

Table 3: Qualitative synthesis of studies included in the systematic review

First author and year of publication	Study characteristics (country, setting, design, period)	Sampling method and Sample size (overall, for male and/or female)	Participants' characteristics (age being in years)	Mental health issues assessed, with tools and cut-off used	Frequencies of mental health issues assessed in the study	Reported factors of mental health issues assessed
Abas et al. 2021	Sudan, 21 universities, online cross-sectional study, May 2020 (during the 1 st COVID-19 wave)	Probabilistic (Stratified random sampling), total sample size of 478 (344 males and 134 females)	Unspecified specialties, mean age of 21.6 ± 2.8 , upper extreme of 39 and lower one not reported	Anxiety. Beck Anxiety Inventory / BAI. Scores of 0–21 = low anxiety; 22–35 = moderate anxiety; ≥ 36 = potentially concerning level of anxiety	Of the study sample, 75.1% had low anxiety, 15.5% had moderate anxiety and 9.4% had potentially concerning level of anxiety	Not complying with the curfew measures, and the preventive etiquette of covering mouth while coughing or sneezing were associated with potentially concerning levels of anxiety while experiencing fever, sore throat and myalgia were associated with moderate anxiety
Awoke et al. 2021	Ethiopia, one university, cross-sectional email-based survey, August to September 5, 2020	Non probabilistic (combination of purposive and snowball sampling techniques), total sample size of 337 (174 males and 163 females)	Health science students, mean age of 22.8 ± 1.8 , age range not reported	Stress. Perceived stress scale (PSS)-10. Scores ≥ 25 = high perceived stress, and scores < 25 = low perceived stress	Of the study sample, 35.9% reported high perceived stress levels while 64.1% reported low perceived stress	Personal perception of being stressed by the daily number of COVID-19 cases/deaths in Ethiopia, rare online talk/chat with friends, confusion due to the inconsistent strategies developed by health/government authorities, perception of self/family members being at risk of getting sick, decreased household income following the COVID-19 pandemic
Aylie et al. 2020	Ethiopia, more than one university, community based cross-sectional study (phone calls), May 15 to June 15, 2020	Probabilistic (Systematic sampling technique), total sample size of 314 (199 males and 115 females)	Unspecified specialties, 22.8 ± 2.8 , lower extreme of 18 years, upper extreme not reported	Depression, anxiety, stress (DAS). DAS Scale (DASS) with subscales for depression, anxiety, stress, and respective cut-offs of ≥ 10 , ≥ 08 and ≥ 15	Of the study sample, 21.3% had depression, 27.1% had anxiety and 32.5% had stress	For depression: being female, staying at home, history of medical illness, and poor and moderate social support For anxiety: not living with their parents, relatives got coronavirus and low family income For stress: substance use, depression, anxiety, and poor social support
Davis et al. 2021	Liberia, one university, cross-sectional email-based survey, July 1 to October 30, 2020	Non probabilistic (Purposive sampling), total sample size of 103 (63 males and 40 females)	Pharmacy and medical students, median age of 29 [interquartile range of 26.3], age ≥ 18 , no range reported	Depression. Patient Health Questionnaire with 8 items (PHQ-8). Positive depression screening if ≥ 10	Of the study sample, 19.4% had a positive depression screen	Concerns about the health of household members, household finances, and sharing a house with more people

Elhadi et al. 2021	Libya, 15 medical schools, cross-sectional study (online and paper versions), April 20 to May 1, 2020	Non probabilistic, total sample size of 2,430 (511 males and 1,919 females)	Medical students, mean age of 23.3 ± 2.6 , age range not reported	Anxiety, depression, suicidal ideas. Generalized Anxiety Disorder 7-item (GAD-7) scale with score ≥ 15 = severe anxiety, Patient Health Questionnaire (PHQ-9) with score ≥ 15 = moderately severe to severe depression	Of the study sample, 11% had severe anxiety, 21.6% had moderately severe to severe depression (9.7% severe) and 22.7% had suicidal ideations (14.1% several days, 3.7% more than half of the days and 4.9% every day)	For anxiety (severe): living status (Students living alone had a higher prevalence of anxiety) and internal displacement For depression (moderately severe to severe): medical students in higher years of study had a higher prevalence of depressive symptoms compared to those in earlier years
El-Monshed et al. 2021	Egypt, one university, online cross-sectional survey, May 30 to June 6, 2020	Non probabilistic (convenience sampling), total sample size of 612 (234 males and 378 females)	Unspecified specialties, median age of 20, age range of 18 – 25	Depression, anxiety, stress. Depression Anxiety Stress Scale (DASS-21) with subscales for depression, anxiety, stress, and respective cut-offs of ≥ 10 , ≥ 08 and ≥ 15	Of the study sample, 74.5% had depression (26.7% at least severe), 47.1% had anxiety (21.6% at least severe) and 40.5% suffered from stress (12.9% at least severe)	No associated or risk factors assessed
Essangri et al. 2021	Morocco, seven faculties of medicine, online cross-sectional survey, April 8 to 18, 2020 (early outbreak's stage)	Probabilistic, total sample size of 549 (143 males and 406 females)	Medical students, mean age of 22 ± 3 , no age range reported	Depression, anxiety, psychological distress. Respective tools: PHQ-9, GAD-7, Kessler distress scale (K-6). Respective cut-off scores: 05 (mild), 05 (mild) and 13	Of the study sample, 74.6% had depression (24.2% severe), 62.3% had anxiety (9.8% severe) and 69% had nonspecific psychological distress	For depression: female gender, preclinical level of enrollment, living in high COVID-19 prevalence locations For anxiety: female gender, living in high COVID-19 prevalence locations For nonspecific psychological distress: female gender, preclinical level of study
Ghazawy et al. 2020	Egypt, 20 universities, online cross-sectional survey, first week of May 2020 (lockdown period)	Non probabilistic (snowball sampling), total sample size of 1335 (510 males and 825 females)	Unspecified specialties, no mean/median age or age range reported	Depression, anxiety, stress. Depression Anxiety Stress Scale (DASS-21) with subscales for depression, anxiety, stress, and respective cut-offs of ≥ 10 , ≥ 08 and ≥ 15	Of the study sample, 70.5% had depression (9.7% severe/extremely severe), 53.6% suffered from anxiety (15.3% severe/extremely severe), 47.8% suffered from stress (14.2% severe/extremely severe)	For depression or anxiety or stress: Female gender, relative or acquaintance infected with COVID-19, chronic health problem, lack of psychological family support For depression alone: medical studies For anxiety alone: more time spent to follow updates about the COVID-19
Mekonen et al. 2021	Ethiopia, one university, cross-sectional study,	Probabilistic (simple random sampling), total sample size of	Graduating class students of unspecified specialties, mean	Depression, anxiety, stress. Depression Anxiety Stress Scale (DASS-21) with subscales for depression,	Of the study sample, 40.2% had depression, 39.6% suffered from anxiety, 22.2% suffered from stress	For depression: urban area, family life, non-health related studies, confirmed cases in the family, no physical exercise

	November 10 to 30, 2020	338 (190 males and 148 females)	age of 24.7 ± 2.8 , no age range reported	anxiety, stress, and respective cut-offs of ≥ 10 , ≥ 08 and ≥ 15		For anxiety: urban area, substance use, sedentary habit, fear of infecting family For stress: urban area, family life, sedentary lifestyle, unable to practice COVID-19 preventive measures, contact history
Rahali et al. 2020	Morocco, one university, transversal study (email), March 17 to April 30, 2020	No details regarding sampling technique used, total sample size of 123 (57 males and 66 females)	Unspecified specialties, mean age of 21, no age range reported	Stress. Perceived stress scale (PSS)-10. No cut-off reported in the study article	Of the study sample, 49% had a pathological perceived stress	No associated or risk factors assessed
Saguem et al. 2021	Tunisia, one university, online cross-sectional study, April 11 to May 3, 2020 (at one month of confinement)	Non probabilistic, total sample size of 251 (44 males and 207 females)	Undergraduate medical students, median age of 21, age range of 18 – 31	Depression, anxiety, stress. Depression Anxiety Stress Scale (DASS-21) with subscales for depression, anxiety, stress, and respective cut-offs of ≥ 10 , ≥ 08 and ≥ 15	Of the study sample, 67.7% had depression (31.5% at least severe), 55.8% suffered from anxiety (29.9% at least severe), 44.6% suffered from stress (17.5% at least severe)	No associated or risk factors assessed
Simegn et al. 2021	Ethiopia, more than one university, online cross-sectional survey, June 30 to July 30, 2020 (early stage of COVID-19 pandemic)	Non probabilistic, total sample size of 423 (272 males and 151 females)	Health related students and none health related ones, mean age of 22.9, age range of 18 – 34	Depression, anxiety, stress. Depression Anxiety Stress Scale (DASS-21) with subscales for depression, anxiety, stress, and respective cut-offs of ≥ 10 , ≥ 08 and ≥ 15	Of the study sample, 46.3% had depression (16.8% at least severe), 52% suffered from anxiety (26.2% at least severe), 26.8% suffered from stress (12.8% at least severe)	For depression: female gender, poor self-efficacy to prevent COVID-19, no reading of material about COVID-19 prevention, lack to access to reading materials about their profession, lack of access to uninterrupted internet access For anxiety: female gender, lower ages, non-health-related studies, thought that COVID-19 is not preventable, no reading of material about COVID-19 prevention For stress: female gender, 1 st and 2 nd year of study, thought that COVID-19 is not preventable, presence of COVID-19 patient at the town they are living in, lack of access to uninterrupted internet access