Teen Mental Health Literacy: A School District's Post-Pandemic Response

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Abstract

Mental health challenges are becoming a significant public health issue for adolescents/teenagers, and primary interventions have been focused on mental health education. Because adolescents spend most of their time in school, primary mental health interventions should be prioritized in this setting. A PICOT question was developed to determine if mental health literacy (MHL) in adolescents would improve while decreasing stigma and improving help-seeking behaviors after a program of enhanced mental health education. Partnering with a large Arizona suburban school district social work department, a teen Mental Health First Aid (tMHFA) pilot program was implemented for a class of nine (n = 9) adolescent students (aged 17-18 years) old during the school day. tMHFA was delivered in three 90-minute class days. Using the Mental Health Literacy questionnaire (MHLq), a pre and post-test design revealed a significant (p value=less than 0.05) increase in the students' MHL, help-seeking behaviors, and decreased stigma after delivery. This quality improvement project was IRB approved, and all human subjects' rights were protected. In conclusion, there is strong evidence that enhanced mental health programming, such as tMHFA, effectively educates adolescents about mental health challenges and, perhaps, could promote behavioral changes in future generations.

Keywords: adolescents, help-seeking behaviors, in-school mental health education, mental health literacy (MHL), stigma, teen Mental Health First Aid (tMHFA)

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Adolescent mental health disorders are a growing public health issue globally for adults and children. While mental health problems affect all races, genders, and socioeconomic statuses, they disproportionately affect those with lower income due to multiple factors, most notably access to mental health services. Because adolescents spend most of their time in school, interventions focusing on mental health education, reducing stigma, and increasing helping-seeking behaviors may be of benefit.

Problem Statement

Health professionals are identifying a sharp increase in the need for mental health resources worldwide for adults and the adolescent population (American Psychological Association, 2021). The transition from child to adolescent and primary school to secondary school contains many personal and environmental changes (Ogden & Hagden, 2018). The World Health Organization (WHO) has recently published guidelines to help promote evidence-based recommendations and inform policy change to benefit adolescents across the globe, entitled Helping Adolescents Thrive (World Health Organization, 2020). Adolescents struggle with mental health disorders, but depression, anxiety, and behavioral disorders are the most common (World Health Organization, 2021). In a landmark article written by mental health experts worldwide, globally, children and adolescents make up one-third of the world's total population. Ninety percent of those children live in low- to middle-income countries (Kieling, 2011). Kieling et al. (2011) also estimates that 10-20% of these children are affected by mental health problems. The CDC (Centers for Disease Control and Prevention (2021) estimates that one in five children struggle with mental health problems, and only twenty percent of those children receive professional help. According to the U.S. Department of Health and Human Services (n.d.),

almost 50% of adolescents met the criteria for a mental health disorder at some point. The recent COVID-19 pandemic has exacerbated these problems.

Suicide, often an effect of untreated mental illness, has been steadily on the rise in the state of Arizona over the last ten years for all ages groups; however, adolescent suicide in Arizona (specifically ages 15 and under) has increased by over three-fold (Arizona Department of Health Services, 2020). Societal costs, including lifetime medical fees and lost work costs attributed to suicide, are estimated at 93 billion nationwide (America's Health Rankings, 2022).

Purpose and Rationale

Because fifty percent of all mental illness begins by fourteen, adolescent mental health is an important issue globally (National Alliance on Mental Illness, 2021). According to the National Alliance on Mental Illness (2021), one in six adolescents experience mental illness, and most remain untreated. There is a gap in identifying these adolescents and the availability of proper treatment. This issue affects the adolescents dealing with mental health problems, their families, and friend groups. This paper aims to explore the depth of the problem globally, nationally, and locally and review the best evidence to solve the problem.

Background and Significance

It is easy to see, with staggering statistics, the significance of the issue of adolescent mental health. The problem is significant, and there are many factors involved. In December of 2021, the United States Surgeon General, Vivek Murthy, issued a national advisory on the issue of youth mental health. He cited the sharp increase in anxiety, depression, and suicide over the past two decades and recognized the current COVID-19 pandemic's effect on adolescents (U.S. Surgeon General, 2021). President Biden's fiscal year 2022 budget called for more than double the amount allotted for mental health aid in the adolescent population, including more than a

billion dollars to implement a new mental health school professionals' program. This program will help hire nurses, social workers, counselors, and other mental health professionals in school districts (The White House, 2021). In 2021, the state of Arizona mandated mental health education in all public schools (Policy Engage, 2022). The following will describe the specific population, interventions researched, current research to combat this problem, and the desired future state.

Population

The definition of the adolescent population is broad and varies among different studies. For this discussion, the ages between 12 and 18 describe male and female adolescents/teenagers. This document will use both terms " Adolescents" and "Teenagers " to define the same population.

Adolescents with mental health problems encompass various mental health disorders, including anxiety, depression, and behavioral disorders. According to Griffin and McMahon (2020), the onset of most mental illnesses is during adolescence, and most mental distress stays within the community and does not become known to clinical services. Researchers agree on many reasons why an adolescent may not receive care. Mental health stigma is one of the most significant reasons adolescents and their families do not seek treatment (Simkiss et al., 2020; Fretian et al., 2021; Breet et al., 2021; Lindow et al., 2020). Stigma is a feeling of shame about admitting one may have a mental health problem. First coined by Jorm et al. (1997), mental health literacy refers to the general lack of understanding of mental health problems and their treatment ability. Researchers also describe a lack of mental health literacy as a risk factor for not receiving mental health treatment (Simkiss et al., 2020; Fretian et al., 2021; Bjornsen et al., 2018; Radez et al., 2021).

Interventions

Working with Supportive Adults

Improving parental mental health literacy is one way to combat adolescent mental health struggles. Using a one-hour web-based program, Haine-Schlagel et al. (2016) were able to target caregiver participation engagement and, therefore, significantly improve the mental health of those adolescents. Again in 2021, Haine-Sclagel et al. (2021) conducted a systematic review of multiple caregiver-centered programs to influence adolescents and found these methods effective. Parent-centered interventions were also favorable in Finan et al.'s (2018) study. The authors claim that while most parents think their presence is unnecessary for adolescents compared to younger, the opposite is true. A program designed to inform parents, teachers, and supportive adults; Youth Mental Health First Aid (MHFA) has been internationally successful. Geared for helping adults empathize, support, and speak with adolescents experiencing a mental health crisis (National Council for Mental Wellbeing, 2022). In a recent randomized control trial, MHFA showed a significant improvement in the mental health literacy of these adults not only immediately after delivery but also three years post-intervention (Morgan et al., 2020). Improving mental health literacy and battling stigma by intervening with the trusted adults in adolescents' lives may be a way to combat the pandemic of adolescent mental health.

Adolescent Mental Health Literacy

The vast majority of students attend school for multiple hours per day, and this becomes an optimal time for interventions to improve mental health literacy and reduce stigma. Programs to battle mental health literacy and stigma in secondary schools seem to be an effective and relatively recent evidence-based practice studied worldwide. Little research exists detailing successful mental health literacy programs in practice in the United States. Kutcher and

colleagues have implemented a successful mental health literacy program in Canadian secondary schools, taught by teachers that were so successful it has been widely adopted across the country (Kutcher et al., 2020). Five Norwegian school districts adopted MEST (Norwegian word for coping) across secondary schools and significantly improved the mental health literacy of their students over a year. In Wales, "The guide Cymru" (Cymru means mind in Welsh) mental health education is currently being implemented across the country in secondary schools. All 205 secondary schools will be invited to participate and could include over 30,000 grade nine students. Researchers are conducting a large-scale randomized control trial to measure the program's success (Simkiss et al., 2020).

Comparison

Currently, 20% of adolescents have mental health problems (Mojtabai et al., 2020). Based on an extensive study, Mojtabai et al. (2020) discovered that there was a moderate increase in adolescents seeking help for internalizing mental health problems (depression, anxiety) between 2005 and 2018 and that this, along with those already accessing outpatient mental health services, is placing new demands on specialized adolescent mental health resources. Parents are having trouble accessing help for their adolescents, encountering long waitlists (up to six months, and services they cannot afford (Oberklaid, 2018; Wilson,2020). Researchers admit that with so much trouble accessing help, there is no surprise that adolescents are experiencing a crisis. The pandemic of adolescent mental health is a local, national, and global issue that needs evidence-based solutions and community support.

Future State

The potential benefits of mental health prevention and education are new and exciting. Promoting mental health literacy and decreasing stigma has shown promise, and new evidence-

based curriculums are developing (Wilson, 2020). Wilson (2020) states that no matter the intervention is chosen, it must be youth-focused, integrated, and have a whole-school, whole-community approach to equip young people with the tools to manage their mental health. Supporting research from low to middle-income countries related to this same topic must also be encouraged as there is little to date, and this research is needed (Wilson, 2020). The Centre for Community Child Health (2018) published a policy brief calling for innovation in child mental health. It asks policymakers to devote time, energy, and funds to an integrated and coordinated approach encompassing prevention, promotion, and early intervention while also calling out a recognized equity gap.

After reviewing research and literature surrounding adolescent mental health, it is apparent that there is much room for improvement through promotion, prevention, and intervention. There is no one best way to accomplish these changes; however, some evidence-based approaches have been statistically significant and practical through randomized control trials. Using a youth-centered system and establishing family, community, and school support stand the best chance to make a difference.

Internal Data

A large school district in suburban Phoenix, Arizona, is dealing with the current adolescent mental health crisis throughout its organization. The school district is a mixture of Title 1 schools (schools serving a large percentage of students with a low socioeconomic status) and schools in highly affluent areas. They struggle to meet the needs of their students battling mental health challenges. The school district serves over 45,000 students and aims to empower all students with the knowledge, skills, and attitude necessary to excel in college, career, and life. This school district is fortunate to have at least one licensed social worker at all high school sites

and multiple guidance counselors. Even with this benefit, the school district struggles with mental health stigma (both from students and parents), lack of mental health education, overwhelming social and emotional referrals, and a lack of readily available resources in the community to refer families to when there is an identified mental health problem. Recently, in 2022 the district had four completed student suicides within its high school in a span of three months. The school district is actively looking for ways better to serve its students and families in this realm.

PICO Question

A literature review on adolescent mental health led to the clinically relevant PICO question: In adolescent students (age 13-18 years old), does an enhanced school-based mental health education program compared to current standard school district mental health education affect mental health literacy?

Search Strategy

An extensive review of the most current evidence was performed to answer the PICOT question. Four databases were searched, including PsycINFO, PubMed, and the Cumulative Index of Nursing and Allied Health Literature (CINAHL). These databases were chosen due to their relevance to adolescents and mental health literacy and their rigor and reliability of contributions to the medical field.

Keyword Selection

The databases were searched using combinations of keywords that attempted to address all aspects of the PICOT question. Population keywords included: *adolescents, teenagers, high-schooler, and teens*. The terms *mental health promotion, mental health education, mental health literacy, enhanced mental health program, and youth mental health first aid* were used to

describe the intervention. To narrow the search for manageable results and strengthen the relevance to the PICOT question, *school*, *school-based,* and *enhanced mental health education* was added.

Initial and Final Search Yields

PubMed

An initial search of PubMed using key terms *adolescent, teen,* and *mental health promotion* or *mental health literacy* yielded over 9,000 results. *School-based, school* and *enhanced mental health program* were added to narrow results. This search resulted in over five hundred studies. *Youth mental health* was added to the search, and results became manageable at 291. After the final review, five articles were retained for rapid critical appraisal and relevance to the PICOT question.

CINAHL

A CINAHL database search started with the terms *adolescent, teen,* and *mental health literacy,* and *school-based mental health*. Boolean phrase search modes were applied, and this search yielded 382 results. Full-text limitations were added as well as peer-reviewed publications within the years 2019-2022, and this narrowed the search to 38 high-quality results. After a final review, two articles were retained for rapid critical appraisal and relevance to the PICOT question.

PsycInfo

Similar search terms were used to search PsycInfo. The initial search resulted in over forty-six thousand results *using teen, adolescents* and *mental health literacy*. It was subsequently narrowed upon adding *mental health education* or *enhanced mental health education.* Final yields totaled 611. After adding school results narrowed to 149. After reading the abstracts of the

first 100 studies and scanning for relevance, three studies were retained for rapid critical appraisal and relevance to the PICOT question.

Limitations, Inclusion, and Exclusion Criteria

Search limits were set in each database to include peer-reviewed articles, publications between 2018-2022, and only English language. Randomized control trials, clinical trials, systematic reviews, and full text were added to the limitations later in searches to narrow and guarantee high-level evidence. The titles and abstracts of all articles were reviewed for relevance up to 100 articles per database search. Ten high to moderate level evidence studies were chosen to address the PICOT question appropriately and a critical appraisal tool was performed on each. There are two systematic reviews, six randomized control trials, and two qualitative studies that will represent the literature review (Appendix A).

Critical Appraisal and Synthesis of Evidence

A critical appraisal was performed with the top ten studies chosen for evaluation. Studies included multiple RCTs, cross-sectional studies, cohort studies, and one qualitative study. Two systematic reviews were appraised, with one study using qualitative research. Using a Rapid Critical Appraisal tool (Melnyk, 2019), each study was appraised for rigorous scientific method, reliability, validity, and best answering the PICOT question.

Overall, viewing the Synthesis Table (Appendix A), the quality of evidence was highly homogeneous considering the limitations understood surrounding children and mental health issues. It was inferred that most studies used a cognitive-behavioral theory to guide their research. This is congruent with the research question in most studies, asking, “How does enhanced mental health education improve mental health literacy, reduce stigma, and increase help-seeking behavior?”. Perhaps the most significant synthesis between studies was that all

studies used 13–18-year-old teenagers as subjects, and all of the interventions were delivered in a high school setting. Using valid and reliable questionnaires/tools, all studies measured a school-based, enhanced mental health education program for this population using accurate and reliable questionnaires/tools. Each study defined the variable differently but ultimately used mental health literacy (MHL) as a variable to judge their intervention's success. In all but one study, which provided mixed results, an increase in mental health literacy was determined after the intervention.

Weaknesses of the research appraised in the Synthesis Table (Appendix A) included a very high attrition rate among all studies due to student attendance. Half of the studies had study designs with a high probability of bias, such as pretest-post designs. The authors and researchers on multiple studies were also the scholars who developed the enhanced mental health education intervention studied, which implies some bias. Heterogeneity was also seen across all studies regarding the instrument used to measure the outcomes, which is important when evaluating interventions consistently.

Theory/Theoretical Framework Application

The Theory of Planned Behavior (Ajzen, 1991) describes a person's attitudes, perceived norms, and perceived behavioral control predicting behavior and behavioral intentions. In this project, an enhanced mental health literacy program will be delivered to adolescents in school to answer the PICOT question. The intention will be to improve adolescents' mental health literacy through education in an effort to change their attitudes, perceived norms, and perceived behavioral control about mental health diseases. The theory poses that if one of these variables can be changed that this can change a person's planned behavior. This theoretical model is congruent with this project's aims and helps explain the relationships between mental health

literacy and future planned behavior towards those suffering from mental health problems (Appendix B, Figure B1).

Implementation Framework

The Iowa Model of Evidence-Based Practice (IMEBP), (Appendix B, Figure B2) assists practitioners with knowledge research, transformation, and implementation of that knowledge into clinical practice (Titler et al., 2001). It is a guide that aids in identifying "triggers" or problems within an organization with "stakeholders" and determining whether these "triggers" are organizational priorities. The IMEBP is comprehensive and assists in decision-making while providing details specific to pilot project implementation. The specific requirements of pilot project implementation are fitting while working with a public school organization. The model allows for consideration of the entire organizational system from all angles. It includes several feedback loops, reflecting analysis, evaluation, and modification based on assessing processes and outcomes (Titler et al., 2001). The final step in IMEBP is to evaluate the pilot project's success, disseminate its results within the organization, and recommend a practice change. This step is also synchronous with presenting evidence of a pilot project to a school board or administrators and suggesting of changes within the curriculum.

Implications for Practice Change

After an exhaustive literature search and synthesis of high-quality research, an enhanced mental health education program was piloted within a large suburban school district in Arizona. With the help of enthusiastic stakeholders within the social work department of the district, tMHFA was provided to students within the district in a chosen secondary school. The program was evaluated with reliable measurement/tools, and data was collected using a pre-test/post-test

survey format. The pilot program measured the effects of tMHFA on students' mental health literacy, mental health first aid skills, and help-seeking behaviors.

Planning the Intervention

This QI project aims to evaluate the effects of teen Mental Health First Aid (enhanced mental health programming) on the mental health literacy of adolescents in the school district and determine if this enhanced education is superior to current district-wide mental health education. Teen Mental Health First Aid will be delivered to high-school juniors with the help of district social work department and teachers during a required curriculum class. These social workers are stakeholders in this project. They are highly interested in bettering the mental health and resources of the student population. The director of social work and school board members are proponents of mental health literacy initiatives. Students, parents, and teachers in the district are stakeholders with a vested interest in the well-being of students.

Created in Australia, teen Mental Health First Aid (tMHFA) is a classroom-based mental health literacy program for students aged 15-18 (Hart et al., 2018). A robust program consisting of three 90-minute classroom sessions, tMHFA promotes mental health literacy and help-seeking behaviors and attempts to reduce stigma while teaching adolescents to help a peer or friend through a mental health crisis.

First, a "train the trainer" program was completed by the researcher/author and social workers involved in teaching teen Mental Health First Aid. A budget was created, and the majority of the budget expenses were be paid by the school district (see Appendix C). As required by the Mental Health First Aid organization, an entire grade level of juniors were chosen to receive the intervention (enhanced mental health literacy programming) by the school district. The district used budget monies to pay for the "train the trainer" program and supplies

(including manuals) for the program, and the implementation was scheduled during the fall of the school year 2022-2023. Eleventh-grade student received three 90-minute classroom sessions on non-consecutive days (Monday, Wednesday, and Friday). Before the first in-person class started, the MHLq (on paper) was passed out to students participating in the QI project. They filled out the questionnaire, which the researcher collected and stored. After the last 90-minute session, the MHLq was administered again, and the researcher compiled the results. Results were tallied and statistically analyzed to determine the effect of teen Mental Health First Aid on mental health literacy, help-seeking behaviors, and stigma.

Participants and Recruitment

Eleventh-grade students attending high school within the district were the subjects of this QI project. The district chose one high school location and provided class instruction time for the intervention. Participants were registered for in-person classes in the eleventh grade. Parental consent was required to receive teen Mental Health first aid. Parental consent and student assent were reuired to participate in the quality improvement evaluation process, including a pre-and post-questionnaire. Exclusions include students younger than fifteen years old and students who did not have parental consent or personal assent. These parameters are in place due to organizational constraints of the teen Mental health Forst Aid program and school district organizational policies. Every step was taken to protect students from undue harm, promote student/parent choice, and follow organizational policies and procedures.

Recruitment occurred via permission slip distribution in the classroom. Teachers presented permission slips in class and described the project and evaluation question. All eleventh graders were possible subjects and those with completed parental consent and student assent were given the intervention and pre-and post-questionnaires. These questionnaires served

as statistical results and answered the evaluation question.

Data Collection and Outcomes Measurement

The baseline and post-intervention mental health literacy (MHL) was measured using the Mental Health Literacy Questionnaire (MHLq) developed by Campos et al. (2016). Permission was granted to use this tool by Louisa Campos. This 34-item questionnaire evaluates mental health literacy, help-seeking behaviors, and stigma (see Appendix D). Thirty-three Likert scale items and one multiple-choice item measure mental health first aid skills, help-seeking, knowledge, stereotypes, and self-help strategies (the scale is separated by scoring these three factors separately). Participants score each statement or idea between "strongly disagree" (1) or "strongly agree (5) with an option of "neither agree nor disagree " for each item (Campos et al., 2016). The questionnaire showed good internal consistency (total score $\alpha = 0.84$; Factor 1: First aid skills and help-seeking - $\alpha = 0.79$; Factor 2: Knowledge/stereotypes - $\alpha = 0.78$; Factor 3: Self-help strategies - $\alpha = 0.72$); and excellent test-retest reliability, the Interclass Correlation Coefficient (ICC) for the total score of the MHLq was 0.88, and for the three dimensions of MHLq was 0.80 (Factor 1), 0.90 (Factor 2) and 0.86 (Factor 3) (Campos et al., 2016).

The MHLq directly correlates with this project's theoretical framework. Using education and increased mental health literacy, the researcher attempted to change teen attitudes, perceived norms, and perceived behavioral control about mental health diseases. The theory poses that if one of these variables can be altered that this can change a person's planned behavior.

Student privacy was honored throughout the data collection process. Using a four-digit code (the last four digits of their phone number), students numbered their pre-and post-questionnaire to link the questionnaires. All questionnaires were completed on paper on the first

and last days of instruction. No names or personal identification questions were required to participate. Students were asked demographic questions indicating biological sex, race, and age. At the end of the survey, one subjective question was added to evaluate student opinions of the programming. The researcher stored the completed pre-and post-questionnaire in their home for one month while the results were transcribed. After data collection was finished, the questionnaires were shredded.

Results

Descriptive statistics were calculated to describe the project population sample. There were a total number of nine students that completed the study (n=9). The average age of the participants was seventeen years old (sd=.53). Ages ranged from seventeen to eighteen years old. Participants included seven female students and two male students.

A two-tailed paired samples t-test was conducted to determine the difference between the pre-test MHLq total score and the post-test MHLq total score. A Shapiro-Wilk test was conducted to determine whether the differences in pre-test MHLq and post-test MHLq could have been produced by a normal distribution (Razali & Wah, 2011). The results of the Shapiro-Wilk test were not significant based on an alpha value of .05, $W = 0.93$, $p = .503$. This result suggests the possibility that the differences in pre-test MHLq and post-test MHLq were produced by a normal distribution cannot be ruled out, indicating the normality assumption is met.

The result of the two-tailed paired samples t-test was significant based on an alpha value of .05, $p = .005$, indicating the null hypothesis can be rejected. This finding suggests the difference in the mean of pre-test MHLq and the mean of post-test MHLq was significantly different from zero. The mean of pre-test MHLq was significantly lower than the mean of post-test MHLq. The results are presented in Table 1.

Table 1
Two-Tailed Paired Samples t-Test for the Difference Between Pre-test MHLq Total and Post-test MHLq Total

Pre-test MHLq		Post-test MHLq				
M	*SD*	*M*	*SD*	*t*	*p*	*d*
134.78	10.32	144.89	12.44	-3.90	.005	1.30

Note. N = 9. Degrees of Freedom for the *t*-statistic = 8. *d* represents Cohen's *d.*

The three factors included in the MHLq were statistically analyzed to answer the evaluation question. The following tables will outline each factor.

The observations for Pre-First Aid skills had an average of 39.44 (SD = 3.47, Min = 36.00, Max = 47.00). The observations for Post-First Aid skills had an average of 43.44 (SD = 4.10, Min = 35.00, Max = 48.00). The summary statistics can be found in Table 2.

Table 2
Summary Statistics Table for First Aid Skills

Variable	*M*	*SD*	*n*	Min	Max
Pre-test First Aid skills	39.44	3.47	9	36.00	47.00
Post-test First Aid skills	43.44	4.10	9	35.00	48.00

The observations for Pre-test Mental Health (MHL) had an average of 76.00 (SD = 6.32, Min = 64.00, Max = 84.00). The observations for Post-test Mental Health Literacy (MHL) had an average of 79.33 (SD = 7.48, Min = 65.00, Max = 87.00). The summary statistics can be found in Table 3.

Table 3

Summary Statistics Table for Mental Health Literacy

Variable	*M*	*SD*	*n*	Min	Max
Pre-test MHL	76.00	6.32	9	64.00	84.00
Post-test MHL	79.33	7.48	9	65.00	87.00

The observations for Pre-test Help Seeking had an average of 19.33 (SD = 3.28, Min = 14.00, Max = 25.00). The observations for Post-test Help Seeking had an average of 22.11 (SD = 2.62, Min = 17.00, Max = 25.00). The summary statistics can be found in Table 4.

Table 4

Summary Statistics Table for Help Seeking Behaviors

Variable	*M*	*SD*	*n*	Min	Max
Pre-test Help Seeking	19.33	3.28	9	14.00	25.00
Post-test Help Seeking	22.11	2.62	9	17.00	25.00

Discussion

tMHFA programming yielded significantly statistic results in both the overall score of MHLq and on the three factors studied by MHLq. Beyond these objective results, it was also found that teenagers subjectively felt they learned from the programming and enjoyed it. Some barriers to the project were student attendance, difficulty scheduling curriculum time during the school day, and the availability of school professionals to aid in teaching. Similar studies of school-based mental health programming found attendance to be the largest barrier to educating children (Hart et al., 2018; Lindow et al., 2019; Morgado et al., 2020). Based on the scientific positive significance of similar studies evaluating the benefit of in-school enhanced mental health education, it can be concluded that any enhanced mental health literacy programming benefits teenagers if experienced professionals teach it. It is recommended that a larger pilot be

conducted through the school district to evaluate the effectiveness and feasibility of adding tMHFA to its curriculum.

In conclusion, mental health challenges are a growing issue for adolescents across the globe. Primary intervention strategies pose education as the number one prevention strategy. Because teens spend most of their time in school, it makes sense to intervene with mental health education embedded in the curriculum. This pilot quality improvement project is the first step in creating a sustainable, enhanced mental health education program for the school district. Quality improvement is often an iterative process requiring many revisions to prove successful change. After completing this project, its results will be disseminated to the district school board. Hopefully, this will create awareness of students' need for additional mental health education. The social work department, specifically the school district's director of social workers as a primary stakeholder, will be essential in advocating for enhanced mental health programming for students and larger pilots to prove the effectiveness of tMHFA.

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Appendix A

Evaluation and Synthesis Tables

Table A1

Evaluation Table for Quantitative Studies

Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice; Generalization
Hart et al., (2018), Helping adolescents to better support their peers with a mental health problem: A cluster-randomised crossover trial of teen Mental Health First Aid. **Country:** Australia **Funding:** a Mental Health Research grant given to one of the authors. Grant had no influence on the study	Inferred Cognitive Behavioral Theory	**Design:** RCT, CRXO **Purpose:** Testing the effectiveness of tMHFA program intervention in 4 grade ten high schools	n= 1942 students **Demographics:** 10th grade students across 4 schools (age 14-18). 55% male, 28% female **Setting**: government-funded schools, all students given intervention during school over 3-75min courses **Exclusion**: parental opt out, other recent mental health training	**IV1: tMHFA** **IV2: PFA** **DV1:** quality of first aid intentions **DV2: MHL** **DV3: SA** **DV4**: problem recognition **Definitions:** **tMHFA** -video vignettes, role-plays, group discussion, small group work and workbook activities related	**Tools:** pre and post surveys, K6 SDS, DSS **Validity/ Reliability:** an assumed 0.70 correlation between pre and post measurement gives the study 0.80 power to detect small **(*d*=0.17)** group by group measurement occasion differences at ***a*=0.05.**	**Statistical Tests Used:** MEM, Revelle's omega total for total scores and subscales. Stata 13 was used for analyses and Cohen's calculated.	**DV1: *ds*=0.50-0.58, P=<0.001** **DV2: *ds*=0.12-0.40, p=<0.001** **DV3: *ds*=0.15-0.41 p=<0.001** **DV4:p=<0.001** multiple variables were tested against tMHFA and all but one	**Level of Evidence:** Level 2 evidence, strong. **Strengths**: large sample size, cross over trial design **Weakness:** lower performing schools were not studied, high attrition **Feasibility**: feasible to replicate with the buy in of parents and teachers **Application:** significant improvement in all dependent variables, proof that tMHFA could be beneficial in other school districts.

Key: **ASQ-N**-Adolescent Stress Questionnaire, **ATE**-average treatment effect, ***a***-Cronbach's alpha, **CG**-control group**, CRT**-Cluster Randomized Trial, **CRXO**-cluster randomized crossover, ***ds***=effect sizes, **DS**- databases searched, **DSS**- depression stigma scale, ***d***=Cohen's measure, **EG**-experimental group, **GEE**- generalized estimating questions, **GHSQ**- General Help Seeking Questionnaire, **HSB**-help-seeking behavior, **K6**-K6 Psychological Distress scale, **LTS**- Likert type scale, **M**-mean, **MEM**- mixed effects model, **MEST**-short version of the Norwegian word for coping**, MHL**-mental health literacy, **MHLq**-Mental Health Literacy Questionnaire, **MHPK-10**-Mental Health Promoting Knowledge, **MWB**-mental well-being, ***p***=significance**, NFSB-** Non-fatal Suicidal Behavior**, PFA-**Physical First Aid **, PGSPS-**Perceived General Support from Parents Scale**, PMeHL**-positive mental health literacy, **PRISMA-**Preferred Reporting Items for Systematic Reviews and Meta-Analysis**, QCRCT**- quasi-cluster randomized control trial**, QEPPD-**Quasi-experimental pretest-posttest design**, RCT**-randomized control trial, **RIBS-**Reported and Intended Behavioral Scale**, SA-**stigmatizing attitudes, **SDS-**social distance scale**, SDQ-**strengths and difficulties questionnaire, **SP**-suicide plans, **SR**-systematic review, **SWEMWBS-**short Warwick-Edinburgh Mental Well-being scale**, T2-**comparison test, post-test**, tMHFA**-teen Mental Health First Aid, **WEMWBS**-Warwick-Edinburgh Mental Well-being Scale, **YAM**-Youth Aware of Mental Health, **YMHFA**-Youth Mental Health First Aid

Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice; Generalization
Bias: Two authors (Kelly and Jorm) are tMHFA tMHFA board members.			**Attrition:** 56%	to helping a friend through a mental health crisis. **PFA-**CPR, AED medical crisis training			showed significant improvement	
Morgado et al., (2021), Adolescents' empowerment for mental health literacy in school: A pilot study on ProLisMental psychoeducational intervention **Country**: Portugal **Funding**: National Funds through FCT **Bias**: conditioning retention and randomization	inferred Cognitive Behavioral Model	**Design: QCRCT,** single blinded **Purpose**: Testing the effectiveness of MHL program ProLisMental	n= 67 **Demographics:** 9th grade high school students, 63% female, 36.8% male, average age 14.50 **Setting**: school **Exclusion**: parental opt out, special education, students already engaged in study	**IV1:** ProLisMental MHL program **DV1:** anxiety recognition **DV2:** anxiety prevention **DV3**: anxiety self help **Definitions:** ProLisMental-psychoeducational program to improve students'	**Tools:** QuALiSMental **Validity/ Reliability:** Portuguese version of "Survey of MHL in young people-interview version". No info on reliability of tool.	**Statistical Tests Used:** Cochran Q with Dunn's post-hoc procedures, adjusted with Bonferroni's significance correction, chi-square test	**DV1:** *p less than 0.001* **DV2:** *p* less than 0.05 **DV3:** *p* less than 0.01 Variables measured at three different times. Showed significant increase in all three variables	**Level of Evidence:** Level 2 evidence, strong. **Strengths**: small study, easy to replicate **Weakness:** high attrition, small sample size **Feasibility**: feasible to apply this study on a larger scale in a school setting **Application:** significant improvement in all variables proving that MHL can be improved.

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice; Generalization
			Attrition:29 students did not complete, high	mental health on anxiety at school.				
Bjornsen et al., (2019). The relationship between positive mental health literacy and mental well-being among adolescents: Implications for school health services **Country**: Norway **Funding**: Research Council of Norway **Bias**: none stated	inferred Cognitive Behavioral Model	**Design:** cross sectional, observational **Purpose**: using survey examine the relationship between **PMeHL** and **MWB** to discuss its implications for school health services	n= 1,888 **Demographics:** 15-21 yo (mean age 17.02 yo), 51% female, 48% male **Setting**: 5 suburban high schools, similar socioeconomic status **Exclusion**: survey not completed, no parental consent, age out of range **Attrition:** survey format, response rate 97.3%	**IV1:** survey **DV1:** background variables including gender, age, education, parents living status, birthplace **DV2:** Stress **DV3: MWB** **DV4: PMeHL** **Definitions: PMeHL-** addresses an individual's understanding of how to obtain and maintain good mental health	**Tools: ASQ-N, MHPK-10, WEMWBS** **Validity/ Reliability:** all tools validated and reliable	**Statistical Tests Used:** STATA statistical program was used. Cohen's d was used to detect effect sizes. Multiple linear regression model assessed relationship.	**DV1:** boys scored higher on **MWB;** girls scored higher on **PMeHL. DV2**: Stress correlated with lower **MWB. DV3:** Positive **MWB** correlated significantly and positively with **PMeHL. DV4: PMeHL** was a significant explanatory variable of mental well-being	**Level of Evidence:** level 5 evidence **Strengths**: large sample size, easy to replicate **Weakness:** low level evidence, fixed responses, self-reporting bias possible, subjects are of higher socioeconomic status, results may not be transferrable. **Feasibility**: feasible to apply this study on a larger scale. **Application:** proves that schools are an appropriate space to promote **PMeHL.**

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice; Generalization
				MWB-subjective well-being and psychological functioning				
Morgan et al., (2020) Long-term effects of Youth Mental Health First Aid training: Randomized controlled trial with 3-year follow up. **Country**: Australia **Funding**: National Health and Medical Research Council **Bias**: authors are also authors of **YMHFA** course	inferred Cognitive Behavioral Model	**Design:** RCT **Purpose**: evaluating long term effects (after year 3) of Youth Mental Health First Aid class on parents and adolescents	N= 384 dyads n=87 parents and 81 adolescents at 3-year follow-up **Demographics:** similar socioeconomic characteristics, adolescents mean age 16.5, 55% percent female **Setting**: computerized telephone interviews conducted 3 years after initial study **Exclusion**: none were excluded from current study **Attrition:** 53.7%	**IV1: YMHFA** **IV2: PFA** training. **DV1:** parental support **DV2:** adolescent mental health/cases of adolescent mental health problems **DV3: MHL** **Definitions:** parental support-how much adolescents felt supported by parents	**Tools: SDQ, K6, SDS, PGSPS** **Validity/ Reliability:** **SDQ – *a*** >.70 **K6-*a***=>.84 **SDS- *a***=<.80 **PGSPS-*a***=>.77	**Statistical Tests Used:** STATA statistical analysis, mixed effects models, Cohen's d	**DV1**: small to medium improvements parental knowledge about mental health problems ***p***=<0.05after 3 years **DV2**: smaller number of cases after 3 years, difference not significant ***p***=<0.05 **DV3:** ***p***=<0.001, significant improvement in **MHL**	**Level of Evidence:** Level 2 evidence, strong. **Strengths**: **RCT** **Weakness:** lower performing schools were not studied, high attrition, low sample size and therefore low effect size **Feasibility**: feasible to replicate with the buy in of parents and teachers **Application:** even though small effect size, evidence shows improvements in MHL long term (3 years later)

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice; Generalization
			of parents/adolescents did not complete follow up study				sustained across 3 years.	
Bjornsen et al., (2018). Exploring MEST: a new universal teaching strategy for school health services to promote positive mental health literacy and mental wellbeing among Norwegian adolescents. **Country**: Norway **Funding**: Research Council of Norway. **Bias**: none reported	inferred Cognitive Behavioral Model	**Design:** collecting cohort data from pre and post intervention. **Purpose**: investigate the outcome differences in positive MHL and mental wellbeing between adolescents who participated in **MEST** and those who did not.	**N=** 357 **Demographics:** 15-21 years old. Of the MEST participants 79 were females and 30 were males. **Setting**: five suburban Norwegian high schools, higher socioeconomic status. **Exclusion**: students who did not attend MEST, students who did not receive the questionnaire by teacher choice **Attrition:** 34.2%	**IV1: MEST** **DV1: ATE** of positive **MHL** **DV2: ATE** of mental wellbeing **Definitions:** MEST is a voluntary MHL promotion and mental health wellbeing program designed for high school adolescents.	**Tools: MHPK-10, SWEMWBS** **Validity/ Reliability: MHPK-10-*a*=.81** **SWEMWBS-*a*=.88**	**Statistical Tests Used:** STATA, T-tests, independent T-tests, paired samples T-tests, Chi-square tests	**DV1**: increased significantly (p=.02) **DV2**: no significant change was found between MEST and non-MEST participants.	**Level of Evidence:** Level 4 evidence. **Strengths**: high level evidence, longitudinal data **Weakness:** high attrition, possibly not fully randomized, recall bias **Feasibility**: easily reproducible at other schools. Did not require special teacher education. **Application:** Programs like MEST could be used in other schools to produce similar results.

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Lindow, et al., (2019). The Youth Aware of Mental Health intervention: Impact on help seeking, mental health knowledge, and stigma in U.S. adolescents **Country**: United States **Funding**: Montana state legislative funding, Montana State University research funds **Bias**: two of the authors serve on the board of **YAM** and one author receives royalties from Guilford Press.	Inferred Cognitive Behavioral Theory	**Design:** Uncontrolled, pretest/post-test design **Purpose**: to determine the feasibility and acceptability of the school based mental health program, **YAM,** for adolescents in the United States.	**n=436** **Demographics:** Primarily 9th grade students. 51%female, 49% Caucasian, 32% Hispanic, 91% proficient in English **Setting**: 11 public or charter schools. 5 in Montana and 6 in Texas. **Exclusion**: consent not obtained **Attrition:** 76.8%	**IV1: YAM** **DV1: HSB** **DV2: MHL** **DV3: SA** **Definitions:** **YAM** consists of in class instruction. 5 50-minute sessions with supporting materials (3 role play sessions, two interactive lectures, information workbook, posters.	**Tools: GHSQ, RIBS** **Validity/ Reliability:** **GHSQ-*a*=**.70 **RIBS-*a*=**.72	**Statistical Tests Used:** Statistical software was used (SAS), McNemar's test, Cohen's D	**DV1**: increased post-test (*p*=.073) **DV2**: increased post-test (*p*=.100) **DV3:** increased (*p*=.001)	**Level of Evidence:** level 5 **Strengths**: report indicates that YAM is a promising intervention. **Weakness:** attrition rate is very high, no control group, study enrollment was low **Feasibility**: delivered by non-school personnel over 3-5 weeks, not the most feasible for schools to implement **Application: YAM** is a promising mental health promoting intervention for high schools in America, but more research needs to be done.

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice; Generalization
Campos, et al., (2018). Is it possible to "find space for mental health" in young people? Effectiveness of a school-based mental health literacy promotion program. **Country**: Portugal **Funding**: Portuguese Foundation for Science and Technology **Bias**: none	inferred Cognitive Behavioral Theory	**Design: RCT** **Purpose**: evaluate the effectiveness of a school-based intervention program focused on the promotion of **MHL.**	**N=** 543 **CG**=284 **EG**=259 **Demographics:** mean age= 13.04, majority male 52% **Setting**: 8 schools in Northern Portugal both private and public. **Exclusion**: school absence, switching schools **Attrition:** 28.8%	**IV1:** "Finding Space" program **DV1: MHL T2** (post-test) **DV2: MHL** T3(post-test) **Definitions:** "Finding Space" is a **MHL** program delivered in school by way of 2 90-minute sessions a week apart (group dynamics, music, videos).	**Tools: MHLq** (33 question Likert type scale where higher score =higher **MHL**) **Validity/ Reliability: MHLq-*a*=**.80	**Statistical Tests Used:** SPSS statistical analysis program Multivariate models-**GEE** Repeated and longitudinal measurements	**DV1**: significantly increased score on **MHLq** **DV2**: significantly increased score on **MHLq** *(p*=0.05)	**Level of Evidence:** Level 2 evidence, strong **Strengths**: randomized, large sample size **Weakness:** high attrition rate, socioeconomics was not considered **Feasibility**: feasible to replicate and apply to school setting, delivered by psychologist and not teachers **Application:** "Finding Space" seems to be a worthy intervention in schools to increase MHL.
Ng et al., (2020). A systematic	Guided by the PRISMA	**Design:** Qualitative	**N=14 studies n=695**	**IV: YMHFA** and **tMHFA**	The authors created a data	Narrative review,	Narrative review-	**Level of Evidence:**

Key: **ASQ-N**-Adolescent Stress Questionnaire, **ATE**-average treatment effect, ***a***-Cronbach's alpha, **CG**-control group**, CRT**-Cluster Randomized Trial, **CRXO**-cluster randomized crossover, ***ds***=effect sizes, **DS**- databases searched, **DSS**- depression stigma scale, ***d***=Cohen's measure, **EG**-experimental group, **GEE**- generalized estimating questions, **GHSQ**- General Help Seeking Questionnaire, **HSB**-help-seeking behavior, **K6**-K6 Psychological Distress scale, **LTS**- Likert type scale, **M**-mean, **MEM**- mixed effects model, **MEST**-short version of the Norwegian word for coping**, MHL**-mental health literacy, **MHLq**-Mental Health Literacy Questionnaire, **MHPK-10**-Mental Health Promoting Knowledge, **MWB**-mental well-being, ***p***=significance**, NFSB-** Non-fatal Suicidal Behavior**, PFA-**Physical First Aid **, PGSPS-**Perceived General Support from Parents Scale**, PMeHL**-positive mental health literacy, **PRISMA-**Preferred Reporting Items for Systematic Reviews and Meta-Analysis**, QCRCT**- quasi-cluster randomized control trial**, QEPPD-**Quasi-experimental pretest-posttest design**, RCT**-randomized control trial, **RIBS-**Reported and Intended Behavioral Scale**, SA-**stigmatizing attitudes, **SDS-**social distance scale**, SDQ-**strengths and difficulties questionnaire, **SP**-suicide plans, **SR**-systematic review, **SWEMWBS-**short Warwick-Edinburgh Mental Well-being scale**, T2-**comparison test, post-test**, tMHFA**-teen Mental Health First Aid, **WEMWBS**-Warwick-Edinburgh Mental Well-being Scale, **YAM**-Youth Aware of Mental Health, **YMHFA**-Youth Mental Health First Aid

Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice; Generalization
review of Youth and Teen Mental Health First Aid: Improving adolescent mental health **Country:** Singapore **Funding**: none **Bias**: none recognized	recommendations for systematic reviews, Inferred Cognitive Behavioral Theory	**SR,** Pre-posttest design with no control group studies, **CRT**s, and a **CRXO** **Purpose:** to provide an overview of the studies on YMHFA and tMHFA and the outcomes of this course regarding **MHL**, recognition of mental illness, **SA**, confidence, and helping intentions and behaviors.	**DS:** PubMed, Embase, PsycINFO, ERIC, Cochrane **Inclusion Criteria:** studies in English, primary intervention was YMHFA or tMHFA, all study designs	**DV1: MHL** **DV2**: recognition of mental illness **DV3: SA** **DV4:** confidence **DV5:** helping intentions	extraction sheet to look at **study design, participant characteristics, details of the training, and outcomes measured**	Guided by PRISMA	All studies showed both tMHFA and MHFA were generally effective in the domains of **MHL**, Recognition of mental illness, **SA**, and helping intentions. Each study was discussed and then all studies were summarized narratively.	Level 1 evidence **Strengths**: level of evidence, all studies using the same intervention **Weakness:** high attrition across all studies**,** only 14 studies included in review, no studies in non-western countries, high-risk populations **Feasibility/Application: YMHFA** and **tMHFA** are effective programs that could be integrated into school curriculum. Authors call for more research.
Breet et al., (2021). Systematic review and narrative	Inferred Cognitive Behavioral Theory, authors	**Design: SR** of RCTs, CRTs, open	**n=**43 **DS:** PubMed, Cochrane, CINAHL, DARE,	**IV:** 42 different interventions were reviewed to study impact the	Most studies used different tools to measure the dependent	Guided by PRISMA,	**DV1**: mixed results, most interventions	**Level of Evidence:** Level 1 evidence, strong.

Key: **ASQ-N**-Adolescent Stress Questionnaire, **ATE**-average treatment effect, ***a***-Cronbach's alpha, **CG**-control group**, CRT**-Cluster Randomized Trial, **CRXO**-cluster randomized crossover, ***ds***=effect sizes, **DS**- databases searched, **DSS**- depression stigma scale, ***d***=Cohen's measure, **EG**-experimental group, **GEE**- generalized estimating questions, **GHSQ**- General Help Seeking Questionnaire, **HSB**-help-seeking behavior, **K6**-K6 Psychological Distress scale, **LTS**- Likert type scale, **M**-mean, **MEM**- mixed effects model, **MEST-**short version of the Norwegian word for coping**, MHL**-mental health literacy, **MHLq**-Mental Health Literacy Questionnaire, **MHPK-10**-Mental Health Promoting Knowledge, **MWB**-mental well-being, ***p***=significance**, NFSB-** Non-fatal Suicidal Behavior**, PFA-**Physical First Aid **, PGSPS-**Perceived General Support from Parents Scale**, PMeHL**-positive mental health literacy, **PRISMA-**Preferred Reporting Items for Systematic Reviews and Meta-Analysis**, QCRCT**- quasi-cluster randomized control trial**, QEPPD-**Quasi-experimental pretest-posttest design**, RCT**-randomized control trial, **RIBS-**Reported and Intended Behavioral Scale**, SA-**stigmatizing attitudes, **SDS-**social distance scale**, SDQ-**strengths and difficulties questionnaire, **SP**-suicide plans, **SR**-systematic review, **SWEMWBS-**short Warwick-Edinburgh Mental Well-being scale**, T2-**comparison test, post-test**, tMHFA**-teen Mental Health First Aid, **WEMWBS**-Warwick-Edinburgh Mental Well-being Scale, **YAM**-Youth Aware of Mental Health, **YMHFA**-Youth Mental Health First Aid

Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice; Generalization
synthesis of suicide prevention in high-schools and universities: a research agenda for evidence-based practice. **Country: Africa** **Funding**: South African Medical Research Council **Bias**: none recognized	state using a "public health framework"	trials, and QEPPDs. **Purpose:** critically review the research methods in the existing high school and university programs for suicide prevention AND propose a research agenda for the future to advance EBP.	Africa-wide Info, IMSEAR, SciELO, EurasiaHealth **Inclusion Criteria:** 1.Peer-reviewed and English 2.intervention with before/after outcomes, 3. targeted any suicidal behavior, suicide knowledge, or stigma 4.targeted high school/university students 5.intervention delivered on campus	following variables **DV1: HSB** **DV2**: reducing **NFSB** **DV3: SA, MHL**	variables. The authors do not document them.	narrative review given	did not increase **HSB** **DV2**:3/11 studies significantly reduced **SP**, 4/11 sig reduced prevalence of suicide attempts **DV3**: all 4 interventions targeting stigma were found effective	**Strengths**: rigorous review process, targeted countries and databases not normally researched, broad. **Weakness:** quality of the majority of studies was compromised, small samples, moderate/high risk of bias of most studies **Application:** the study details many interventions in practice that aren't normally studies. Provides overview of effectiveness/ineffectiveness. Calls for more rigorous research to make EBP decisions.

Table A2

Evaluation Table for Qualitative Studies

Key: **ASQ-N**-Adolescent Stress Questionnaire, **ATE**-average treatment effect, ***a***-Cronbach's alpha, **CG**-control group**, CRT**-Cluster Randomized Trial, **CRXO**-cluster randomized crossover, ***ds***=effect sizes, **DS**- databases searched, **DSS**- depression stigma scale, ***d***=Cohen's measure, **EG**-experimental group, **GEE**- generalized estimating questions, **GHSQ**- General Help Seeking Questionnaire, **HSB**-help-seeking behavior, **K6**-K6 Psychological Distress scale, **LTS**- Likert type scale, **M**-mean, **MEM**- mixed effects model, **MEST**-short version of the Norwegian word for coping**, MHL**-mental health literacy, **MHLq**-Mental Health Literacy Questionnaire, **MHPK-10**-Mental Health Promoting Knowledge, **MWB**-mental well-being, ***p***=significance**, NFSB-** Non-fatal Suicidal Behavior**, PFA**-Physical First Aid **, PGSPS**-Perceived General Support from Parents Scale**, PMeHL**-positive mental health literacy, **PRISMA**-Preferred Reporting Items for Systematic Reviews and Meta-Analysis**, QCRCT**- quasi-cluster randomized control trial**, QEPPD**-Quasi-experimental pretest-posttest design**, RCT**-randomized control trial, **RIBS**-Reported and Intended Behavioral Scale**, SA**-stigmatizing attitudes, **SDS**-social distance scale**, SDQ**-strengths and difficulties questionnaire, **SP**-suicide plans, **SR**-systematic review, **SWEMWBS**-short Warwick-Edinburgh Mental Well-being scale**, T2**-comparison test, post-test**, tMHFA**-teen Mental Health First Aid, **WEMWBS**-Warwick-Edinburgh Mental Well-being Scale, **YAM**-Youth Aware of Mental Health, **YMHFA**-Youth Mental Health First Aid

Citation	Theory/ Conceptual Framework	Design/ Method/ Sampling	Sample/ Setting	Major Themes Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/ Quality of Evidence; Decision for/ Application to practice; Generalization
C.L. Johnson et al., (2020), Lessons learnt from the field: a qualitative evaluation of adolescent experiences of a universal mental health education program **Country:** Australia **Funding:** Mental health research grant **Bias:** 2 authors on the **YMHFA** board	Grounded Theory	**Design:** data gathered from previous CRXO, themes were collected from post training surveys **Method:** qualitative data were gathered from two post intervention questionnaires. 1.Immediate post training survey 2. 1 year post training survey. **Purpose:** to gather the opinions of students after receiving **tMHFA**	**Sample:** (n=979) **Demographics:** 10th grade students, M=15.82 years, female 43.94% **Setting:** classroom with online survey **Attrition:** 546	• RQ1-What do you think were the strengths of the program? • RQ2-What do you think were the weaknesses of the program? • RQ3-What would you do to make the program better? **Definitions:** asking for adolescent opinions on **tMHFA** program	**Data Collection:** online surveys **Data Dependability:** reliability values between 0.68 to 0.86	**State type used:** 1.General content analysis 2.Kappa analysis. 3.Thematic analysis.	**RQ1** 1.Connection with personal stories through visual media. 2. The relevance of the practical nature of the course. **RQ2** 1. Helping to promote **MHL** 2.weakness: student engagement. 5. student participation. **RQ3** 1.More hands on 2.Include student discussion and viewpoints.	**Level of Evidence:** Level 6 **Strengths:** large sample size, based on successful quantitative study **Weakness:** high attrition, only 4 schools in Australia surveyed, lower-level evidence **Feasibility:** easy to piggyback survey on with initial intervention. **Application:** applying these themes can help understand the **tMHFA MHL** program and improve it.

Key: **ASQ-N**-Adolescent Stress Questionnaire, **ATE**-average treatment effect, ***a***-Cronbach's alpha, **CG**-control group**, CRT**-Cluster Randomized Trial, **CRXO**-cluster randomized crossover, ***ds***=effect sizes, **DS**- databases searched, **DSS**- depression stigma scale, ***d***=Cohen's measure, **EG**-experimental group, **GEE**- generalized estimating questions, **GHSQ**- General Help Seeking Questionnaire, **HSB**-help-seeking behavior, **K6**-K6 Psychological Distress scale, **LTS**- Likert type scale, **M**-mean, **MEM**- mixed effects model, **MEST**-short version of the Norwegian word for coping**, MHL**-mental health literacy, **MHLq**-Mental Health Literacy Questionnaire, **MHPK-10**-Mental Health Promoting Knowledge, **MWB**-mental well-being, ***p***=significance**, NFSB-** Non-fatal Suicidal Behavior**, PFA-**Physical First Aid **, PGSPS-**Perceived General Support from Parents Scale**, PMeHL**-positive mental health literacy, **PRISMA-**Preferred Reporting Items for Systematic Reviews and Meta-Analysis**, QCRCT**- quasi-cluster randomized control trial**, QEPPD-**Quasi-experimental pretest-posttest design**, RCT**-randomized control trial, **RIBS-**Reported and Intended Behavioral Scale**, SA-**stigmatizing attitudes, **SDS-**social distance scale**, SDQ-**strengths and difficulties questionnaire, **SP**-suicide plans, **SR**-systematic review, **SWEMWBS-**short Warwick-Edinburgh Mental Well-being scale**, T2-**comparison test, post-test**, tMHFA**-teen Mental Health First Aid, **WEMWBS**-Warwick-Edinburgh Mental Well-being Scale, **YAM**-Youth Aware of Mental Health, **YMHFA**-Youth Mental Health First Aid

Table A3

Synthesis Table

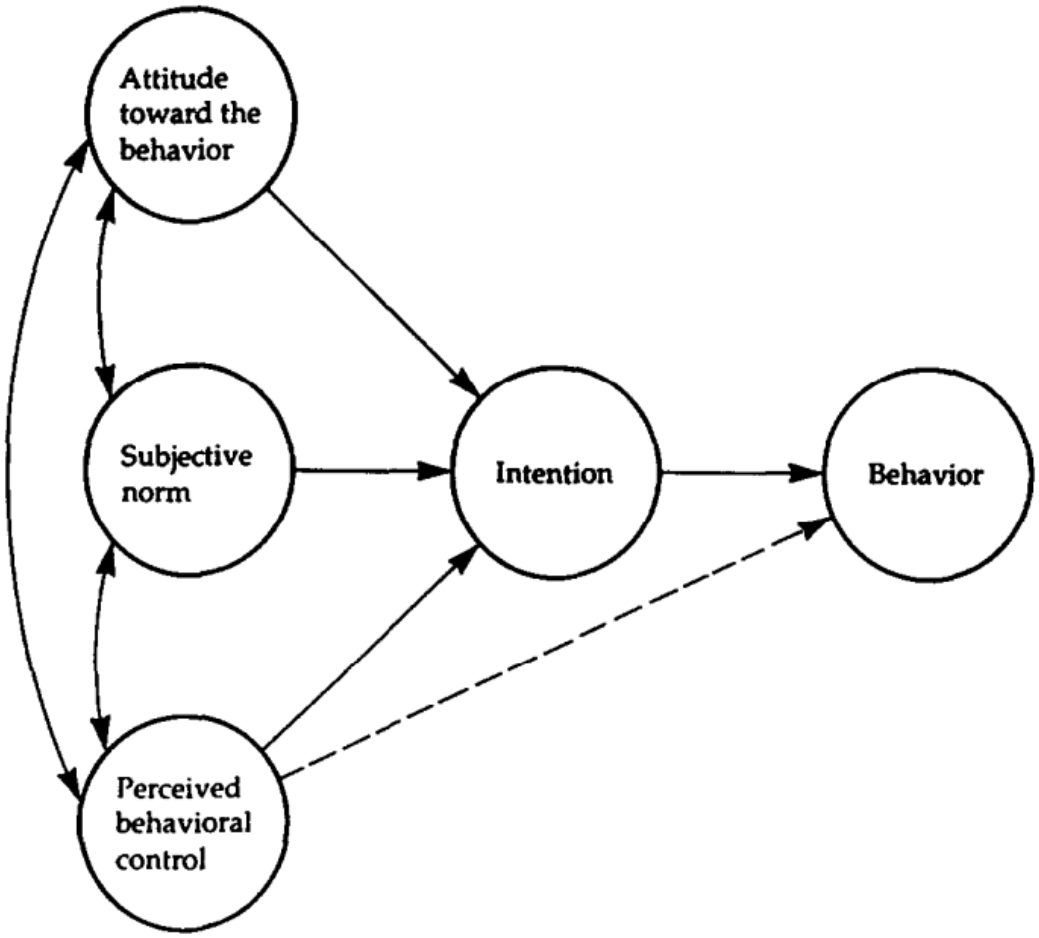
Study (Author, year)	Hart et al., (2018)	Morgado et al., (2021)	Johnson et al., (2021)	Bjornsen et al., (2019)	Morgan et al., (2020)	Bjornsen et al., (2018)	Lindow et al., (2020)	Campos et al., (2018)	Ng et al., (2021)	Breet et al., (2021)
Design	CRXO	RCT	QUAL	XSC	RCT	CA	UPP	RCT	SR	SR
LOE	2	2	6	4	2	5	5	2	1	1
Sample										
n subjects	1942	54	979	1888	267	357	436	543	14	43
M-Age	16	14.5	15.82	17.02	16.5	17.6	14.5	13.04	NR	NR
HA (greater than 25%)	x	x	x	x	x	x	x	x	n/a	n/a
Setting										
Implemented in school	x	x	x	x	x	x	x	x	x	x
Interventions										
YMHFA/ tMHFA	x		x		x				x	x
ProLisMental		x								
MEST						x				
YAM							x			x
Finding Space								x		
Tools Used										
K6, ASQ-N	x			x	x					
DSS/SDS	x				x					
QuALisMental		x								
SDQ, WEMWBS				x	x	x				
PGSPS					x					
GHSQ/ RIBS							x			
MHPK-10, MHLq				x		x		x		
Outcomes/ Themes										
MHL	↑	↑		↑	↑	↑	↑	↑	↑	MR
HSB	↑	NR			↑		↑	↑	↑	MR
SA	↓	↑			↓		↓	↓	↓	MR
User satisfaction			↑							

Key: **ASQ-N**-Adolescent Stress Questionnaire**, CA**-Cohort Analysis, **CXRO**-Cluster Randomized Crossover Trial, **DSS**- depression stigma scale**, GHSQ**- General Help Seeking Questionnaire, **HSB-**Help Seeking Behaviors**, K6-**K6 Psychological Distress Scale**, LOE**-Level of Evidence, **M-Age** Mean Age, **MEST**-short version of the Norwegian word for coping, **MHL**-Mental Health Literacy, **MHLq**-Mental Health Literacy Questionnaire, **MHPK-10**-Mental Health Promoting Knowledge, **MR**-mixed results, **NR**-Not Recorded, **PGSPS-**Perceived General Support from Parents Scale**, RCT**-Randomized Control Trial, **RIBS-**Reported and Intended Behavioral Scale**, SA**-Stigmatizing Attitudes, **SDS-**social distance scale**, SDQ-**strengths and difficulties questionnaire, **tMHFA**-teen Mental Health Forst Aid, **UPP-**Uncontrolled Pre-test/Post-test Design, **XSC**-Cross Sectional Cohort, **YAM**-Youth Aware of Mental Health, **YMHFA**-Youth Mental Health First Aid.

Appendix B

Models and Frameworks

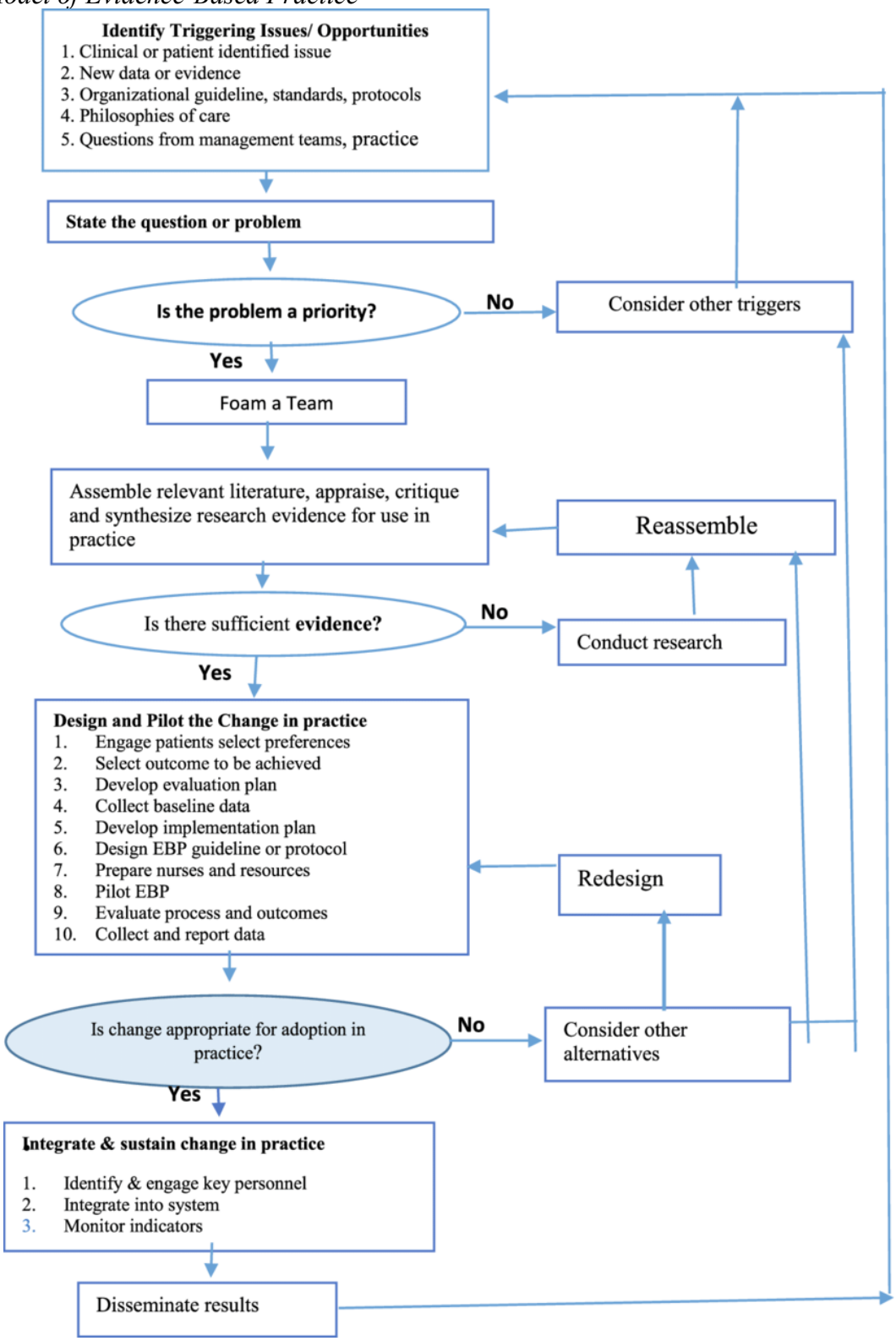
Figure B1
Theory of Planned Behavior



(Ajzen, 1991)

Figure B2

Iowa Model of Evidence-Based Practice



(Titler, 2001)

Appendix C
Budget

Phase	Activities	Cost	subtotal	Total
Preparation	tMHFA* train the trainer course (online Sept 7,8,9) paid for by ASU student	$1700		$1700
	tMHFA train the trainer (online Sept 7, 8, 9) paid for by CUSD for its four employees	4 x 1700	6,800	$6,800
	CUSD* will purchase the tMHFA bundle, including teacher and student manuals	$50,000		$50,000
	Purchasing 280 tMHFA* water bottle stickers	$150		$150
	Printing parental consent forms as well as student assent forms	$50		$50
Delivery	Print 300 pre-test surveys for students to fill out by hand	$75		$75
	Indirect cost-paid working time of 3 social workers during the duration of education	3 x $1500	4,500	$4,500
Evaluation	Print 300 Post-test surveys for students to fill out by hand	$75		$75
	Hiring statistical aid in converting pre-test/post-test scores	$500		$500
			TOTAL:	**63,850**

**tMHFA-teen Mental Health First Aid, CUSD-Chandler Unified School District*

Appendix D

MHLq – Mental health literacy questionnaire – young people

Campos, L., Dias, P., Palha, F., Duarte, A., & Veiga, E. (2016)

Date: _____/_____/_____ Last 4 digits of your phone number ____ ____ ____ ____

The purpose of this questionnaire is to better understand what people of your age think about mental health issues.

The questions involve aspects like what have you heard and what do you think about this kind of problems, where should people go to get help, how can these problems be treated, and other aspects.

If you don't want to answer to any question, don't answer.

1. What's your birth date? ___ / ___ / _____

2. Are you a boy? ☐ or Are you a girl? ☐

3. What grade are you in school? □ 9th □ 10th □ 11th

4. Which city do you live in? _____

5. What's the job of your parent/guardian in charge of your education?

_____

5.1 Currently, is your parent/guardian working? ☐ Yes ☐ No

6. Do you know anyone who has or had a mental health problem? ☐ Yes ☐ No ☐ I don't know

6.1 If you answered yes, which mental health problem? _____

6.2 What is your relationship with that person (tick an option below)?

☐ Family member

☐ Friend

☐ Myself

☐ Another _____

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Campos, L., Dias, P., Palha, F., Duarte, A., & Veiga, E. (2016). Development and psychometric properties of a new questionnaire for assessing Mental Health Literacy in young people. *Universitas Psychologica, 15*(2), 61-72. DOI: 10.111 44/Javeriana.upsy15-2.dppq

You will now find several statements with which you may, or may not, agree.

For each statement, please tick the option that indicates how much you agree or disagree.

Here you have one example of someone who strongly agrees with the statement:

Young people who do sports on a regular basis are healthier.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
				X

1. If a friend of mine developed a mental disorder, I would offer her/him support.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

2. Physical exercise helps to improve mental health.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

3. A person with depression feels very miserable.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

4. People with schizophrenia usually have delusions (e.g., they may believe they are constantly being followed and observed).

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

5. If I had a mental disorder I would seek my family's help.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

6. If a friend of mine developed a mental disorder, I would encourage her/him to look for a psychologist.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

7. Mental disorders don't affect people's behaviours.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

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8. If a friend of mine developed a mental disorder, I would talk to her/his parents.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

9. Good sleep helps to improve mental health.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

10. If I had a mental disorder I would seek for professional help (psychologist and /or psychiatrist).

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

11. A person with anxiety disorder may panic in situations that she/he fears.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

12. People with mental disorders come from families with little money.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

13. If a friend of mine developed a mental disorder, I would listen to her/him without judging or criticising.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

14. Alcohol use may cause mental disorders.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

15. Mental disorders don't affect people's feelings.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

16. The sooner mental disorders are identified and treated, the better.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

17. Only adults have mental disorders.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

18. Brain malfunctioning may cause the development of mental disorders.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

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19. If a friend of mine developed a mental disorder, I would encourage her/him to get medical support.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

20. If I had a mental disorder I would seek my friends' help.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

21. Having a balanced diet helps to improve mental health.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

22. One of the symptoms of depression is the loss of interest or pleasure in most things.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

23. A person with anxiety disorder avoids situations that may cause her/him distress.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

24. If a friend of mine developed a mental disorder, I wouldn't be able to help her/him.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

25. The symptoms' length is one of the important aspects to determine whether a person has, or has not, a mental disorder.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

26. Depression is not a true mental disorder.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

27. Drug addiction may cause mental disorders.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

28. Mental disorders affect people's thoughts.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

29. If a friend of mine developed a mental disorder, I would talk to the form teacher or other teacher.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

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30. Doing something enjoyable helps to improve mental health.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

31. A person with schizophrenia may see and hear things that nobody else sees and hears.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

32. Talking over problems with someone helps to improve mental health.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

33. Highly stressful situations may cause mental disorders.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

34. From the following list, please tick which problems you think are mental health problems (you may choose more than one):

Generalized anxiety	☐	Depression	☐
Cerebral palsy	☐	Stroke	☐
Trisomy 21	☐	Schizophrenia	☐
Parkinson	☐		

Did you like the program, teen Mental Health First Aid? Yes _____ No _____ Not sure_____

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