The Impact of Surf Therapy on Risk-Taking and Interpersonal Closeness Among Violence-Exposed Youth

Keywords: Surf-therapy, mental health, risk-taking, psycho-social, violence, South Africa

Abstract

Objective:
The impacts of the sport-based, psycho-social intervention, surf therapy, have thus far yielded promising results based on self-reported and qualitative assessments. The purpose of this study is to use a multi-method evaluation to investigate the effects of Waves for Change's surf therapy program for at-risk youth according to the primary intervention aims.

Method:
Two-hundred thirty-three violence-exposed youth from South Africa participated in a multi-method program evaluation of Waves for Change's surf therapy program. Participants who were either enrolled in surf therapy or in the waitlist comparison group completed self-report assessments of perceived stress, sensation-seeking, and interpersonal closeness, as well as behavioral measures of risk-taking and self-esteem. Data was collected at two time points, six months apart.

Findings:
Participation in surf therapy among participants, each of whom endorsed exposure to violence, led to significant reductions in risk-taking behaviors and sensation seeking. Data also suggests that Waves for Change's surf-therapy increased participants' sense of interpersonal closeness. There were no significant changes observed in participant stress or self-esteem, which were both assessed with measures that yielded low internal consistency.

Conclusion:
Findings suggest that Waves for Change's surf-therapy program is an efficacious, trauma-informed intervention for violence-exposed youth. The intervention has been found to strengthen interpersonal connectivity and reduce impulsivity.

The Impact of Surf Therapy on Risk-Taking and Interpersonal Closeness Among Violence-Exposed Youth

Even if you have never surfed, you likey know that riding a wave takes bravery, perseverance, focus, and an optimistic outlook. Such skills are beneficial in many sports and translate to the rest of life. Physical activity is consistently found to benefit physical, psychological, and social health (e.g. Biddle & Mutrie 2008; Reed & Buck, 2009). One such sport-based intervention is surf therapy. Surf therapy is defined by the International Surf Therapy Organization (2019) as an intervention that combines surf instruction and activities that promote psychological, physical, and psychosocial wellness, conducted individually or as a group. In addition to surf instruction, programs often incorporate mentoring, social skills development, psycho-education, and group discussion, fostered in a safe interpersonal environment. Surf therapy is well situated to deliver these intervention elements in part because participants can practice learned coping skills in response to in-the-moment physiological and emotional stressors (e.g. a wipe out) and in order to stay safe while on the beach and in the ocean, a culture of caring for one another and speaking up for oneself is cultivated (Marshall et al., 2020).

In a recent review of the academic literature on surf therapy, Benninger and colleagues (2020) found consistent evidence that surf therapy increases self-concept, emotional regulation and social competency skills, engagement with school, and reductions in behavioral problems among youth in need of social and emotional support (Hignett et al., 2018, Colpus & Taylor, 2014; Matos et al., 2017). Through surf therapy, participants also have the opportunity to be outside. Evidence demonstrates the psychological benefits of combining physical activity and being in natural environments (e.g. Coon et al., 2011; Mitchell, 2013, Eigenschenk et al., 2019),

which builds on knowledge that being in nature nurtures well-being (e.g. Hansen-Ketchum & Halpenny, 2010; Cervinka et al., 2011).

One such context where surf therapy is provided is South Africa, which at present, is faced with social, health, and economic inequity, with over half of South Africa's children living in conditions of poverty (Unicef, 2020). Widespread poverty and unemployment are two social factors that support violence (Seedat et al., 2009) and despite widespread exposure to adverse social and environmental influences, government-wide programs and psycho-social are limited (Van der Merwe & Yarrow, 2020). Instead, non-governmental organizations have been the primary leaders in developing psycho-social programming to safeguard against violence and support those who have been victimized (Seedat et al., 2009).

A non-governmental organization that provides much needed services in the form of surf therapy to youth is Waves for Change (W4C). W4C's surf therapy combines surfing, mentorship, psycho-education, and social support to strengthen emotion-regulation, self-esteem and efficacy, as well as to foster a positive outlook on the future among at-risk child and adolescent participants.

Existing research on W4C suggests that participants perceive the program to be a trauma-informed physical activity. Darroch and colleagues (2020) define trauma-informed physical activity as an appealing and accessible program that includes: safety; collaborative and clear communication; caring instructors trained in trauma-informed care; and emotion-awareness and regulation exercises (Marshall et al., 2020; van der Merwe & Yarrow, 2020). South African participants reported W4C to be a safe space where youth can establish social connections and support through psycho-education about coping and pro-social communication and participation in a fun activity collectively (Marshall et al., 2020). According to regular internal evaluations,

W4C surf therapy has been associated with positive self-image and self-regulation among participants. Furthermore, a qualitative study from W4C's program in Liberia revealed that surf therapy produced a supportive, familial environment of physical and emotional safety, fostered new positive social connections, and cultivated coping skills (Marshall et al., 2020). A randomized controlled trial, conducted as part of a master's project (Snelling, 2016) on the impact of W4C's surf therapy, found no statistically significant changes in self-reported psycho-social well-being.

Qualitative work has demonstrated that surf therapy benefits participants' interpersonal and coping skills through a positive and safe environment but quantitative self-report measures thus far have not yielded statistically significant change, raising the question of how to measure and interpret change throughout surf therapy. Accordingly W4C commissioned an external program evaluation, which triangulated self-report measures and objective behavioral measures that were matched to their intended program outcomes.

To develop the evaluation, W4C's program aims were considered. The intervention intends to combat social exclusion by helping young people from violent communities develop a skill set necessary to better regulate their emotions, identify and maintain positive life choices, and create meaningful relationships. To effectively demonstrate the impact of surf therapy, a trauma-informed sports program, among violence-exposed youth, self-report assessments had to be supplemented with behavioral measures. Implementing self-report measures for child participants, although time and cost efficient, has significant limitations, that include inconsistent reports of well-being due to developing abstract thinking and memory recall (Going et al., 1999) and frequent underreporting of "bad" behaviors (e.g. risk taking) and feelings (e.g. stress) and overreporting of "good" behaviors (e.g. exercise) and emotions (e.g. happiness) to please adults

(Anne-Linda Camerini, 2017). As such, the evaluation incorporated behavioral and self-report measures based on program aims and qualitatively observed improvements in self-esteem, social cohesion, and risk taking to examine youth participants' self-regulation and risk-taking, and perceptions of social relationships.

The present study builds off of existing surf-therapy research, including the baseline findings of the present evaluation (Beranbaum et al., 2022), by assessing the impacts of surf-therapy using a multi-method evaluation that incorporates self-report and behavioral measures. Exposure to violence, sensation seeking, stress, self-esteem, interpersonal closeness, and risk taking tendencies were examined over the course of W4C's surf-therapy program among child participants who speak different languages and come from various subcultures within Cape Town, South Africa. The present evaluation aims to assess the impact of W4C surf therapy using a multi-method assessment and methodologically investigate the benefits and drawbacks of various assessment approaches for youth psychosocial programming. A secondary aim of the present study was to determine the feasibility and utility of behavioral and self-reported measures administered in a naturalistic setting.

Method

Program Characteristics

The present study evaluated the surf-therapy intervention conducted by W4C, which is designed to provide violence and trauma-exposed children and adolescents with social support and skills to strengthen their emotion regulation and positive self-esteem. Through engagement with surfing paired with psychosocial-education and a coping skills curriculum skills training regarding emotion recognition, under the umbrella of a supportive social environment, children build confidence, strengthen their self-regulation, and develop hopeful views of the future. The

10 month long curriculum is distributed as mentor facilitated weekly sessions held at local beaches. W4C picks up children from their township communities by bus and drives them to the beach where they receive a nutritious meal, participate in surfing, psycho-education, and community building activities, and then are brought back home.

Study Design

A multi-method program evaluation was conducted between 2018 and 2019 that included a comparison group of children who were on the W4C waitlist. Participants' exposure to surf therapy varied widely; some participants had not yet begun surf therapy whereas others had already participated in 33 weeks of the surf therapy curriculum. All intervention and comparison participants were assessed at two time points (i.e. "baseline" and "endline"), 6 months apart. Data collection occurred in participants' schools or in W4C facilities.

Participant recruitment and characteristics

South African youth (N = 233, 57.5% female), aged 9-17 years old (M = 11.26) from Masiphumelele, Khayelitsha, Lavender Hill, Hangberg, and _ townships[1]. Participants were referred to W4C by school personnel based on perceived vulnerability to anxiety, depression, attention deficits, and aggression, as well as known exposure to traumatic events or loss. Referred participants met age criteria, were interested in joining surf therapy, were available during times of data collection, and parents assented to research and surf therapy participation.

Measures:

Self-report measures and behavioral task instructions were translated and back-translated into Xhosa and Afrikaans from English by multi-lingual W4C staff.

[1] South African townships are communities developed to identify 'non-White' neighborhoods during apartheid. They were established in the peripheries of cities as part of the segregationist doctrine that aimed to minimize interactions between people of different skin colors (Jürgens et al., 2013)

Trauma and Stress.

Violence Exposure. Exposure to violence was evaluated with the 25-item *Community Experiences Questionnaire* (CEQ; Schwartz & Proctor, 2000). Participants rated on a scale from 1 (never) to 4 (lots of times) how often they had witnessed or directly experienced violence. The CEQ has subscales that assess exposure to violence through witnessing and direct victimization.

Stress. The *Perceived Stress Scale for Children* (PSS; White, 2014) was administered to assess self reported stress during the past week on a scale of 0 (never) to 3 (a lot). Items are summed with the highest possible score being 39. The scale had poor consistency determined by Cronbach's alpha of .58.

Self-Concept.

Self-Esteem. Self-esteem was measured with a seven-block *Implicit Association Test* (IAT; Greenwald et al., 1998). Participants were asked to categorize attributes associated with pleasant or unpleasant and attributes belonging to the categories of Self or Other for the Self-Esteem IAT (Greenwald et al., 2002). Faster performance is expected when highly associated concepts and attributes share the same response computer key. Due to child-level literacy and limited familiarity with a computer keyboard, certain elements of the task were modified: 1) Positive or negative emojis, or simple pictures, replaced positive and negative attribute words; 2) Color-coded stickers were placed on the two keyboard keys participants were instructed to press to minimize reaction time, unrelated to the measured construct. The outcome variable is the IAT summary 'D' score, which includes practice and test trials. Positive values are indicative of positive associations with the self and negative values indicate negative associations with the self.

Interpersonal Closeness. The *Inclusion of Other in the Self* (IOS; Aron et al., 1992) questionnaire was administered to assess participants' closeness with others. See appendix A for scale imagery. Participants selected the picture that best depicts their relationship from a series of circular diagrams that represent degrees of overlap between two circles. Several items were modified to address perception of closeness with: "The people in your surf group," "Your surf coach," "Friends who are boys (or girls)," and "A person with the same (or different) skin color as you." The scale measured closeness and connection at an individual item level to examine specific changes in relationships and had acceptable internal consistency of .74.

Risk- and Sensation-Seeking.

Risk Taking. Risk-taking propensity was assessed with the *Balloon Analogue Risk Task for Youth* (BART-Y; Lejuez et al., 2007)). Participants were asked to inflate a computer-generated balloon to earn an unspecified prize. With each pump of the balloon, participants earn a point and can choose to stop pumping the balloon and transfer the points to a permanent prize meter. If the balloon explodes when it is pumped, all of the points for that balloon are lost. There is a set number of balloons, and participants are presented with a new balloon after a prize transfer or balloon explosion. Based on prior research demonstrating nearly identical results using the first 10 balloons compared to 30 balloons (Lejuez et al., 2003), the present student set the number of balloons at 15 due to time constraints of collecting data in a naturalistic environment. For each non-popped balloon, the number of pumps is recorded and averaged into the typical outcome variable, adjusted average pump count. Larger values are suggestive of higher risk-taking.

Sensation Seeking. The *Brief Sensation Seeking Scale for Children* (BSSS-C; Jensen et al., 2011) was used to measure propensity toward risk taking and sensation seeking behaviors.

Two sensation seeking items were eliminated due to lack of relevance and replaced by the items: "I would like to surf big waves even if there are sharks" and "I would like to surf at night." Items on the scale are averaged with the highest possible score being 4. Cronbach's alpha was acceptable (.68), though was significantly lower than the internal validity (a = .82) found in Jensen and colleagues' (2011) development paper.

Procedure

Psychologists at The New School for Social Research with expertise in program evaluation were recruited to design and conduct a program evaluation for Waves for Change in order to understand the target population needs and program effects (Beranbaum et al., 2022). As the program evaluation aimed to use a data-driven assessment to examine W4C's surf therapy to inform and improve upon its practices, IRB approval was not required. The New School's IRB approval affirmed this understanding at the outset of the project. After data was analyzed and appeared to be of larger interest, The New School's IRB was consulted who determined that use of the present data for publication were exempt from IRB approval as they were de-identified, archival program evaluation data.

Parents or guardians of child participants provided consent to participate in assessment and evaluation as part of the consent to participate in surf-therapy. Participants verbally assented in English, Xhosa, or Afrikaans to participate in the evaluation at the start of the evaluation session. As part of the consent, youth participants were informed that they could discontinue the assessment at any time and that all information would be kept private, including from parents and teachers.

Participants completed data collection at two timepoints: at the start of the W4C surf therapy curriculum and after six months at the end of the curriculum. In groups of eight to ten,

physically spaced to ensure privacy, participants completed the self-report. Data was collected by W4C staff and Peer Youth Researchers who were W4C mentors who had exhibited strong interpersonal skills and interest in research. Peer Youth Researchers were trained in the theoretical concepts being assessed (e.g. risk, social closeness), task administration, and data organization, de-identification, and security. These research assistants read questions aloud in English, Xhosa, and or Afrikaans depending on participants' preferred language and participants answered questionnaires on paper surveys. After the self-report questionnaires, participants, facilitated by a research assistant, completed the behavioral tasks on Windows 8 tablets using the Inquisit Lab 5 software.

Physiological data was collected but there was not enough data of interpretable quality to observe physiological change.

Analysis Plan

It was envisaged that data would be collected from participants from various neighborhoods in the W4C program, at three time points (baseline, mid- and post-surf therapy) and from a comparison group, at two time points. Data collection time points were planned to be at least two months apart. Various factors, however, created challenges for the data collection team to collect data at the exact times and intervals envisaged. As such, baseline data for some participants would have been before the participants came to their first surf therapy session, while baseline data for other participants (collected during the same data collection drive) would have been after they have been for four surf therapy sessions already. While the W4C program builds up slowly during the first month of the program, technically the baseline data for some participants could not be considered 'true baseline' data. Similarly, time point two data for some

participants would have been at a significantly different time than time point two data for participants in the same cohort.

To account for the complicated ecological circumstances of data collection, the evaluation's analyses required a somewhat atypical approach. IBM SPSS Statistics Version 24 was used for all statistical analyses. Independent and paired-samples t-tests were used to examine differences in self-report and behavioral data collected at baseline and endline between participants who were new to surf therapy and participants who had already been enrolled in surf therapy for at least seven week. Seven weeks was determined based on the W4C curriculum and the participant sample size. Repeated measures ANOVAs were conducted to examine change in self-report and behavioral data from the first and second data collection periods. Participant interactions between W4C participants and comparison were also assessed.

Results

Trauma and Stress.

Trauma. Participants endorsed high rates of exposure to violence, such that 100% of participants had witnessed violence and all but two participants (98.2%) had directly experienced violence. For endorsed direct violence experiences see Table 1 and for witnessed abuse experiences see Table 2.

Stress. Examining self-report data collected at baseline reveal that length of time in surf-therapy and perceived stress were not significantly correlated, $r(93) = .03$, $p = .760$. Repeated measures ANOVA with a between subjects contrast did not yield a significant within-subjects effect for stress from baseline to endline data collection, $F(105) = .18$, $p = .676$, such that there was no significant difference in reported stress depending on the time of data

collection. No significant between-subjects interaction was found, F (105) = .001, p = .977, such that W4C and comparison participants did not differ in their experience of stress.

Self-Concept.

Self-Esteem. To assess self-esteem, participants were administered the self-esteem IAT, which yielded inconclusive data due to high inaccuracy rates (i.e. 58% of participants pressed the incorrect key at least 75% of the time). Qualitatively, on-the-ground W4C staff reported that participants had difficulty understanding the task, a report that is consistent with the IAT data produced. Data from the self-esteem IAT ought to be considered inconclusive.

Independent t-tests reveal there was no significant difference in self-esteem among W4C participants who were new to surf therapy and those who had participated in at least seven weeks of programming according to the IAT summary 'D' score, t(147) = .88, p = .384. Participant gender did not predict IAT responses, r(149) = -.035, p = .669, nor IAT change from baseline to endline data collection, r(67) = -.07, p = .558. Repeated measures ANOVA also yielded no significant within-subjects interaction, F (102) = .20, p = .656, nor between-subjects interaction, F (102) = .008 p = .930, such that that there was no change in self-esteem from baseline to endline data collection periods and there were no differences in W4C and comparison participants' self-esteem.

Interpersonal Closeness. A paired-samples T-test reveals that participants feel significantly closer with people in their lives at endline compared to baseline, t(94) = -6.20, p < .001. To assess for gender-based differences in perceived interpersonal closeness, including connectedness with female and male friends, the IOS was analyzed according to participant gender. Female participants reported feeling significantly closer to a friend, t(54) = -3.46, p = .040 and to her closest family member, t(54) = -.35, p = .001. Male participants reported feeling

significantly closer with people who hold similar identities, namely with friends who are boys, $t(36) = 2.08$, $p <= .045$, and people who are from the same racial background, $t(32) = 2.46$, $p = .019$.

Risk- and Sensation-Seeking.

Risk-Taking. An independent t-test examining differences in BART-Y scores between participants at baseline collection who had just begun surf-therapy and participants who had been enrolled for at least seven weeks demonstrates significant differences in risk-taking. Participants who had experienced at least seven weeks in the program exhibited significantly lower risk-taking behavior ($M = 18.31$, $SD = 10.09$) than participants who were new to the program ($M = 24.38$, $SD = 11.39$) $t(84) = -3.14$, $p = .002$. Both new participants and those who had participated in at least seven weeks of surf therapy exhibited significantly lower BART-Y scores compared to American participants of a similar age who, unlike the present evaluation, were not recruited based on violence exposure or other risk factors. Collado and colleagues (2017) documented adjusted average pump count in the first ten balloons to be 35.2 ($SD = 17.4$) among Black youth and 34.4 ($SD = 12.3$) among White American youth.

Participants' performance on the BART-Y differed according to participant gender over the course of surf therapy, such that scores were negatively correlated with length of time in surf-therapy among female W4C participants, $r(86) = -.22$, $p = .039$, whereas male participants' BART-Y scores were not significantly correlated with length of time in surf-therapy, $r(60) = -.04$, $p = .755$.

Due to the small sample size of W4C participants who completed the BART-Y at both timepoints (n = 57), repeated measures ANOVA was not separated by participant gender. The repeated measures ANOVA among W4C and comparison participants reveals no significant

within-subjects interaction, F (91) = 1.10, p = .298 or between-subjects interaction, F (91) = .15, p = .703, indicating that there were no significant changes in BART-Y scores between baseline and endline data collection and W4C participant data did not differ significantly from comparison participants.

Sensation Seeking. A repeated measures ANOVA with a between subjects contrast yielded a significant within-subjects effect for sensation seeking from baseline to endline data collection, F (135) = 5.15 p = .025, such that there was a significant reduction in reported sensation seeking at endline compared to baseline. There was not a significant between-subjects effect, F (135) = .003 p = .960, meaning that comparison and W4C participants did not differ in their sensation seeking. Among W4C participants assessed at the initial data collection period, there were no significant differences in sensation seeking according to length of time in surf therapy, t(162) = -.19, p = .849.

An item analysis assessed how different types of sensation seeking could be either adaptive or maladaptive. Impulsivity and seeking dangerous experiences may be understood as maladaptive whereas bravery to try new or challenging activities could be adaptive. A paired-samples T-test from baseline to endline data collection reveals that male participants reported significantly less interest in high risk activities, such as wanting to "surf at night," t(37) = 2.37, p = .023. By contrast, male participants also exhibited increased confidence as assessed by the item, "I'm the first one of my friends to try new things," t(38) = -2.41, p = .022. Both male and female participants reported less interest in risky relationships with friends who "break the rules," t(91) = 4.25, p < .001. Participants' interest in relationships with others who "do what they want" and "break the rules" is related to participants' sense of closeness with others. At baseline preference towards friends who break the rules was negatively correlated with

participants' sense of closeness with "a friend" on the IOS, $r(159) = -.21$, $p = .007$, and closeness with "a family member," $r(157) = -.26$, $p = .001$.

Discussion

Results from the present program evaluation indicate that W4C's surf-therapy program is an effective, sport-based intervention for trauma-exposed children and adolescents with specific impacts on risk and interpersonal connection. W4C's careful balance of psycho-education, social support, and emotion regulation skill-building within the outdoor context of surfing strengthens participants' interpersonal closeness and cohesion as well as reduces participants' risk-taking tendencies while encouraging self-confidence and bravery.

There were clear connections between W4C's intended goals, outcomes described in qualitative work, and some key findings of the present evaluation. The program aims to foster supportive relationships, which has been corroborated with qualitative data. One way interpersonal skills and relationships are fostered by W4C is through mentors encouraging participants to check in with their peers to gauge one another's sense of safety and to provide support to their friends while in and out of the water. This process is aligned with approaches identified by Gambone and Arbreton (1997) that enhance resilience among participants of sport-based programs. Elements include receiving social support from adults, opportunities that enable young people to develop a sense of safety, and settings that help youth develop a sense of belonging. W4C's purposeful process that builds social support as a way to help foster participants' bravery to go in the water and that cultivates emotional awareness and regulation is reflected in the program evaluation data. Participation in surf therapy is related to increased perceived closeness in meaningful relationships (i.e. friends and family) and decreased interest in

relationships with people who do not support the cohesion of the group (i.e. friends who do what they want and break the rules).

As well as attending to participants' supportive relationships and safety, W4C's surf therapy aims to strengthen participants' emotion regulation capabilities and positive life choices through group based exercises. Qualitative data had previously indicated that participants' learn regulation skills, which is supported by the present evaluation's quantitative findings. Data suggest that participation in surf therapy does strengthen self-regulation, such that youth enrolled in surf therapy for at least seven weeks exhibited less behavioral risk taking and after six months displayed less self-reported sensation seeking. At the same time, male participants reported increased bravery and willingness to try new things.

Findings indicate that participation in surf therapy improves self regulation and encourages positive life choices by strengthening participant inhibition and fostering their bravery and willingness to explore. Surf therapy is a challenging and interesting activity, which Gambone and Abreton (1997) identified as an important element in youth programming. The challenging nature of surfing, facilitated in a trauma-informed manner by caring adults appears to foster participant bravery and agency while also having positive effects on strengthening participant inhibition. Outcomes elucidated in the present evaluation indicate that W4C's surf therapy strengthens safe relationships and self regulation among violence-exposed youth are widely recognized as fundamental aims in trauma-informed psychiatric interventions (e.g. Ford & Blaustein, 2013).

W4C's surf therapy program operates within a low-resource context that is shaped by historical and contemporary interpersonal violence and division. As such, all of the participants who took part in the program evaluation had been exposed to directly experienced or witnessed

violence. In response to the extraordinarily high rates of interpersonal violence and social inequities that shape many children's lives, W4C fosters a trauma-informed environment where its youth participants can learn and practice surfing with caring mentors who come from the same communities as the participants. W4C's surf therapy is facilitated by non-clinician community members, which enables program scalability, and fosters cultural-specificity of the intervention and a safe environment. The process of program evaluation also utilized a community member-facilitated, trauma-informed approach. The approach included training surf mentors conducting data collection. W4C mentors assumed the leadership role of research assistants and collected participants' data so that the participants would feel more comfortable compared to data collection with an unknown adult, particularly of a different culture.

Examining the methodological feasibility and utility of administering behavioral and self-reported measures in a low-resourced context with layperson research assistants was a secondary aim of the evaluation. Participants and program staff reported positive feedback on the BART-Y. *i?* In addition to providing reliable data, the BART-Y was also experienced by participants as enjoyable and game-like, which increased participant engagement. To better understand the self-reported findings of the IOS (social cohesion) and BSSS (sensation seeking), qualitative item-specific information could have been assessed. Through qualitative assessment participants would have had the opportunity to share more about the quality of their relationships with friends and family and their experience with daring or dangerous activities they either avoid or seek out.

Data suggest that the self-report stress assessment, PSS-C, did not reliably measure participants' experienced stress. The scale, which was developed and normed in the United States and may not have been culturally relevant to the South African participants of the present

study. The behavioral self-esteem measure, IAT, also yielded unreliable data, although the measure has been successfully administered in various countries and with youth (e.g. (Bos et al., 2010; Yamaguchi et al., 2007). According to on-the-ground research assistants, the Self-Esteem IAT was confusing for participants and subsequently produced low accuracy rates, which limited the task's interpretability. Limited computer literacy and the use of emoji faces in place of positive or negative attribute words may have contributed to the task's difficulty among participants.

These findings illustrate the importance of administering assessments that are culturally specific rather than relying on a Euro-American centric approach to conceptualizing mental health. Numerous complications emerge when measures are administered in a context where they were not normed, including translational issues of grammatical differences and idioms of distress, and ensuring the validity of measures (Bhui et al., 2003). Considering psychiatric symptom experiences are culturally embedded systems of meaning making (Kirmayer, 2005), the use of psychometric instruments that incorporate local idioms of distress and wellness may better capture individuals' well-being (Jayawickreme et al., 2012). For example, one such cultural idiom of resilience in South Africa is acceptance, or *ukwamukela* (Kim et al., 2019), which was not assessed for in the present evaluation.

Limitations

In addition to the discussed limitations of the perceived stress and self-esteem measures, the study was limited by a highly variable baseline data collection point. Some participants' baseline data collected before surf therapy began whereas other participants had already been enrolled in surf therapy for up to 33 weeks. As such, the data required analyses to be conducted on the baseline data as well as comparing baseline to endline data, which also varied

significantly in weeks of program completed among participants. Because of the inconsistency of participants' time spent in surf therapy at baseline and endline, which was further complicated by not collecting attendance data, the present data may not fully depict the impact of surf therapy on participants' risk-taking, self-esteem, and social cohesion.

Furthermore, complicated ecological factors created challenges for the data collection team to collect data at the exact times and intervals than envisaged. For example 1) The data collection schedule did not always match school terms and data collection would fall during exam times or school holidays; which meant access to participants were not given during those times; 2) As one round of data collection took 90 minutes, collecting one time point's data for a cohort of children took, in some cases, more than four weeks.

Future Directions

Given the social and political stressors within South Africa, future research ought to further investigate the social environment's impact on participants and the mediating role of W4C's surf therapy program. W4C conducts programming in public beaches with students who are referred by government-funded schools within townships. The program interacts directly with numerous social and political structures and as such, surf therapy's possible protective role could be assessed. Such assessment may benefit by using a longitudinal model of measurement that collects attendance data to better understand the dosage effect of surf therapy. The use of culturally specific measures is recommended.

Conclusions

The results of the program evaluation highlight how W4C's surf therapy can be an effective psycho-social intervention in a high-stress environment for children and adolescents

exposed to violence. Findings suggest that W4C provides a community-based intervention that strengthens self-regulation and social cohesion in an under-resourced setting.

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Appendix

Table 1.

Direct Abuse Type	Never	Once	A Few Times	Lots of Times
Somebody broke in/tried to force their way into your home	68.8% (n = 75)	25.7% (n = 28)	4.6% (n = 5)	.9% (n = 1)
Somebody threatened to hurt you really badly	55% (n = 60)	31.2% (n = 34)	8.3% (n = 9)	5.5% (n = 6)
You have been chased by gangs, other kids, or adults	65.7% (n = 71)	18.5% (n = 20)	9.3% (n = 10)	6.5% (n = 7)
Somebody hit, punched or slapped you	26.4% (n = 28)	42.5 (n = 45)	19.8% (n = 21)	11.3% (n = 12)
Somebody stole something from you using violence	67.9% (n = 74)	20.2% (n =22)	6.4% (n = 7)	5.5% (n = 6)
Somebody fired a gun at you or at your home	85.3% (n = 93)	10.1% (n = 11)	3.7% (n = 4)	.9% (n = 1)
Somebody tried to hurt you with a knife or other sharp object	78.9% (n = 86)	11% (n = 12)	5.5% (n = 6)	4.6% (n = 5)
Somebody tried to hurt you by hitting you with a stick, bat, pole or club	61.1% (n = 66)	26.9% (n = 29)	5.6% (n = 6)	6.5% (n = 7)
Somebody threw a bottle, rock or other object at you	28.3% (n = 30)	26.8% (n = 39)	16% (n = 17)	18.9% (n = 20)
Somebody tried to use violence or threats to get you to do	61.8% (n = 68)	22.7% (n = 25)	10% (n = 11)	5.5% (n = 6)

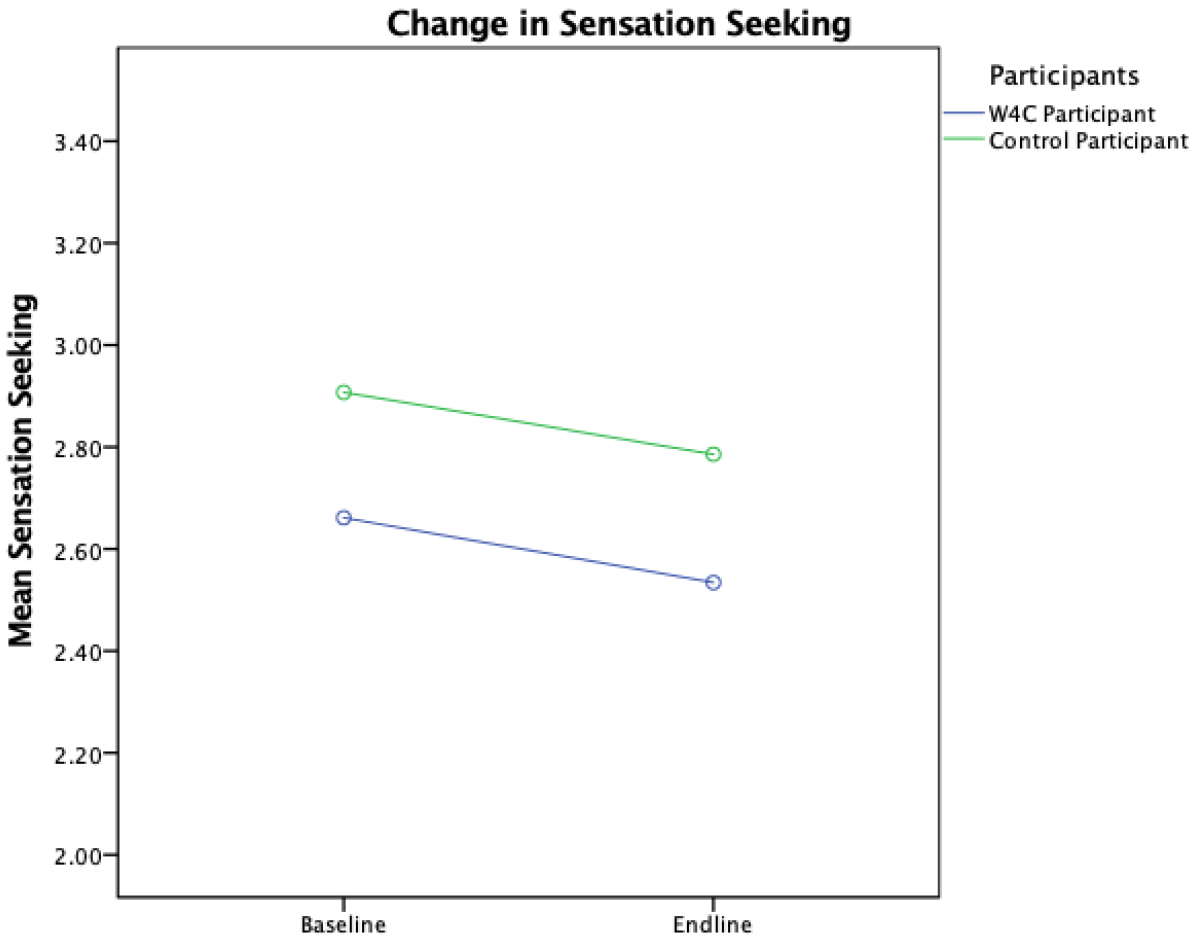
something that you didn't want to do				
You have been arrested or taken away by the police	91.7% (n = 100)	5.5% (n = 6)	2% (n = 1.8)	.9% (n = 1)

Table 2.

Witnessed Abuse Type	Never	Once	A Few Times	Lots of Times
You have seen or heard somebody else get threatened	21.5% (n = 23)	34.6% (n = 37)	19.6% (n = 21)	24.3% (n = 26)
You have seen somebody else get chased by gangs other kids or adults	24% (n = 25)	28.8% (n = 30)	25% (n = 26)	22.1% (n = 23)
You have seen somebody trying to break in or force their way into somebody else's home	43.4% (n = 46)	24.5% (n = 26)	19.8% (n = 21)	12.3% (n = 13)
You have seen somebody else get hit, punched, or slapped	10.1% (n = 11)	18.3% (n = 20)	38.5% (n = 42)	33% (n = 36)
You have seen somebody get robbed or have something stolen from them by force	33.9% (n = 37)	22% (n = 24)	25.7% (n =28)	18.3% (n = 20)
You have seen somebody carrying a gun or other weapon (besides police, etc)	31.8% (n = 34)	32.7% (n = 35)	15% (n = 16)	20.6% (n = 22)
You have seen or heard gunshots	13% (n = 14)	17.6% (n = 19)	24.1% (n = 26)	45.4% (n = 49)
You have seen	33% (n = 35)	24.5% (n = 26)	19.8% (n = 21)	22.6% (n = 24)

someone try to hurt another person with a knife or other sharp object				
You have seen somebody get hit with a stick, bat, pole or club	34.9% (n = 38)	27.5% (n = 30)	23.9% (n = 26)	13.8% (n = 15)
You have seen somebody have a bottle rock or other hard object thrown at them	24.5% (n = 27)	30.9% (n = 34)	28.2% (n = 31)	16.4% (n = 18)
You have seen somebody get arrested or taken away by the police	14.7% (n = 16)	33.9% (n = 37)	19.3% (n = 21)	32.1% (n = 35)
You have seen a dead body (besides funerals, etc)	42.2% (n = 46)	22.9% (n = 25)	16.5% (n = 18)	18.3% (n = 20)
You have seen or heard somebody trying to use force or threats to get another person to do something they didn't want to do	41.3% (n = 45)	27.5% (n = 30)	14.7% (n = 16)	16.5% (n = 18)
You have seen somebody get killed	56.9% (n = 62)	19.3% (n = 21)	13.8% (n = 15)	10.1% (n = 11)

Graph 1.



Note. Repeated measures ANOVA reveals changes in reported sensation seeking from baseline to endline.