

### **Initial Knowledge Synthesis**

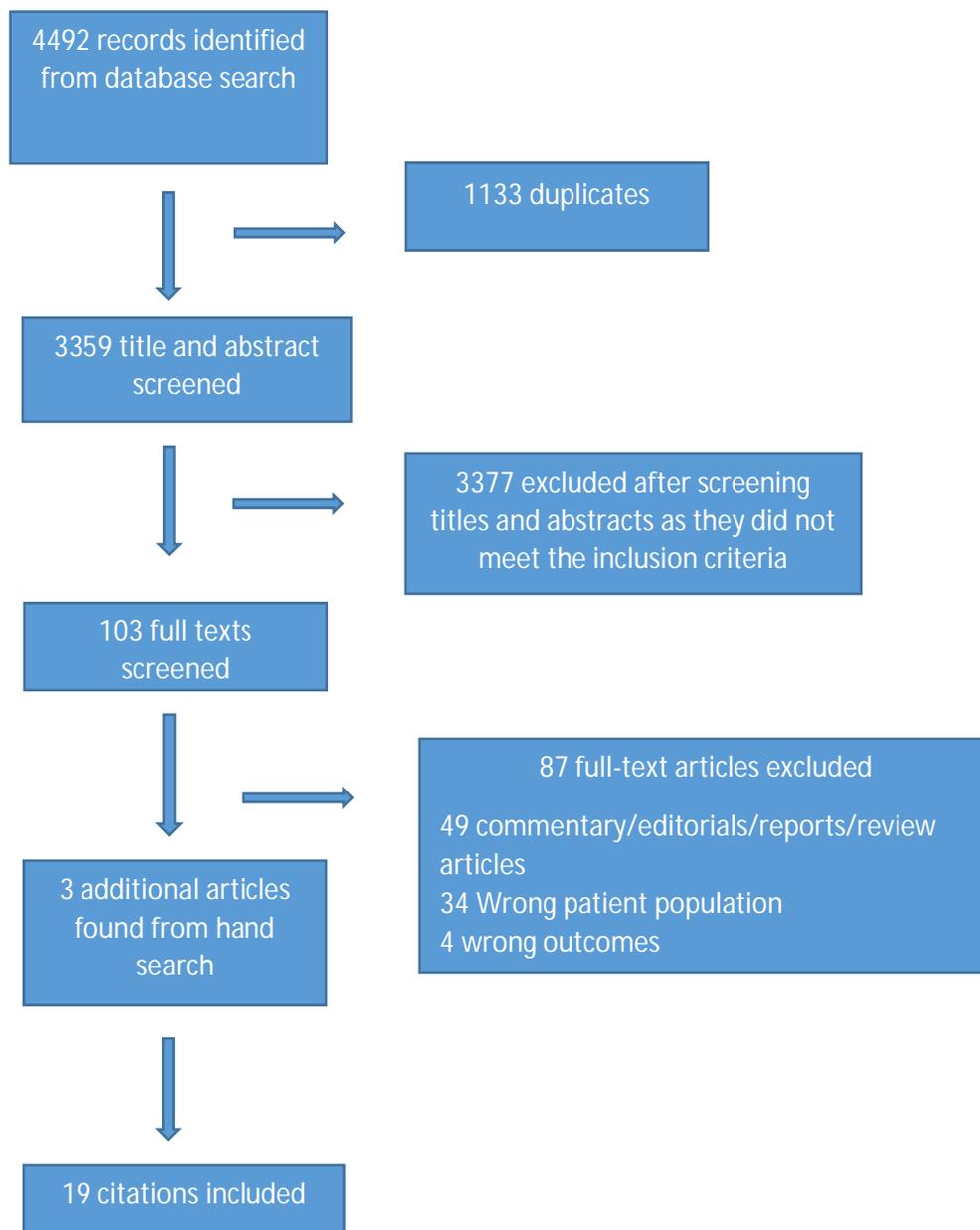
We did an initial knowledge synthesis on mental health and substance use among children and adolescents amidst COVID-19. We searched, MEDLINE, EMBASE, Web of Science Index Medicus, CINAHL, Lilacs, CENTRAL (Cochrane Library), eLENA (WHO), and WHO COVID-19 databases. We also searched for non-indexed database including Google Scholar and pre-print databases. The search identified 4492 articles; 1133 duplicates were removed, leaving 3359 unique citations. Most of the studies found through the systematic search included articles with population 18 years and above. Articles were excluded based on title/abstract screening (n=3268); 87 full-text articles were retrieved; 13 met the inclusion criteria. An additional three papers were identified by bibliographic search of included papers that made a total of 16 papers. These studies were conducted globally during four different pandemic/epidemic period i.e., Ebola, Equine Influenza, H1N1, and COVID-19. Most of the studies were cross sectional (n=15), two were interventional studies (n=2), one each was qualitative, and mixed method studies. The population age range varies between 5-19 years inducing both boys and girls. The outcome reported in included studies were anxiety, depression, mental health issues, fear, stigma, Post Traumatic Stress Disorder, grief, stress, worry, helplessness, low self-esteem, and social/risky behavior problems (for e.g. substance abuse, suicide, relationships, academic issues, absenteeism from work, etc.). The association of study outcomes was compared against several demographic factors such as age, gender, educational level, financial status, employment status etc. The review did not perform meta-analysis because of various heterogeneity in the papers such as study design, type of pandemic, age groups of participants, and outcomes reported. We synthesized our findings based on the type of pandemic, outcomes reported, and type of study designs.

Mental health problems are common among children and adolescents however, very few studies have evaluated the impact of pandemics or crises on children and adolescent's mental health. The majority of the intervention-based studies were conducted on population 18 years and above. The initial synthesis identified that mental health issues among children and adolescents can accelerate during the pandemic. Therefore, it is important that parents, teachers, community health workers, and public agencies should be informed and receive formal training to facilitate the early identification of children's psychological problems, recognize the early sign and symptoms indicating further intervention or referral, and standardize the use of rapid

screening tools for mental health. Additionally, mental health professionals should use existing evidence-based guidelines and also establish easy operational strategies to cope with COVID-19 pandemic-related mental health problems in children and adolescents. We also believe that children's access to mental health services should be improved. Moreover, the post-pandemic surveillance of mental disorders and a longitudinal study among the children and adolescent population should be considered.

**Update:** During the last two months, we run a repeated search of the additional articles with the help of librarian. We screened 863 articles by title and abstracts. Full text screening of 16 more articles was done and we added 3 additional articles in the review. The 3 more studies are related to COVID 19 that included the children and adolescent's population. The outcomes observed in the studies are anxiety and depression symptoms, coping mechanism, psychological problems, PTSD, stress, loneliness, and depression. The revised Prisma diagram and systematic review table has been added as an attachment.

**Figure 1: PRISMA**



S #	Author and year	Country	Study Design	Target Population	Total Participants	Exposure	Intervention	Outcomes
1	Buzzi, 2020	Italy	Cross sectional - Online survey	13-19 years girls and boys	2064 adolescents	COVID-19	N/A	Consequences on psycho-social well-being
2	Decosimo, 2019	Liberia, West Africa	Pre and Post design	3-18 years	870 children	Ebola epidemic	PTL/RESH  Playing to live intervention include arts program, support services, trained community facility, and cultural adaptation and community engagement program  Renewed energy serving humanity program including  Art therapy, play therapy, yoga therapy, and child life	Traumatic stress symptoms  Psychological stress  Risky behaviors  Mental health  Self esteem  Communication skills  Self-understanding  Academic progress  Coping skills  Relationship skills  Concept of safety  Emotional regulation  Stress relief
3	Denis-Ramirez, 2017	Sierra Leone, West Africa	Qualitative study - Draw-and-write method	8-14 years	24 children	Ebola virus	N/A	Fear  Stigma
4	Chen 2020	Guiyang, China	Cross sectional - Online survey	6-15 years	1036 Children Male 531	COVID-19	N/A	Depression  Anxiety

					Female 505			
5	Kamara, 2017	Sierra Leone, West Africa	Prospective	0-17 years	27 children	Ebola virus	A nurse-led mental health and psychosocial support service via provision of  Psychotropic medication, Psychological intervention, and Social intervention	Depression Anxiety Grief Social problems
6	Liang, 2020	China	Cross-Sectional	14-20 years	130 youth	COVID-19	N/A	PTSD Coping styles Mental health
7	Liu, 2020	Sichuan, China	Cross-sectional  observational study	10-12 years  5 - 6 grade	209 primary school students  Girls 93 Boys 116	COVID-19	N/A	Psychosomatic symptoms Psychological distress
8	Oosterhoff, 2020	United States	Cross sectional - Online survey	13 -18 years	683 adolescents	COVID-19	N/A	Anxiety symptoms Depressive symptoms burdensomeness belongingness
9	Saurabh, 2020	India	Cross sectional – survey questionnaire	9-18 years	252 children and adolescents	COVID-19	N/A	Worry Helplessness Fear

10	Taylor, 2008	Australia	Cross sectional – online survey	Under 16 years: 36 children 16-24 years: 224 participants	260 participants	Equine influenza	N/A	Psychological distress
11	Tian, 2020	China	Cross-sectional observational study	Children under 18 years	22 participants	COVID-19	N/A	Psychological symptoms
12	Zhou, 2020	China	Cross-sectional – online survey	12-18 years	8079 participants	COVID-19	N/A	Depression Anxiety
13	Wang, 2020	China	Cross-sectional survey design	12-21.4 years	344 participants	COVID-19	N/A	Stress Anxiety Depression
14	Liu, 2020	China	Cross-sectional survey design	Below 18 years	34 participants	COVID-19	N/A	Anxiety Depression Psychological abnormalities
15	Sprang, 2013	United States, Canada	Mixed-method approach survey, focus groups, and interviews	Children	586 Participants	H1N1	N/A	PTSD

16	Xie, 2020	Hubei, China	Cross-sectional survey design	Children grade 2-6	1784 Students	COVID-19	N/A	Anxiety Symptoms Depressive symptoms
17	Duan, 2020	China	Cross-sectional survey design	7 to 18 year	3613 students  1812 males 1801 females	COVID-19	N/A	Anxiety Symptoms Depressive symptoms Coping mechanism
18	Linag, 2020	China	Cross-sectional survey design	14-20 years	130 Participants	COVID-19	N/A	Psychological problem PTSD Negative coping
19	Ellis, 2020	Ontario, Canada	Cross-sectional survey design	14-18 years	1054 Participants	COVID-19	N/A	Stress Loneliness Depression