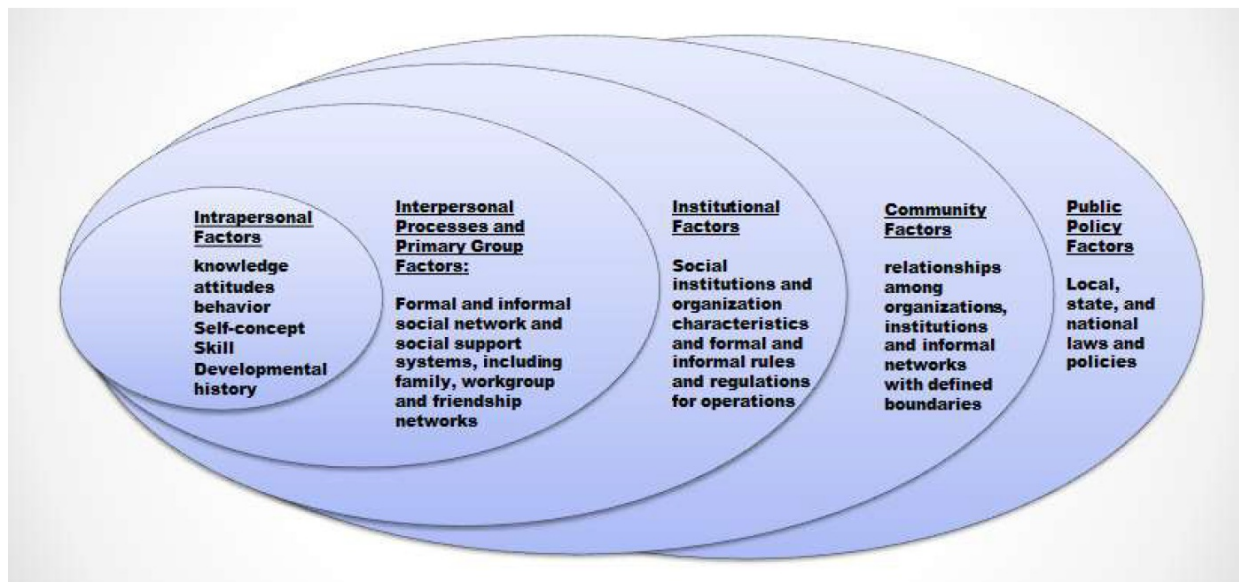# Supplementary 1

Social-Ecological Model

The use of social-ecological approaches to current mental health care is important because past efforts have focused on the individual or family but not on environmental influences [11]. McLeroy, (1993), an early conceptualist of social ecology, asserted that an ecological approach to behavior explores the relationships among the social causes of health behaviors across multiple levels [12]. In a social ecological model, behavior is viewed as being determined by intrapersonal, interpersonal, institutional, community or organizational, and public policy or social factors (Figure 1) [9,13] .

Figure 1: Social Ecological Model [9].

References

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Supplementary 2

Rigor

By following the recommended steps of the Photovoice and CBPR process it is hoped that findings will contribute to the validity of the research method and approach. It is important to document efforts toward demonstrating validity in Photovoice studies. Validation of findings that result from Photovoice studies helps identify viable interventions [23]. Qualitative researchers should clearly articulate the steps and rationales for decision making during the research process to demonstrate rigor [64]. Accordingly, this author made an effort to clearly describe the Photovoice and CBPR study processes and provided rationales for decision-making. Trustworthiness of a naturalistic inquiry such as this study can be substantiated by meeting the classic qualitative research criteria of credibility, transferability, dependability, and confirmability established by Lincoln and Guba (1985)[65]. Credibility refers to establishing confidence in the findings of a research study. Activities to increase the probability that credible findings will be produced include prolonged engagement, persistent observation, and triangulation of sources [65]. The approach for this study was CBPR and prolonged engagement with the study population is inherent in the CBPR process. The primary investigator resided in the study area for four decades which resulted in insider knowledge of the culture of the area. The PI was also a health care provider in the community for three decades, which contributed to trust building within the communities of study. Persistent observation identifies salient elements of a situation that are most relevant to the issue being examined [65]. Photovoice encourages iterative examination of data in search of the most salient thematic elements. Triangulation can be accomplished for the naturalistic inquirer through multiple sources, methods, and investigators. In this study, triangulation of sources was met through interviewing multiple participants individually. Triangulation through multiple methods was met by iterative analysis of data in the form of individual interview transcripts and surveys, photo images, and audio-recordings. Referential adequacy is a technique for demonstrating credibility through archiving and recall of data. This criteria was met by archiving of photo-images and digital audio transcripts for reference. Member checking is considered a crucial technique for establishing credibility related to constructions resulting from data [65]. Unfortunately, member checking became a serious limitation to this study. Group meetings were scheduled with participants to discuss photographic images to meet consensus on thematic content. However, a last-minute cancellation of mental health provider attendance and report of increased depression by a participant caused the primary investigator to cancel all further group sessions in the best interest of the participants. In future studies, member checking and credibility will be improved by adding two more rounds of individual interviews to discuss not only their own photographs, but to view peer images, and gain collective consensus of thematic content. This will triple the amount of interview data collection, cost of transcription, and time for iterative analysis. Participants reviewed a first draft of this manuscript and returned the copy with their comments to the PI which could be considered a form of member checking. Most of the comments received from the adolescent participants were praiseworthy in nature such as "Good job".

Transferability corresponds to generalizability. The PI provided a thick description of the research process so that the reader can apply findings contextually. Dependability is the reliability criterion, and an audit trail can demonstrate such. An audit trail consisting of detailed delineation of the research process that included how research data was acquired and analyzed, researcher reflexive notes, and Computer Assisted

Qualitative Data Analysis Software files is available for future auditing should the need arise. Confirmability refers to how findings of a study are the result of a dependable inquiry process. Use of an audit trail, triangulation, and reflexive journal can generate confirmability [65]. The PI kept a reflexive journal during the research process and memo notes have been saved within the analytic software program. Thus, an audit trail has been kept should an inquiry audit be required. Additional efforts were taken to demonstrate validity. Morse et al. (2002) recommend establishing validity through coherence to the strategies of investigator responsiveness, methodological coherence, theoretical sampling, sampling adequacy, active analytic stance, and saturation [66]. These strategies ensure reliability and validity by causing the researcher to correct the direction of the analysis and the development of the study as it progresses instead of waiting until the end of the study. Investigator responsiveness was demonstrated by monitoring and adapting the Photovoice method to needs of the sample population as the study progressed and simultaneously considering how these adaptations would affect study outcomes. Methodological coherence means the question matches the method, which matches the data and analysis. The PI was sensitive to the relationship of study aims, research process and findings. The approach, research design and method were critically appraised and chosen as most appropriate for addressing study aims. Sampling must be appropriate, consisting of participants who have the best knowledge of the research topic. This ensures that optimal quality data is collected. Participants were recruited based on their expected knowledge of living with depression. An active analytic stance is demonstrated by collecting and analyzing data at the same time, which is the essence of attaining reliability and validity [66]. Comparing new data to data that has already been collected confirms theory [66]. The PI concurrently compared new interview data to previously collected interview data as the study progressed. Photovoice demonstrates saturation by encouraging an iterative comparative analysis of interview data and seeks thematic consensus among participants. Interview data was reviewed and analyzed three times by the PI to gain saturation of identified thematic content. Photovoice purposes to gain iterative thematic analysis through participant consensus also. Morse et al. (2002) argue "that these strategies force the researcher to correct the direction of the analysis and the development of the study as it progresses instead of waiting until the end of the study, thus ensuring reliability and validity of the completed project"[66, p.9] Qualitative validity was demonstrated in this study through accepted criteria. Future replications will continue to contribute to the rigor of the CBPR and Photovoice process with youth participants.

References

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[65] Lincoln Y, Guba E (1985) Naturalistic Inquiry. SAGE: Beverly Hills.

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Supplementary 3

Examples of Photographs Categorized by Social Ecological Level and Theme

Intrapersonal Ecological Level

Activity

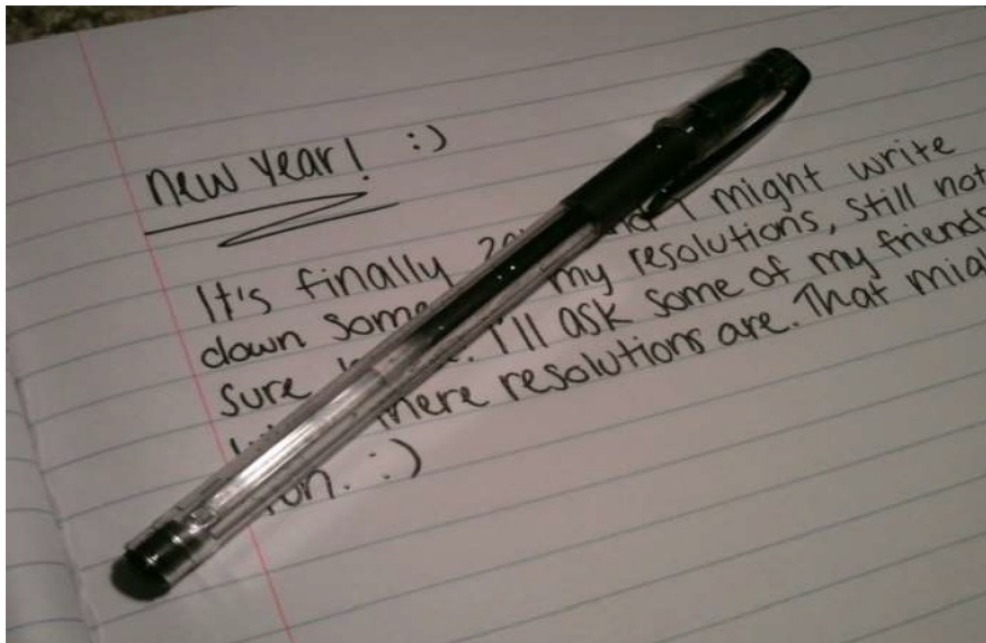"…the iPad® and technology bring you comfort and provides escape." (female, age 16)

"I just wanted to escape…I put the shoes walking away and like escaping for a while." (female, age 17)

Activity

"…it makes some people feel more depressed and lonely whenever they're sitting in the rain by themselves…" (female, age 15)

Creativity

"Many of them (teens with depression) believe that instead of doing things that cause more problems like drugs or alcohol, write instead of trying to hurt themselves by cutting or thinking of suicide ...".
(female, age 14)

Creativity

"I really love to do art and art is something that I usually mostly do when I'm not feeling well, in depression mostly, and it does help me to get out of it." (female, age 14)

Spirituality

"One of the eggs is fertilized and I thought of it as new life being born. New life brings happiness." (female, age 15)

Interpersonal Ecological Level

Security

"…people need to be more aware that it's (cutting) not something teens just do for attention…Its something they have a problem with that they can't deal with and that's the only thing they know." (female, age 17)

Security

"I think we should help people be their true selves. People get depressed because they don't truly see who they want to be." (female, age 14)

Security

"Without my friends, I couldn't really do much… I would be trapped here all the time and sad."
(female, age 15)

Responsibility

Chores are not depressing because every time I go in there to feed the birds, they go crazy. Morning and afternoon feedings are kind of humorous because you see chickens trying to chase out the other chickens. Also with animals you learn responsibility." (male, age 15)

Morbidity and Mortality

"I didn't know them but it's still depressing to know that someone lost someone and you knew they were experiencing sadness." (female, age 15)

Community Ecological Level

Activity

"I see the cross of a church and it is light." (male, age 11)

Supplementary 4

Participants were encouraged not to attend the Open House due to confidentiality concerns. The exhibit was open for one month at the local arts center and then transported to public libraries in the other two participating counties. The exhibit remained on public display at each library for one month consecutively. Exhibits were not held at county schools due to confidentiality concerns. Flyers summarizing the study and a comment book for the public were provided at each exhibit. Examples of comments in the book included: "touching", "inspiring", "reminds me of the intelligence within a child if you give them the chance to speak", "thanks for shedding light on a topic in the community that needs more attention", "enlightening", "I can relate to so many of these from my past", "thanks for using art in medicine", " I ♥ U!!!", "I'm glad they found an escape through the lens", "I am unable to see the beauty in some of these photos", "I want to return and spend more time viewing this in depth", "feel sympathetic to the artists", "teens can be reclusive. I like that these teens took on a project that allowed us in to their perspective, feelings and thoughts. I appreciate their openness and honesty and enjoyed viewing their art", "original", "I would buy one", and "beautiful artwork!". It is important to note that displaying photographs in an art gallery pre-conceives them to be works of art by the viewer, whereas they may not be perceived as such elsewhere.