Comparison between pre and post evaluation, with 54% increase in fully aware category in post evaluation. Not only change in the behavior of the teachers but also improve teacher personal and societal life. It will also affect those who directly or indirectly involved in creating policy and implement the actions that flow from Government departments, regional education authorities, school board/council members, school directors, principals, head teachers, advisors, social workers and school health coordinators. In fact, it also empower the students to participate in meaningful environmental activities and projects beyond the confines of a syllabus or curriculum. In addition, students will take sustainability messages homes which will have indirect influence to engage their parents and neighborhood communities to promote sound environmental behavior.

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Disclosure Statement

The authors declare that they have no conflict of interest.

Ethics Statement

As the current study did not involve the use of sensitive or confidential information from participants, ethical approval from an ethics committee was deemed unnecessary.

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