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Resilience dynamics after interventions made among school children of rural Ethiopia

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Abstract

Objectives of this study are to evaluate the impact of interventions on school children resilience and well-being; assess sensitivity of resilience evaluation tools; and identify shift in resilience among children in poor rural communities of Ethiopia. Qualitative and quantitative data are collected using semi-structured Pre- and Post- Interview Analysis (PIA), child and youth resilience measure (CYRM) and mental health continuum (MHC) questionnaires among the control and intervention groups. The study identified that PIA questions were not sensitive enough to detect all child resilience indicators. Resilience intervention has brought important positive change on most of the resilience indicators. However, no significant improvement observed on problem solving skills, and avoidance of troubling thoughts and feelings. However, the qualitative finding showed that children improved problem solving skill, such as intervening early marriage, avoiding physical abuse, and supporting needy children. In addition,

integrated interventions have brought substantial resilience impacts on children school performance, their interaction and social relations. Besides, integration of parents, teachers and community has brought significant change on the result of child resilience and well-being. Younger children under intervention showed lower resilience and well-being score compared to the older ones. Shift of resilience between male and female was observed when compared between the control and intervention groups. In the control communities, female students are more resilience and psychosocial well-being than male students. On the other side, among intervention groups, males showed better resilience than females. This suggests that context specific resilience intervention by gender could be necessary among school children of East Gojjam and similar communities.

Keyword: Psychology

1. Introduction

Ethiopia, with more than 82 ethnic groups, is one of the oldest nations in the world. Based on the United Nations population projection, the country has over 109 million population which ranked it 14th from the world [1]. On the contrary, it is one of the least developed nations of the world [2]. Most of the population is living in rural areas where the main means of livelihood is agricultural activities, mainly farming and livestock rearing. For the last 27 years, the Ethiopian politics maneuvered by the Tigray Peoples Liberation Front, where ethnic federalism became main tool to disrupted ethnically interwoven society, specifically the Amhara people. The political arena was crafted to benefit the minority ruling elites while majority of the society was living in devastating poverty and internal displacement. This has resulted countrywide movement and upraise that has replaced the leadership with broadly accepted leader.

Many infrastructures are built to provide various services such as irrigation, transportation, trade, education, industry, and health. Elementary education is mandatory, though accessibility and school dropout is a major problem which is mainly due to child labour and distance of the elementary schools [3]. Rate of entry to grade 1 is lowest in Amhara region, while the grade 4 completion rate 30%. Tigray region has the highest entry and grade 4 completion rate compared to all ethnic based regions. Water, sanitation and hygiene coverage of the country is also the lowest from sub-Saharan African countries where fecal borne diseases are prevalent [4]. These challenges contribute and play major role in diminishing the resilience of societies, specifically young age groups.

Resilience is an important life skill to cope up from different shocks, stresses and obstacles which is one of the key ingredients of success in life [5]. There are different

resilience challenges. Resilience of school children in a poor society is compromised by different problems. These problems are mainly illnesses, inaccessibility of schools, harmful traditional practices, change in family make up (divorce, break up), conflict with peers, conflict with family, physical punishments and harassments. Resilient people are comfortable in talking and expressing emotions and coping to different shocks and stress [6]. Currently, many organizations have interventions on community resilience building programs targeting different vulnerable groups.

In most parts of developing countries, children have burden that result different shocks and stresses. Such problem is worse among illiterate rural communities where children's rights are hardly understood and implemented. No country or society is immune from child abusive acts [7]. Parents often do not know how to entertain children's right, rather abuse them until they become independent. Such problems make children to not properly attend schools, to leave their parents and migrate to urban areas, or to be employed in other households to earn money. Some of these acts make children independent from abusive parents and community which in turn results further severe mistreatment and child labor exploitation [8]. On the other side, elementary schoolteachers do not know how to handle children at school and engage parents in the teaching learning. This again affects children performance because of high school dropout and lack of family support [9]. This has attracted different international and local nongovernmental organizations to intervene to the build-up of children resilience and well-being using different approaches.

In 2010, the Psychosocial Center of the International Federation of Red Cross and Red Crescent Societies and Save the Children Denmark developed a nonclinical psychosocial and protection method called the Children's Resilience Program (CRP) [10]. The program focuses on building children's positive coping strategy and resilience development settings under different shocks and stresses. Resilience intervention can be implemented during or after natural or man-made disasters, during (armed) conflict, and during families and community displacement. In addition, poverty-stricken communities with high rates of crime, substance abuse, and alcoholism also receive resilience interventions. Besides, such intervention is important to communities with high rates of illness and death because of epidemics or lack of access to health care or where there is a high number of vulnerable children and youth [11].

In Ethiopia, Save the Children is working on health and nutrition, education, child protection, child right governance and child poverty (livelihood) in all regions of Ethiopia. Since 2015, this organization has been working on a project entitled 'Create Enabling and Supportive Environment for Children' in the Amhara Region of Ethiopia to improve resilience and well-being of children.

The results of the project depends on the content of intervention as well as the resilience measuring tool. There are different resilience measurement tools

depending on intervention objectives and intervening organization. For example World Food and Agriculture Organization (FAO) uses RIMA, Mercy Corps develop and apply Strategic Resilience Assessment (STRESS) [12], and ResilientAfrica Network (RAN) combined principal component analyses with structural equation models to evaluate resilience [13]. Child and youth resilience measure (CYRM) is used by many organization working of child well-being. This tool is validated for its reliable resilience measurement depending on community type [14, 15]. Validation of resilience measurement tools is strongly recommended for reliable assessment outputs [16].

This study aimed to evaluate the change on resilience and well-being among school children in East Gojjam of northern Ethiopia after interventions made by Save the Children International and Facilitators for Change (local NGO). Meanwhile, the study evaluates the applicability of CYRM and mental health continuum (MHC) questionnaires that are used for measuring resilience of children. In general, this study answers the following three research questions.

- Is there change in resilience among the school children who received resilience intervention?
- Are there resilience shifts before and after intervention among male and female target groups?
- Are the CYRM and MHC tools relevant to assess the resilience outcome indicators among school children that received the intervention?

2. Materials and methods

2.1. Design

Cross-sectional study conducted in randomly selected six intervention and three non-intervention primary schools (grade 1–8) in East Gojjam zone. In this zone, there was an intervention by Save the Children to improve resilience and well-being of school children. Before the intervention, a master training was given to 19 Save the Children International (SCI) and partners staff on child protection and resilience concepts, on how to provide psychosocial support, on facilitation skills, familiarization with monitoring and evaluation tools and documentation, community mobilization, and intervention manual review. Following this master training, 84 (33 were females) facilitators took the first training for six days with close support of SCI and Save the Children Denmark (SCD). In 2016, 55 (18 were females) participants took the second-round of facilitators' training (individuals who have direct contact with children to carry out the resilience intervention). Trainees were teachers, rural adult education trainers and para-social workers who are residents of the locality. Willingness to facilitate child resilience interventions; level of commitment to provide the training; having enough time to voluntarily run the intervention; experience

on facilitating child focused activities; and have no known child abusive records were facilitators selection Criteria.

Trained facilitators recruited school children for resilience and well-being intervention. Children considered for training were those who are identified as no sufficient support from the family, children from very poor family, children who lost their parents, children whose parents are divorced, children with disabilities, children with very low school performance, and any child considered for support by school teachers or community social workers. The resilience intervention was given to group of school children having 25 members. In total, about 3,117 (1,777 were females) children with 120 groups were registered and successfully completed fifteen weeks workshops (one workshop per week on average). Age of children under intervention were 10–15 years, where 50% are females. Program implementation started phase by phase where accessible schools given priority.

2.2. Study area

The study was conducted in primary schools of East Gojjam zone. Resilience intervention programme was implemented on 40 elementary schools in four districts of the zone. Resilience measurement among control and intervention school children was made using CYRM and MHC assessment tools. Control school children were from elementary schools where the resilience training and related intervention activities were absent. In addition, pre- and post-intervention assessment (PIA) was made among all schools under intervention [17]. Hence, all the data recorded from 40 intervention schools were used for PIA analyses. This assessment tool was developed by SCD and IFRC to evaluate the change in resilience using the five resilience indicators, namely; *troubling thoughts and feelings, home environment, school environment, problem solving, and social relations*.

2.3. Data sources

2.3.1. Qualitative

Key informant interviews (KIIs) were one of the qualitative data source of this study. Application of similar guiding questions was compulsory to collect similar information and make comparisons between groups [18]. This was possible by employing interviews that allows easy aggregation of responses across respondents. Facilitators, social workers, school directors and teachers were the key informants. These key informants were interviewed about the program and major changes observed among school children and parents or caregivers that took part the resilience interventions. For the control arm, social workers, teachers and school directors were interviewed about the status of school children in relation to the five resilience outcome indicators [17].

Focus group discussions (FGDs) were the other qualitative data collection strategy. FGD guides were used to collect information which were not captured by the quantitative interview. From the intervention sites: 5 FGDs of parents/caregivers, 5 FGDs from school children (using friendly discussion techniques), and 5 KIIs were made. Among the control group: 3 FGDs of parents/caregivers, 3 FGDs of children, and 3 KIIs were the qualitative data sources. KIIs were facilitators, school directors and teachers. Children under intervention and control group were asked to discuss and reflect on the questions and points (See Supplementary File). The group discussion was interrupted after information saturation was assured. The FGD took an average of 80 min.

2.3.2. Quantitative data collection

Quantitative data were collected using semi-structured Pre-and Post- Interview Analysis (PIA), CYRM and MHC questionnaires. The PIA data were collected before and after the resilience interventions.

Structured questionnaire of CYRM [18] was used to collect and measure resilience data of school children aged from 10-15. Out of the 36 questions, 28 of them were CYRM and the remaining 8 questions were MHC. The CYRM-28 measures resilience while the MHC measure well-being. Therefore, both changes in resilience and well-being measured using questionnaires of CYRM and MHC. Experts recommend that CYRM and MHC should be adopted considering the cultural and contextual relevance of the community under intervention [18]. CYRM and MHC data were collected from 170 and 66 school children from intervention and control schools respectively.

PIA was used to measure changes in psychological well-being [17]. The PIA consists of structured questionnaires and analytical tools and aims to track change in children's well-being in a simple and feasible manner. The questionnaire consists of 15 questions that were tested before and after children took part in the resilience intervention program. In the PIA process, the change in psychosocial well-being was measured using five indicators listed below:

- *Troubling thoughts and feelings*: Relates to levels of anxiety, calmness and sense of security.
- *Increased Problem-Solving Skills*: Relates to increased problem solving skills, risk reduction behaviors, age appropriate autonomy, initiative, curiosity, exploration and self-regulation.
- *Supportive Home Environment*: Relates to improved relationship with parents, contribution to household responsibilities.
- *Supportive School Environment and Engagement in School*: Relates to positive learning attitudes and strategies, improved relationship with teachers.

- *Increased Social Skills and Environment*: Relates to pro-social values and behaviors with peers and nonfamily adults, reciprocated social and community support, increased self-expression.

Each of the indicators were measured through a set of three questions as mentioned in IFRC monitoring and evaluation toolbox [17]. It is important to note that the PIA tracks changes in the indicators of well-being and resilience for the group as a whole, and not changes for individual children. This is because, the intervention program based on the five indicators was aimed to influence; firstly the intervention groups (those selected school children and their parents), secondly the school community as a whole, and thirdly the society under intervention. Besides, interpretation of PIA was in terms of the respondent reaction against each indicator as a group. Hence, none of the PIA results reflect individual resilience and well-being. All the pre- and post-interview were conducted at the beginning and end of each child resilience workshop. Hence, a total of 1768 PIA data were used this study from reports recorded made before and after resilience interventions were made from all the 40 intervention schools.

2.4. Analysis

Information obtained from FGDs and KIIs were coded and thematised in relation to the five resilience indicators/dimensions. Participants' information were triangulated with the quantitative data along with the resilience indicators.

Data from PIA and CYRM, were entered, cleaned and analyzed using SPSS for Windows version 21. Factor analysis was applied to reduce the dimensions explaining each of the resilience dimensions and to represent by single component score. After the factor analysis, composite scores were developed to each indicator of the child resilience dimension. The first principal component which represented the highest variability of the components were chosen. All the first components representing the resilience indicators showed more than 40% of the variance. In addition, one-way ANOVA and t-test was used to analyze differences of indicators between children under intervention and non-intervention groups, between male and female, and between age groups. In addition, post-hoc test in terms of the box and whisker plot was done using 95% confidence interval to compare groups. For better visualization, diagrammatic representation of the indicators between intervention and non-intervention groups was made.

2.4.1. Ethical considerations

Before data collection, ethical clearance was obtained from the Institutional Review Board of the Institute of Health at Jimma University. Accordingly, all study participants were informed about the purpose of the study and verbal consent was obtained

from children, parents/caregivers and teachers before documenting their response to interview, discussions, and reactions. In the beginning of data collection, it was agreed with intervention groups that written consent was not important mainly due to the absence of sensitive information to be discussed and collected.

2.4.2. Limitation of the study

This study was performed in East Gojjam where communities share similar norms and values. Therefore, the study result may vary if intervention is implemented and evaluated in other parts of the country. Limited resource has restricted us from collecting a higher number of CYRM and MHC data.

3. Results and discussion

3.1. Overall resilience outcomes

Children's resilience and well-being showed substantial improvement among the intervention groups. Using the PIA data, principal component analyses was made to evaluate if children's resilience have been improved after intervention. The statistical analyses indicated that intervention groups showed substantial resilience improvement in most of the resilience indicators, except for *troubling thoughts and feelings* and *problem solving skills*. Statistically significant ($p\text{-value}<0.05$) change of resilience was observed in relation to *home environment*, *school environment* and *social relation* (Fig. 1).

Low performance of *problem solving skill*, and *troubling thoughts and feeling* among the intervention groups could be due to different reasons. One of the main reason might be the shortness of intervention period. Continuous efforts are often needed to bring changes on mind set of school children on problem solving skills and minimize troubling thoughts and feelings [19]. The other reason could be the sensitivity of the assessment tool used to detect each of the resilience indicators. Resilience tools used to assess the changes need to be contextualized to the local socio-cultural conditions [16]. Table 1 shows the t-test values to evaluate the presence of significant changes among resilience indicators before and after child interventions. Except the *troubling thoughts and feelings*, and *problem solving skills*, the other three indicators showed statistically significant difference after intervention. The student t-test comparison pointed out much work is needed to decrease children's *troubling thoughts and feelings* and improve their *problem solving skills* using different approaches, such as gender and age segregated interventions.

However, when the analyses is made with the PIA model in an Excel, there is a slight improvement of those two resilience indicators, though the difference is not statistically significant (Fig. 2). Specifically, the change obtained with the indicator,

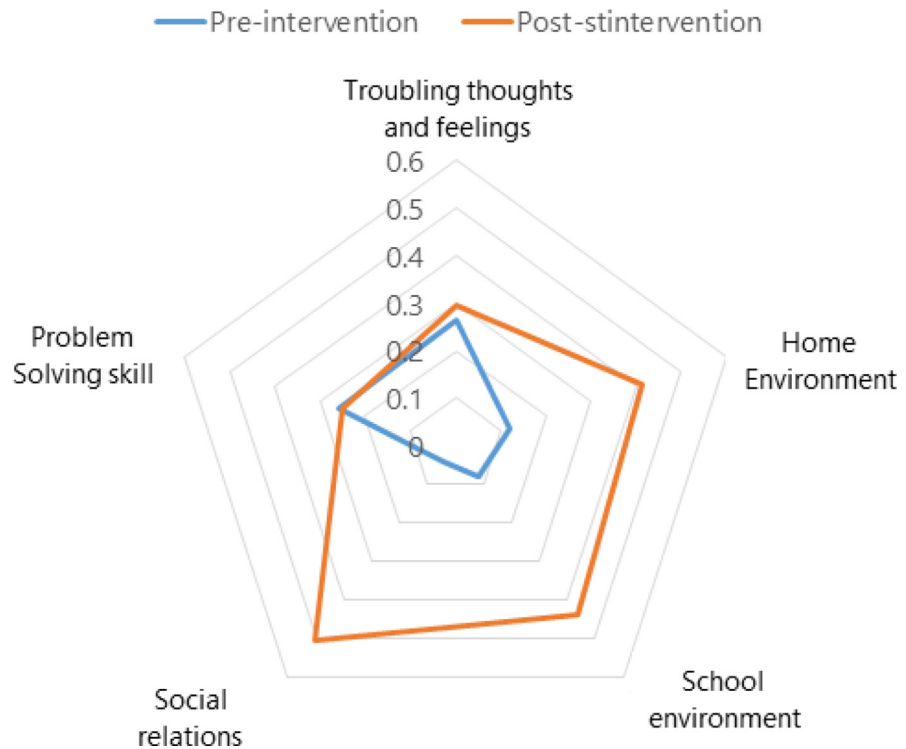


Fig. 1. Average composite score values of the five resilience indicators before and after interventions.

problem solving skills much more visible in the PIA model than ordinated with the component analyses (Fig. 3). The slight difference between the PIA and component analyses could be the nature of data values involved in model construction. PIA uses the full dataset and whereas the component values represent only certain portion of the data (expressed as % variability) which might compromise values of some variables from appearing in model building. This suggests the data collected with questionnaires of PIA need to be analyzed with the Excel PIA model.

Overall improvement of child resilience was observed mainly due to the changes in school, home environment and improvements in social relations. Children and parents FGD discussants have pointed out that children who participated in the

Table 1. Comparison of resilience outcome scores before and after intervention.

Resilience indicators	T	df	Sig. (2-tailed)
Troubling thoughts and feelings	1.151	1765	0.250
Home environment	-8.975	1765	0.000
School environment	-7.250	1765	0.000
Social relations	-9.120	1765	0.000
Problem solving	0.290	1765	0.772

P-value 0.05 is used as the cutoff for significance.

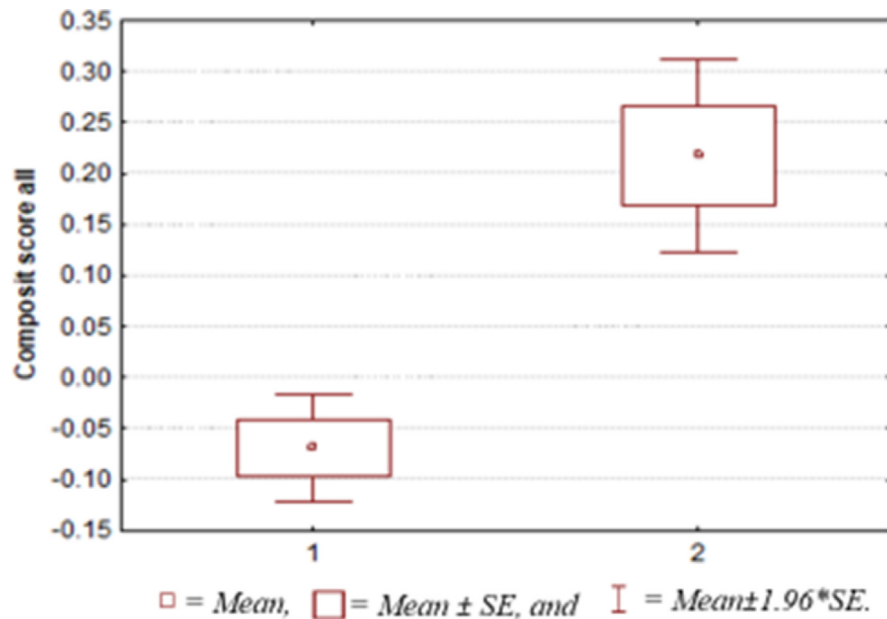


Fig. 2. Box and whisker plot showing difference of the resilience scores before (1) and after (2) the intervention.

intervention program became very active in prevention of child abuse like early marriage, child labour, school dropout, etc. Previous reports also have documented the changes observed among children under intervention. Most discussants mentioned that school children have developed protective behaviors; reporting of child protection concerns to concerned body; have got improved social skills (better communication, friendship, freely talk and discuss with their teachers and family members); become active participant in child-led group and other extra curricula activities; developed social integration skills (especially children with disabilities); and improved school attendance and performance. Records from Europe and somewhere else also indicate improvement of child resilience after similar interventions are made [20, 21].

These findings are in agreement with improvements mentioned by most FGD discussants and KIIs. Children stated that their relationships with their teachers, parents, peers were improved, peer-to-peer relationships were enriched, and fearless self-expression between the village and school community. They were good at keeping friend secrets. The child resilience improvement could, most probably, be due to the active engagement of some teachers into the programme. In all schools, the child resilience workshops were facilitated by teachers. Teachers who facilitated the child resilience interventions were trained on key principles of resiliency and how to exploit the good opportunities that arise in the course of everyday classroom life. School directors and facilitators mentioned that most teachers became participatory and engage students and parents in the teaching process and social affairs. Many studies [22, 23] indicate that parent engagement in the schooling process has a great

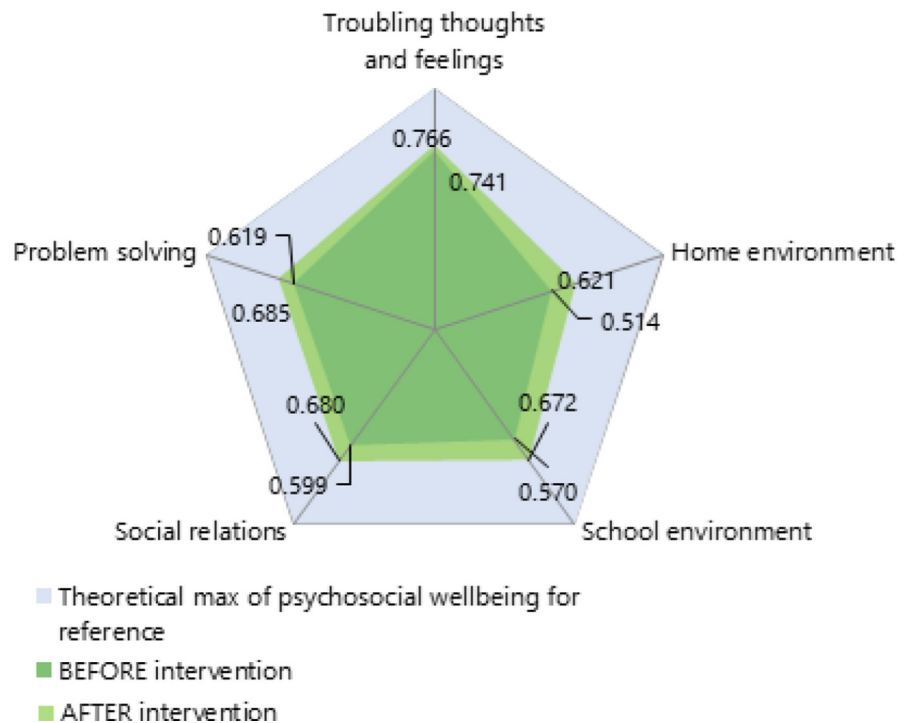


Fig. 3. PIA diagram showing changes on resilience dimensions before and after intervention.

contribution in children's school performance which is an outcome of a resilient child. In addition to parent engagement, our study demonstrated the importance of school teachers' engagement into resilience programmes for the proper implementation of child well-being. In East Gojjam, parents who participated the resilience intervention programme were supportive and often prepared study corners at home, showed love and care, and make a follow-up to their children. On the other side, teachers were discussing about the academic status of children with their parents to identify and solve the different pitfalls that could be solved at parental/care-giver level.

In the overall evaluation, the box and whisker plot with a 95% confidence interval, a significant resilience improvements (p -value <0.001) recorded after intervention programme is launched (Fig. 3).

3.1.1. Changes on school and home environment

Among the resilience indicators, *school environment* was one of the resilience dimension that showed statistically significant improvement. The PIA diagram (Fig. 3) demonstrates a 10.2% resilience improvement after the intervention. Most probably, this improvement of the school environment played the larger role in the resilience build up. Children under intervention were highly motivated to go to school and participate in school activities, engage with their teachers and peers

in different educational activities. After they participated in the resilience training, most children showed empowerment at school, home and their community. This was clearly demonstrated during the friendly meetings of FGD made with them. School children mentioned they had minimized problems that would hamper their educational performance, such as being shy, hesitation to ask questions, and to express themselves at any place whenever they find it necessary.

PIA diagram also demonstrated improvement of *home environment* by 10.7%. Minimized physical and emotional abuse was one of the major improvements discussed by parents. Physical abuse is one of the major punishment still being exercised by most parents in the control area and before the launch of the intervention in most of the communities of the catchment of the school under intervention.

Before the resilience intervention, children were fearful to communicate their teachers, parents and friends; diminished interest in school activities; insulting others; lack of self-esteem and honesty; and poor relationship with peers, etc. A 14 year old boy from grade six explained himself how his feeling and mind-set was.

Before the resilience intervention; I didn't consider myself as a student. I was often a lair, I pretend as if I was going school while I was spending under the tree or climb and stay over the tree until other students are coming back from school. I am doing this because, I neither like to attend schooling nor help my parents at home or outdoor. After I was recruited to participate in the resilience training, I have realized that I could become someone important through schooling. Now I love attending school and to help my parents in their daily activity.

Children has avoided behaviors known to hamper their resilience through a collaborative effort of parents, teachers and the intervention facilitators. Children under intervention were involved in problem solving activities by exploring and negotiating for solutions even on some very sensitive social norms, such as early marriage. They also intervened on student problems, such as school interruption, physical abuse, and insults which were subsequently reflected by school dropouts.

The change of school environment has helped children to have a vision and future hope with regard to attending schools and educational activities. In the non-intervention schools, the school environment was not motivating and enquired the implementation of such intervention programmes to change the attitude of the students and their parents.

One of the major activity that helped children to improve their resilience could be the motivating school environment. In most of the intervention schools, wall paintings of known individuals and motivate school participation, billboards that delivers different messages and discourage wrong practices are very common (Fig. 4), unlike schools with no resilience intervention.



Fig. 4. Motivational paintings, billboards and messages found among school of intervention children. From left to right, (A) indicates graduated student (B) wall painting of Derartu Tulu, a known long distance female runner, (C) students raising their hands in front of their teacher for class participation, and (D) indicates school compound with different billboards where the front one has messages discouraging that conflict among children is not rewarding.

Such encouraging school environment has attracted children to spend their time at schools, unlike that of the pre-intervention periods. During the FGD, children described that before the intervention programme, they did not spend their time at school regularly, where some students were spending under a tree or in a local tea room (even sometimes drinking local strong alcohol call *katikala*), before they realized the importance of schooling in their future life.

On top of that parents at home start to understand that children need an additional support beyond their schooling time. Most likely, such resilience improvement was obtained through the unreserved support of the parents who have participated in the resilience intervention programme. Most parents/caregivers mentioned that enrolling and sending their children to school was assumed sufficient without realizing the need of an additional support from their parents. As the result most children encounter a harsh home environment after school days before the implementation of the intervention. A 13 years old boy explained the harassment he face by his family member was heart breaking.

My mother often did not give me food after I comeback from school. When my father asked her to give me a meal, she often mention that I should eat my schooling (in Amharic it is to mean 'timihirtun yibla') as she feels that the time I spend in school and education is a wastage.

However, after the training, parents became aware of the necessity of moral and materials support to children with close follow up about their day to day activities.

Confidence of children to speak out in front of others, cheerfulness, and active participation to respond to questions were clear indicator of improvement among children under intervention. This has helped children to improve their school performance. After the pre- and post-intervention performance evaluation is made, about 4% of an overall school performance improvement was registered compared to the baseline (Fig. 5). The minimum (2%) performance improvement after intervention is observed in 7–8 grades, whereas the maximum (5%) improvement was at the lowest grade.

In general school environment is among the resilience indicators that showed a significant improvement after the resilience programme is launched (Fig. 6).

This investigation traced that children were often punished by their parents because they went school, as they have less participation in the household and field labour, or they discussed issues equally with the parents. This is a very common practice when the family is led by a stepmother. After the parents meeting and children's workshops, this has been identified as one community gap that parents and caregivers should avoid to punish children by starvation.

Intervening such household practices is a step forward in the resilience build-up [24]. Physical punishment and emotional harassment are known to degrade resilience of children. In addition to the avoidance of different punishments, children need a day to day support for their well-being.

Most children in the intervention groups are enjoying conducive environment created at home and in their village after their parents got the proper understanding

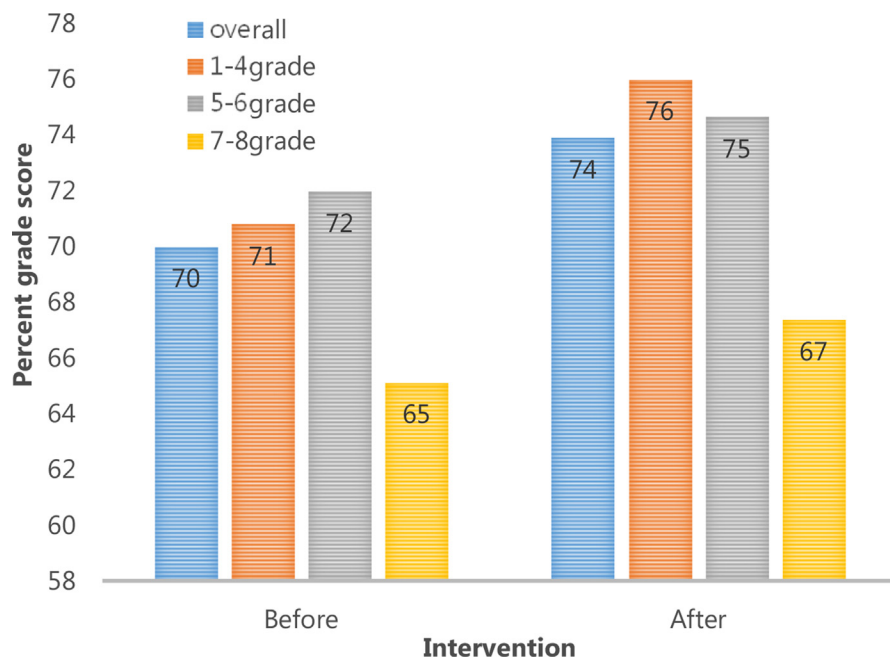


Fig. 5. Average school performance of students before and after resilience intervention.

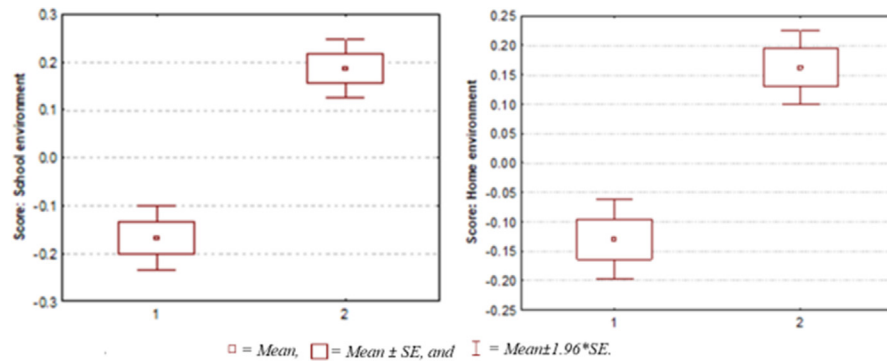


Fig. 6. Box and whisker plot showing improvements of school (left) and home (right) environments before (1) and after (2) resilience intervention programme.

of how their children will become a better person. Some parents have bought solar power source for lighting so that their children can study at night; others provide additional reference books; and some of the parents sit with their children to encourage studying.

3.1.2. Social relations

Resilience improvement in relation to *social relations* among intervention children were 8% compared with the baseline. One of the main areas of social relation improvement observed was the cooperation and integration of boys and girls in school activities. One FGD discussant explained that previously they considered shameful to sit and talk with girls. After the workshop, students were engaged in supporting each other by sharing what they have, helping each other, avoided gossip and became loyal to friends. Most of the participants mentioned that they have at least one friend to support each other. This is one of the resilience dimensions where significant change and improvement was recorded.

Principal component scores before and after intervention indicated the existence of significant resilience improvement (p -value = 0.0001) in terms of *social relations* among East Gojjam Children of resilience.

3.1.3. Problem solving skills

From the survey and FGD, several practices in relation to problem solving skills have been recorded. Some of them have a substantial contribution in protecting severe child abuse in the village. One female child FGD participant explained as follows how she rescued one of her school mate from early marriage.

I learned that one of our school mate were on the process of getting married to the person she don't know and who was much older than her. My father was not aware that educating girls is irrelevant but if married she will not bring

humiliation to the family but respect. I discussed the issue with other fellow students and decided to intervene that the girl should not drop schooling, as we understood this was a bad practice. We informed the school director and also wrote a letter and dropped into the suggestion box explaining the situation. After the school director took the issue to her family, her parents avoided marrying her and now she become one of the clever female students in our school.

However, based on the PIA data, participants showed little improvement than the pre-intervention period, which might be due to the sensitivity of the tool to detect changes on problem solving skills that children have developed. During the FGD, students mentioned some activities that bolster problem *solving skills* such as community mapping, group cooperation, and communicating problems to teachers, parents, and sometimes to government representatives. Parents also mentioned that their children who participated the resilience training were solving family problems such as unifying divorced couples, avoided family quarrel, and reported children abuses.

3.1.4. Troubling thoughts and feelings

After resilience intervention, troubling thoughts and feelings showed the lowest improvement (2.5%) among the five indicators. Though not statistically significant, reduction has been observed on troubling thoughts and feelings. The improvements observed in troubling thoughts and feelings were clearly demonstrated in the qualitative data. Teachers and facilitators mention that students involved in the intervention were happy and interactive. From the quantitative data, we have realized that significant number of participants mentioned that people are not good, there is someone that could hurt them, and people are biased at them. Some feel that parents and teachers are favouring others. This indicated that the intervention was not well suited in solving such problems among the target groups. Such intrusive thoughts could be due to the age of children under intervention. Such intervention are mainly age dependent. Minimized troubling thoughts was expected for children, or people with younger age [25] than adults. Even if all the intervention groups are children, significant improvement of this resilience indicator was not observed.

3.2. CYRM-28 and MHC analyses

Overall resilience score between the control and intervention groups have been made using resilience assessment tool of CYRM-28 and MHC, to measure resilience and well-being respectively. Strong statistical difference ($p\text{-value} < 0.00001$) were observed between the control and intervention groups. Fig. 7 shows the difference between control and intervention group.

In this measurement, the assessment tools used are sensitive enough to discriminate the intervention and resilience group. It is documented that among the non-

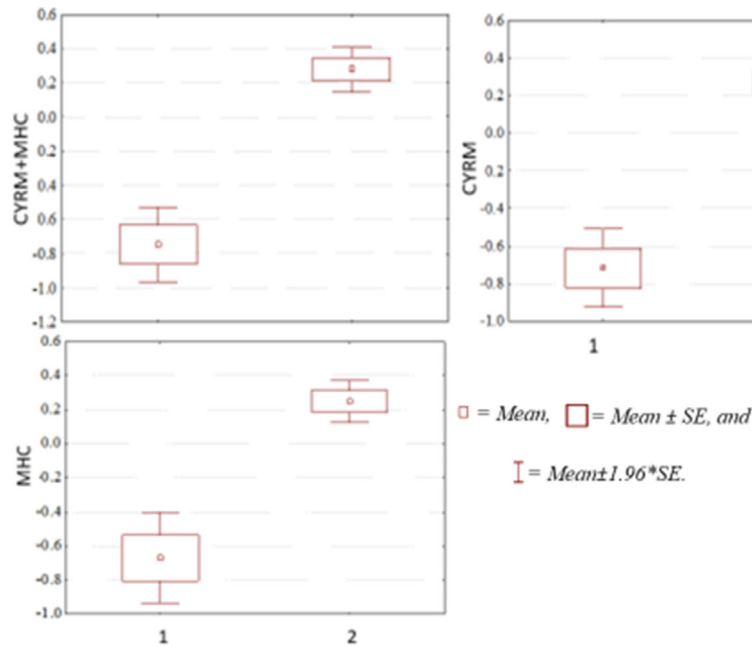


Fig. 7. Box and whisker plot demonstrating the distribution of composite scores CYRM-28 + MHC, CYRM-28 and MHC among the control (1) and intervention (2) groups.

intervention parents, the idea of supporting their children was not observed except within few discussants. These parents were not providing teaching aids, they do not make any follow up on their educational activities, they were overloaded with home and field activities, entertained unacceptable punishment (physical and emotional abuse), girl students got early marriage, parents showed carelessness if their children drop schooling, children do not help their parents, they insult other and frequently quarrel with their friends. The comparative assessment indicated that parents would become supportive families if they got a chance of such intervention programmes [23].

3.3. Age influence on resilience outcomes

The students involved in the resilience intervention were from 10-16. We assumed that 10–12 were much younger than the students and traditionally they would be grade 6 and under; whereas children aged 13 and above to be in grade 7 or more in the normal circumstance (Fig. 8). Using CYRM-28 and MHC data, these two groups were analyzed to check for differences in resilience score and psychosocial well-being. Younger students showed significantly (p -value = 0.032) lower resilience and well-being score than the older ones. However during the FGD it was clear that younger students were active participant, in explaining how the intervention workshop were held, what was liked and disliked.

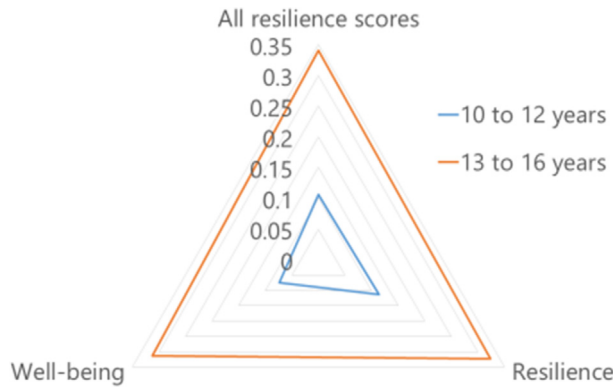


Fig. 8. Effect of age difference on resilience outcome. Student age groups of 13 and above are those who could be in grade 7 and above in the normal circumstance.

The study indicated that special handling of the younger school children could be necessary to have a better resilience outcomes, as resilience and well-being might dependent on age maturity. It has been documented that younger children had diminished resilience compared with older ones [26].

3.3.1. Resilience difference by gender

The PIA data were not recorded by gender and age. As the result the PIA data was not used to compare resilience outcomes by gender and age. However, using the CYRM and MHC data from the control and intervention schools, effect of the intervention between girls and boys was clearly identified.

In the control communities, female students showed more resilience than male students in overall resilience measurement as well as the psychosocial well-being. Whereas, among children under intervention, males showed better resilience than females (Fig. 9). This gives an indication that context specific resilience intervention by gender could be necessary in East Gojjam and similar communities. In the combined (control + intervention) analyses, females had better psychosocial well-being than male students but the reverse is true for child resilience (CYRM-28). On the contrary to our finding, the study done by Susan and colleagues [26] indicated

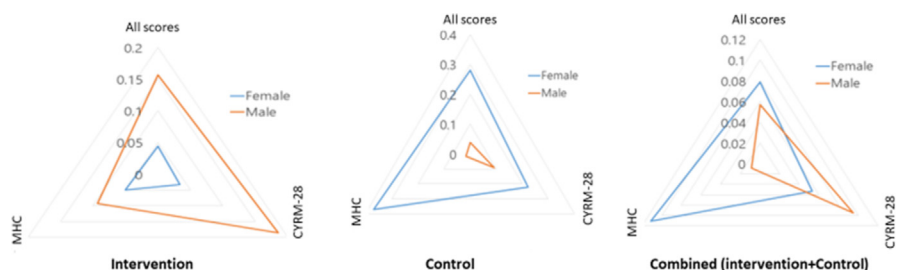


Fig. 9. Resilience measurement outcome among different gender groups of the control, intervention and all categories using CYRM-28 and MHC assessment tools.

that females are more resilient than male children. Other studies suggest that gender basically has effect on resilience as the gender right is highly dependent on socio-cultural factors, and religious ideologies [27, 28].

The resilience shift identified in our study may be either child resilience interventions were male centric or females might not be properly capturing the main messages of the intervention activities. This may suggest that provision of female centred resilience intervention could bring a better outcome to girls.

4. Conclusion

The study revealed that resilience interventions have brought substantial change in the improvement of psychosocial well-being and demonstrated how the intervention made a great difference on the lives of children in rural poor community. Improvements made in school and home environment made children more resilience and created hope in their future lives. In addition their social relations to peers, their parents and teachers was also another source of resilience build up. PIA resilience measurement tool was not sensitive enough to trace changes in *problem solving skills* of children under intervention. However, the qualitative data obtained from children and parents indicate strong improvement of problem solving skill. The intervention didn't bring change with regard to *troubling thoughts and feelings* as confirmed by PIA and qualitative data. CYRm-28 and MHC tools were sensitive enough to detect the resilience changes. Among the control group, girls showed relatively better resilience than boys. However after intervention, boys become more resilience than girls which seems a shift of resilience among gender groups. On top of that younger children were found to be less resilient than the older ones. In such interventions, gender and age segregated intervention is strongly recommended to bring the intended change.

Declarations

Author contribution statement

Argaw Ambelu: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

Tamirat Mulu: Conceived and designed the experiments; Performed the experiments; Wrote the paper.

Amare Seyoum: Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Lijalem Ayalew, Sarah Hildrew: Contributed reagents, materials, analysis tools or data.

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Competing interest statement

The authors declare no conflict of interest.

Additional information

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