**Psychological distress and unhealthy dietary behaviours among adolescents aged 12-15 years in nine South-East Asian countries: a secondary analysis of the Global School-Based Health Survey data**

**Supplementary materials**

**Table S1: Variable definitions**

|  |  |  |
| --- | --- | --- |
| **Variables**  | **Survey question** | **Response options and recording**  |
| **Psychological distress variables**  |
| Anxiety  | During the past 12 months, how often have you been so worried about something that you could not sleep at night? | No = “never” or “rarely” or “sometimes”Yes = “most of the times” or “always” |
| Loneliness  | During the past 12 months, how often have you felt lonely? | No = “never” or “rarely” or “sometimes”Yes = “most of the times” or “always” |
| Suicide ideation  | During the past 12 months, did you ever seriously consider attempting suicide? | No Yes  |
| Suicide planning  | During the past 12 months, did you make a plan about how you would attempt suicide? | No Yes |
| Suicide attempt  | During the past 12 months, how many times did you actually attempt suicide? | No = 0 timeYes = 1, 2 or 3, 4 or 5, 6 or more times |
| Psychological distress  |  | No = Presence of less than two out of five psychological variables Yes = Presence of two or more out of five psychological variables |
| **Unhealthy dietary behaviours**  |
| Fruit consumption  | During the past 30 days, how many times per day did you **usually** eat fruit, such as COUNTRY SPECIFIC EXAMPLES? | Inadequate = I did not eat fruit during the past 30 days or Less than one time per dayAdequate = 1 time per day, 2 times per day,3 times per day, 4 times per day, or 5 or more times per day |
| Vegetable consumption  | During the past 30 days, how many times per day did you **usually** eat fruit, such as COUNTRY SPECIFIC EXAMPLES? | Inadequate = I did not eat fruit during the past 30 days or Less than one time per dayAdequate = 1 time per day, 2 times per day,3 times per day, 4 times per day, or 5 or more times per day |
| Soft drink consumption  | During the past 30 days, how many times per day did you **usually** drink carbonated soft drinks, such as COUNTRY SPECIFIC EXAMPLES? (Do **not** include diet soft drinks.) | Daily = 1 time per day, 2 times per day, 3 times per day, 4 times per day, or 5 or more times per dayLess than daily = I did not drink carbonated soft drinks during the past 30 days or Less than 1 time per day |
| Fast food consumption  | During the past 7 days, on how many days did you eat food from a fast food restaurant, such as COUNTRY SPECIFIC EXAMPLES? | Less than weekly = 0 days Weekly = 1 day, 2 days, 3 days, 4 days, 5 days, 6 days, or 7 days |
|  |  |  |
| **Covariates**  |  |  |
| Age  | How old are you?  |  |
| Sex  | What is your sex? |  |
| Socioeconomic status (huger as proxy)  | During the past 30 days, how often did you go hungry because there was not enough food in your home? | Average = “never” or “rarely” or “sometimes” Below average = “most of the times” or “always”  |
| Bullied  | During the past 30 days, on how many days were you bullied? | No = 0 days Yes = “1 or 2 days” or “3 to 5 days” or “6 to 9 days” or “10 to 19 days” or “20 to 29 days” or “All 30 days”  |
| Parental support  | During the past 30 days, how often did your parents or guardians understand your problems and worries? | No = “never” or “rarely” or “sometimes”Yes = “most of the times” or “always” |
| Peer support  | During the past 30 days, how often were most of the students in your school kind and helpful? | No = “never” or “rarely” or “sometimes”Yes = “most of the times” or “always” |
| Close friend  | How many close friends do you have? | No = 0 Yes = 1, 2, 3 or more  |
| Smoking  | During the past 30 days, on how many days did you smoke cigarettes? | No = “0 days” Yes = “1 or 2 days” or “3 to 5 days” or ‘”6 to 9 days” or “10 to 19 days” or “20 to 29 days” or “All 30 days”  |
| Physical activity  | During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? ADD UP ALL THE TIME YOU SPENT IN ANY KIND OF PHYSICAL ACTIVITY EACH DAY. | No = “0 days” Yes = “1 day” or “2 days” or “3 days” or “4 days” or “5 days” or “6 days” or “7 days”  |
| Overweight  |  | Body mass index (BMI) is >+1SD from the median for age and sex, according to the WHO Growth Reference Data |

More details about GSHS questionnaires can be found at: <https://www.who.int/ncds/surveillance/gshs/methodology/en/>

|  |
| --- |
| **Table S2: Prevalence of individual psychological distress items among adolescents aged 12-15 years, pooled and by country** |
| **Country** | **Prevalence (95% CI)\*** |
|  | **Boys** | **Girls** | **Total** |
| **Loneliness** |
| Bangladesh | 11.1 (9.2-13.2) | 9.0 (7.7-10.5) | 10.3 (9.2-11.5) |
| Bhutan | 8.0 (6.6-9.6) | 14.0 (12.4-15.6) | 11.3 (10.2-12.4) |
| Indonesia | 4.5 (3.8-5.2) | 6.7 (6.0-7.4) | 5.6 (5.1-6.1) |
| Maldives | 10.5 (8.2-13.1) | 19.6 (17.2-22.3) | 15.2 (13.5-17.1) |
| Myanmar | 6.1 (4.7-7.7) | 9.8 (8.2-11.6) | 8.1 (6.9-9.3) |
| Nepal | 5.1 (4.2-6.2) | 5.3 (4.4-6.2) | 5.2 (4.5-5.9) |
| Sri Lanka | 6.6 (5.1-8.4) | 7.4 (6.0-9.0) | 7.0 (6.0-8.2) |
| Thailand | 9.2 (7.8-10.7) | 7.9 (6.8-9.2) | 8.5 (7.6-9.4) |
| Timor-Leste | 12.3 (9.8-15.2) | 10.0 (8.0-12.2) | 11.1 (9.5-12.8) |
| *Pooled estimate* | *8.0 (6.3-9.7)* | *9.8 (7.7-11.9)* | *9.1 (7.3-10.9)* |
| **Anxiety** |
| Bangladesh | 3.3 (2.3-4.6) | 4.5 (3.5-5.6) | 3.8 (3.1-4.6) |
| Bhutan | 5.7 (4.5-7.0) | 7.8 (6.6-9.1) | 6.8 (5.9-7.7) |
| Indonesia | 4.1 (3.5-4.7) | 3.9 (3.3-4.5) | 4.0 (3.6-4.4) |
| Maldives | 10.1 (7.9-12.8) | 17.6 (15.3-20.2) | 14.0 (12.4-15.9) |
| Myanmar | 3.3 (2.3-4.7) | 3.7 (2.7-5.0) | 3.5 (2.8-4.4) |
| Nepal | 3.3 (2.5-4.1) | 3.4 (2.7-4.2) | 3.3 (2.8-3.9) |
| Sri Lanka | 3.4 (2.3-4.8) | 3.8 (2.8-5.0) | 3.6 (2.8-4.4) |
| Thailand | 6.1 (5.0-7.3) | 7.4 (6.3-8.6) | 6.8 (6.0-7.6) |
| Timor-Leste | 7.6 (5.6-10.0) | 7.8 (6.1-9.9) | 7.8 (6.4-9.3) |
| *Pooled estimate* | *4.9 (3.9-5.9)* | *6.4 (4.8-8.1)* | *5.8 (4.5-7.1)* |
| **Suicide ideation** |
| Bangladesh | 4.2 (3.1-5.6) | 5.7 (4.7-7.0) | 4.8 (4.0-5.7) |
| Bhutan | 9.5 (8.0-11.2) | 11.7 (10.3-13.3) | 10.7 (9.7-11.9) |
| Indonesia | 3.4 (2.9-4.1) | 5.4 (4.7-6.1) | 4.4 (4.0-4.9) |
| Maldives | 10.1 (7.9-12.8) | 14.4 (12.2-16.8) | 12.3 (10.7-14.1) |
| Myanmar | 6.8 (5.3-8.5) | 9.6 (8.0-11.4) | 8.3 (7.2-9.5) |
| Nepal | 12.7 (11.3-14.3) | 12.2 (10.9-13.6) | 12.5 (11.5-13.5) |
| Sri Lanka | 9.4 (7.6-11.4) | 8.3 (6.8-10.0) | 8.9 (7.7-10.2) |
| Thailand | 10.2 (8.8-11.8) | 11.4 (10.0-12.8) | 10.8 (9.9-11.9) |
| Timor-Leste | 9.5 (7.2-12.1) | 7.4 (5.7-9.3) | 8.3 (6.9-9.8) |
| *Pooled estimate* | *8.4 (5.8-10.9)* | *9.5 (7.3-11.7)* | *9.0 (6.7-11.3)* |
| **Suicide planning** |
| Bangladesh | 7.1 (5.6-8.8) | 7.1 (5.9-8.5) | 7.1 (6.1-8.1) |
| Bhutan | 11.9 (10.2-13.8) | 14.2 (12.6-15.9) | 13.2 (12.0-14.4) |
| Indonesia | 5.1 (4.5-5.9) | 5.5 (4.9-6.2) | 5.3 (4.9-5.8) |
| Maldives | 15.3 (12.5-18.3) | 19.9 (17.4-22.5) | 17.7 (15.9-19.7) |
| Myanmar | 4.5 (3.3-5.9) | 7.9 (6.5-9.6) | 6.3 (5.3-7.4) |
| Nepal | 13.1 (11.6-14.7) | 13.3 (11.9-14.7) | 13.2 (12.2-14.2) |
| Sri Lanka | 6.1 (4.6-7.8) | 6.3 (5.0-7.9) | 6.2 (5.2-7.3) |
| Thailand | 13.3 (11.8-15.1) | 12.5 (11.1-14.0) | 12.9 (11.9-14.0) |
| Timor-Leste | 11.4 (9.0-14.3) | 7.3 (5.6-9.2) | 9.2 (7.8-10.8) |
| *Pooled estimate* | *9.7 (7.0-12.3)* | *10.4 (7.7-13.1)* | *10.1 (7.5-12.7)* |
| **Suicide attempt** |
| Bangladesh | 5.9 (4.5-7.5) | 5.7 (4.6-6.9) | 5.8 (5.0-6.8) |
| Bhutan | 10.8 (9.2-12.6) | 10.2 (8.8-11.6) | 10.5 (9.4-11.6) |
| Indonesia | 3.1 (2.6-3.7) | 3.2 (2.7-3.8) | 3.2 (2.8-3.6) |
| Maldives | 11.3 (8.9-14.0) | 10.0 (8.1-12.1) | 10.5 (9.1-12.2) |
| Myanmar | 5.7 (4.3-7.3) | 9.5 (7.9-11.4) | 7.8 (6.7-9.0) |
| Nepal | 8.7 (7.4-10.0) | 9.0 (7.9-10.2) | 8.8 (8.0-9.7) |
| Sri Lanka | 6.4 (4.9-8.2) | 6.2 (4.9-7.7) | 6.3 (5.3-7.4) |
| Thailand | 8.8 (7.5-10.3) | 10.5 (9.2-11.9) | 9.7 (8.8-10.7) |
| Timor-Leste | 9.0 (6.8-11.5) | 7.1 (5.5-9.1) | 7.9 (6.6-9.4) |
| *Pooled estimate* | *7.7 (5.5-9.8)* | *7.9 (5.7-10.1)* | *7.8 (5.6-10.0)* |
| \*Country-specific sampling weights were used to yield country representative estimates |
| Random-effect meta-analysis was used to calculate the pooled prevalence estimates |



**Figure S1: Associations between psychological distress and various unhealthy dietary behaviours among adolescent boys.**

We used multivariable logistic regression models to estimate country-specific odds ratios (ORs) and then conducted a random-effect meta-analysis to pool the ORs. Regression models were adjusted for age, proxy for low socioeconomic status, peer support, parental support, bullying, having close friends, smoking, physical activity, and overweight.



**Figure S2: Associations between psychological distress and various unhealthy dietary behaviours among adolescent girls.**

We used multivariable logistic regression models to estimate country-specific odds ratios (ORs) and then conducted a random-effect meta-analysis to pool the ORs. Regression models were adjusted for age, proxy for low socioeconomic status, peer support, parental support, bullying, having close friends, smoking, physical activity, and overweight.



**Figure S3: Associations between loneliness and various unhealthy dietary behaviours among adolescents.**

We used multivariable logistic regression models to estimate country-specific odds ratios (ORs) and then conducted a random-effect meta-analysis to pool the ORs. Regression models were adjusted for age, proxy for low socioeconomic status, peer support, parental support, bullying, having close friends, smoking, physical activity, and overweight.



**Figure S4: Associations between anxiety and various unhealthy dietary behaviours among adolescents.**

We used multivariable logistic regression models to estimate country-specific odds ratios (ORs) and then conducted a random-effect meta-analysis to pool the ORs. Regression models were adjusted for age, proxy for low socioeconomic status, peer support, parental support, bullying, having close friends, smoking, physical activity, and overweight.



**Figure S5: Associations between suicide ideation and various unhealthy dietary behaviours among adolescents.**

We used multivariable logistic regression models to estimate country-specific odds ratios (ORs) and then conducted a random-effect meta-analysis to pool the ORs. Regression models were adjusted for age, proxy for low socioeconomic status, peer support, parental support, bullying, having close friends, smoking, physical activity, and overweight.



**Figure S6: Associations between suicide planning and various unhealthy dietary behaviours among adolescents.**

We used multivariable logistic regression models to estimate country-specific odds ratios (ORs) and then conducted a random-effect meta-analysis to pool the ORs. Regression models were adjusted for age, proxy for low socioeconomic status, peer support, parental support, bullying, having close friends, smoking, physical activity, and overweight.



**Figure S7: Associations between suicide attempt and various unhealthy dietary behaviours among adolescents.**

We used multivariable logistic regression models to estimate country-specific odds ratios (ORs) and then conducted a random-effect meta-analysis to pool the ORs. Regression models were adjusted for age, proxy for low socioeconomic status, peer support, parental support, bullying, having close friends, smoking, physical activity, and overweight.