Abstract: Background: Mental health literacy is a modifiable factor that influences mental health outcomes. Understanding such factors and their interaction with the socio-demographic characteristics of adolescent populations is of paramount importance in the design of targeted and effective promotions to improve mental health conditions. There is a limited amount of such evidence in low-income countries, including Ethiopia. Consequently, this study examined mental health literacy level and socio-demographic effects among adolescent students.

Methods: A cross-sectional study was conducted among adolescent students in urban Ethiopia using a pre-existing questionnaire. A sample of 934 adolescents in public and private schools was approached using multistage random sampling, with an 80.10% response rate. Statistical analysis was used involving descriptive statistics, one way ANOVA and hierarchical multivariable linear regression analysis. Statistical significance was considered at a threshold of p<0.05 and 95% CI were computed. Results: The mental health literacy score was normally distributed with mean =135.98 and SD=15.50. Mental health literacy was higher among female than male respondents (138.12 versus 133.84; p<0.01) and differently affected by socio-demographic factors. The combined factors of ethnicity/cultural affiliation, school grade, and level of parental education accounted for 10.7% and 8.9% of the variability in mental health literacy of female and male respondents, respectively. Ethnicity/cultural affiliation contributed the highest variability (6.3% in female and 6.1% in male respondents).

Conclusions: Mental health literacy was consistent with that reported in similar studies. Promotion of adolescent mental health through improving mental health literacy requires gender-based and culturally congruent approaches. Despite there being minimal contribution from socio-demographic factors, it is imperative that these differences are considered. This study highlights the need to understand other factors affecting the variability in adolescent mental health literacy.

Key Words: Adolescent mental health, mental health literacy, mental health promotion

Introduction: Mental health literacy is a modifiable factor that has been shown to influence mental health outcomes[1-4]. Understanding factors and how they interact with population socio-demographic characteristics is highly necessary in the design of targeted and effective schemes for mental health promotion, particularly in adolescent populations. However, there is very little evidence informing this field from populations in low-and-middle income countries, including Ethiopia. There is public interest in understanding what actions to take to promote health and prevent diseases[5]. Health promotion approaches need to consider the capacity, ability, and motivation of their target audience to access, process, understand, and use health information and health services. These factors define individuals' effectiveness to make proper health decisions, and these attributes combine to form what is termed health literacy[6-13]. However, this definition of health literacy does not specifically address mental health[2]. Mental health issues are often neglected and typically receive much less attention than physical health[14]. Consequently, mental health literacy, a term coined by Anthony F. Jorm and colleagues[15], has evolved as a separate construct of knowledge and beliefs about risk factors and causes, and the sources of help available[1-4]. It encompasses their ability to recognize specific disorders and types of psychological distress, interconnected with attitudes that facilitate recognition, knowledge and appropriate help-seeking[3,5,15]. It also takes into account the primary constructs of knowledge and beliefs about risk factors and causes of mental health problems, seeking of information related to mental health, and awareness of self-help interventions and professional help available[3,5,15].
From the theoretical viewpoint, the integrated theory of health behavior change (ITHBC) states that “health behavior change can be enhanced by fostering knowledge and beliefs, increasing self-regulation skills and abilities, and enhancing social facilitation” [16]. Adopting this model into the mental health context indicates that similarly, in an integrated theory of mental health behavior change, mental health literacy has proximal and distal mental health-related outcomes[16]. Epidemiological studies have also revealed that awareness of mental health issues and positive attitudes are highly associated with mental health service use, access to mental healthcare, and positive mental health outcomes[9,17,18].

Understanding the role of adolescent mental health literacy in promoting positive mental health has been shown to contribute to wellbeing during adolescence and adulthood[19,20]. It is informative in the design of targeted and effective mental health promotion resources. Adolescence is a critical period of physical, cognitive, emotional, and behavioral development [21-23] and has been identified as being a crucial period for instilling positive mental health behaviors, as these developments shape other health-related behaviors and skills, and abilities[24]. Many conditions associated with mental ill-health occur or develop during adolescence, and many continue into adulthood. As such, adolescence is a critical stage in which to influence individuals’ focus on mental health literacy and behavior change. However, empirical evidence shows that little emphasis had been placed on promoting positive mental health to adolescents, or preventing mental disorders, treatment-seeking, or seeking assistance for themselves and others[5]. From the limited amount of evidence about adolescent mental health literacy, it has been shown that only 25% of adolescents with mental health problems get professional help and treatment[25,26]. Further, 10-20% of children and adolescents globally are affected by mental health problems [27-30], which is reportedly higher in Africa, most notably in Sub-Saharan Africa[31], where Ethiopia accounts for the largest population in the region [32-34]. Evidence about adolescents’ capacity to recognize mental disorders, help-seeking intention and help-seeking behavior is limited [14]. A small number of organizations in high-income countries such as the USA, Australia, and Canada have launched nationwide adolescent mental health literacy campaigns[35-40]. However, mental health, much less adolescent mental health, has not always been viewed as a public health concern, again most notably in low-and-middle-income countries, including Africa. Health literacy in general, and mental health literacy, has rarely been mentioned in Ethiopian public health discourse.

Socio-demographic characteristics play a significant role in health behavior and health outcomes [41-43]. Mental health status, and knowledge and awareness about mental health are likely to be shaped by economic, environmental, and socio-demographic inter-individual differences[44]. For example, significant gender differences in mental health literacy were found among young Australians, with female participants being significantly more capable than their male counterparts at recognizing the symptoms associated with mental illness[45]. Understanding the relationships between socio-demographic characteristics and mental health literacy is imperative for considering how these differences affect the efficacy of materials on mental health promotion targeted at adolescents. However, there is very little quantitative evidence regarding the effects of gender, age, education level, ethnicity/cultural/religious affiliation, and family background on adolescent mental health literacy[46]. Therefore, the present study examined the level of mental health literacy among adolescents in urban Ethiopia, and its relationship with socio-demographic characteristics such as gender, age, school grade, ethnicity/culture, and maternal and paternal education levels.

Materials and Methods

Study setting and design

The present study was a cross-sectional survey carried out between April and July 2020 in Dire Dawa, a city in Ethiopia known for its ethnic, cultural and language diversity. The study population was adolescents in urban schools in grades 5 to 12, aged 11-19 years.

Sample size and sampling

An estimated minimum sample size (n=565) was obtained assuming a 95% confidence level, 5% significance level (α), a standard deviation of a normal distribution (Z1-α/2= 1.96), standard deviation of the measure in the population (σ=18.183), and margin of sampling error (d=1.5) using an equation[50].

\[
\begin{align*}
n & \geq \left( \frac{Z_{\alpha/2} \times \sigma}{d}\right)^2 = \left( \frac{1.96 \times 18.183}{1.5} \right)^2 = \frac{564.514}{565} = 565
\end{align*}
\]

However, about a sample size of 934 was targeted when taking into account the design effect (d=1.5) and considering a 10% non-responders and dropout rate.

Study participants were selected using combination of multistage (schools, classrooms, then individual students) systematic, and random methods. A list of the students in fixed intervals of their roll numbers sampling methods. Lists of schools and students were obtained from Dire Dawa Education Bureau. The statistics of the student population of each sub-city was determined, and a sample of public and private schools was selected randomly. Finally, sample participants were randomly selected from each selected school, proportional to the number of students for that school’s category and targeted grade level (Figure 1).

Data Collection Tools

Mental health literacy was measured using the mental health literacy questionnaire, MHLq[43], a freely available and validated tool used in adolescent populations [1,48-56]. It was further tested for its reliability (Cronbach’s alpha=0.834) in the present study setting. The version of the MHLq used in this study comprised 33 items, with each item eliciting a response using a five-point Likert scale (1=strongly disagree, 2=slightly disagree, 3=neither agree nor disagree, 4=slightly agree, 5=strongly agree). The MHLq items comprise statements covering recognition, knowledge, attitudes, and beliefs of adolescents towards mental health issues[1-4].

Statistical Analysis

Analyses were conducted using SPSS version 23. Statistical significance was considered at a threshold of p≤0.05 and 95% confidence intervals were used. Reverse scoring was performed for negatively-keyed items (Q7, Q12, Q15, Q17, Q24, & Q26) of the MHLq before computing each individual’s mean score. Descriptive statistics were used to analyze the socio-demographic characteristics and the distribution of mental health literacy. The mean, standard deviation, median, mode, range, interquartile range, skewness, and kurtosis of the mental health literacy score were computed. A one-way ANOVA was used to test the variance in mental health literacy with the socio-demographic characteristics captured[57]. Bivariate and hierarchical multivariate linear regression analysis was performed, adjusting for age, to analyze the association between socio-demographic characteristics and mental health literacy. Each socio-demographic category was transformed into a binary variable with no=0 and yes=1 before use in the predictive regression model.

Ethical Considerations

Ethical approval was obtained from the KIIT University, KIMS, Institutional Ethics committee (Reference: KIIT/KIMS/IEC/63/2019) and Haryana University, College of Health and Medical Sciences Institutional Health Research Review Ethics Committee (Reference: 00.H.M.S./10.03/3763/ 2020).
Written informed consent was obtained from school principals, from the parents of adolescents aged under 15 years, and from all participants.

Results
Socio-demographic characteristics
From the 934 potential participants who were approached, 751 (80.41%) students participated in the study, comprising 50.1% male participants and 49.9% female participants. Of those who completed the study, 2.66% of respondents were removed due to having significant missing data. As such, the responses of 731 participants formed the sample, which represented 129.38% of the calculated minimum (n=565) study sample size (Table 2). The mean and standard deviation of participants age was 16.27±2.19 years for male participants and 15.95±2.02 years for female participants. The socio-demographic characteristics of these participants, including their ethnicity/cultural affiliation, age group, grade level, and parental education (maternal and paternal) are given in Table 1.

Table 1: Socio-demographic characteristics of study participants

<table>
<thead>
<tr>
<th>Socio-demographic Characteristics</th>
<th>Male (n=366)</th>
<th>Female (n=365)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (SD*)</td>
<td>16.27(2.19)</td>
<td>15.95(2.02)</td>
<td>0.037</td>
</tr>
<tr>
<td>Ethnicity / Cultural affiliation</td>
<td></td>
<td></td>
<td>0.000</td>
</tr>
<tr>
<td>Amhara</td>
<td>43.0%</td>
<td>57.0%</td>
<td></td>
</tr>
<tr>
<td>Oromo</td>
<td>62.8%</td>
<td>37.2%</td>
<td></td>
</tr>
<tr>
<td>Somali</td>
<td>51.2%</td>
<td>48.8%</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>52.6%</td>
<td>47.4%</td>
<td></td>
</tr>
<tr>
<td>Age group in years</td>
<td></td>
<td></td>
<td>0.079</td>
</tr>
<tr>
<td>11-13</td>
<td>13.7%</td>
<td>12.9%</td>
<td></td>
</tr>
<tr>
<td>14-16</td>
<td>36.6%</td>
<td>44.7%</td>
<td></td>
</tr>
<tr>
<td>17-19</td>
<td>49.7%</td>
<td>42.5%</td>
<td></td>
</tr>
<tr>
<td>School grade level</td>
<td></td>
<td></td>
<td>0.571</td>
</tr>
<tr>
<td>Upper elementary Grade 5-8</td>
<td>39.3%</td>
<td>43.0%</td>
<td></td>
</tr>
<tr>
<td>Lower Secondary Grade 9-10</td>
<td>39.6%</td>
<td>40.0%</td>
<td></td>
</tr>
<tr>
<td>Upper secondary Grade 11-12</td>
<td>21.0%</td>
<td>17.0%</td>
<td></td>
</tr>
<tr>
<td>Maternal education level</td>
<td></td>
<td></td>
<td>0.575</td>
</tr>
<tr>
<td>Non-educated</td>
<td>63.7%</td>
<td>60.5%</td>
<td></td>
</tr>
<tr>
<td>Elementary Level</td>
<td>8.5%</td>
<td>9.3%</td>
<td></td>
</tr>
<tr>
<td>Secondary level</td>
<td>19.9%</td>
<td>23.6%</td>
<td></td>
</tr>
<tr>
<td>College or above</td>
<td>7.9%</td>
<td>6.6%</td>
<td></td>
</tr>
<tr>
<td>Paternal education level</td>
<td></td>
<td></td>
<td>0.128</td>
</tr>
<tr>
<td>Non-educated</td>
<td>54.6%</td>
<td>54.2%</td>
<td></td>
</tr>
<tr>
<td>Elementary Level</td>
<td>5.7%</td>
<td>2.5%</td>
<td></td>
</tr>
<tr>
<td>Secondary level</td>
<td>24.6%</td>
<td>28.2%</td>
<td></td>
</tr>
<tr>
<td>College or above</td>
<td>15.0%</td>
<td>15.1%</td>
<td></td>
</tr>
</tbody>
</table>

Level of mental health literacy
The mental health literacy score could be approximated to a normal distribution, with a skew was nearly 1.32. The mean mental health literacy score was 135.975±15.499 with median and interquartile ranges of 139 and 122-156, respectively. As shown in Figure 2, mental health literacy varied with participant gender, with female participants showing slightly higher mental health literacy (M=138.12, SD=13.588) than male participants (M=133.64, SD=16.945), F(1,729)=6.120, p=0.014.

The association between mental health literacy and socio-demographic factors
The effect of ethnicity/cultural affiliation of mental health literacy score was highly significant for both male and female respondents. It was significantly different between male adolescents across their ethnic/cultural affiliations with score of Amhara (M=135.83, SD=16.93), Oromo (M=133.59, SD=15.71), Somalia (M=124.48, SD=18.03) and other ethnic/cultural affiliations (M=138.90, SD=16.08), F(3,362)=6.115, p=0.000. Similarly, significant difference was observed between female adolescents with scores in Amhara (M=140.56, SD=12.96), Oromo (M=134.74, SD=15.11), Somali (M=132.24,SD=12.37) and other ethnic/cultural affiliations (M=135.44, SD=9.71), F(3,361)=7.243, p=0.000. Maternal education (F(3,361)=2.866, p=0.037) and grade (F(2,362)=4.466, p=0.012) were significantly associated with mental health literacy in female but not male adolescents. There were no significant effects of paternal education for either female (F(3,362)=0.360, p=0.782) or male (F(2,363)=1.811, p=0.165) participants (Table 2).

Mental health literacy level was inversely associated with age for both male and female respondents. Ethnicity also had a significant association with mental health literacy, and students who were Oromo (p<0.001), Somali (p<0.001) and other ethnicity or culture (p<0.01) exhibited lower mental health literacy than those with an Amhara ethnic/cultural affiliation. Level of mental health literacy was associated with grade, and this effect was especially significant in female respondents (p<0.001). The effect of maternal and paternal education level was different in male and female participants, with male students showing a positive association and female students showing a negative association, despite there being an inconsistency in school grade between those with parents who were non-educated to those with college-level education (Table 3).

Hierarchical multiple regression analysis revealed the contribution of the socio-demographic factors to explaining the variability in mental health literacy. Ethnicity/cultural affiliation contributed about 6.5% of the variance of mental health literacy for female adolescents, and grade/education level contributed an additional 2.4% of the variability. Maternal and paternal education levels accounted for 2.1% of the variance in female adolescents' mental health literacy. Mental health literacy was independently associated with parental education level and was negatively associated with respondents’ school grade. All factors combined accounted for 10.7% of the variability in mental health literacy of female adolescents (Table 4).


Figure 1: Sampling method for selecting participants from each sub-city and school.

Figure 2: Descriptive analysis of mental health literacy for (a) male (b) female and (c) both male and female participants.
### Table 2: The association between mental health literacy and socio-demographic characteristics (One way ANOVA at p<0.05, 95% CI)

<table>
<thead>
<tr>
<th>Socio-demographic characteristics</th>
<th>Mental health literacy level</th>
<th></th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male adolescents</td>
<td>Female adolescents</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean score (SD) 95% CI p-value</td>
<td>Mean score (SD) 95% CI p-value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total (altogether)</strong></td>
<td>133.84(16.95) 132.09-135.58</td>
<td>138.12(13.59) 136.72-139.52</td>
<td>.000</td>
<td>.65</td>
<td>.000</td>
<td>.012</td>
</tr>
<tr>
<td><strong>Ethnicity/cultural affiliation</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amhara</td>
<td>135.83(16.93) 133.28-138.37</td>
<td>140.56(12.96) 138.87-142.25</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Oromo</td>
<td>133.59(15.71) 130.87-136.32</td>
<td>134.74(15.11) 131.31-138.17</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Somali</td>
<td>124.48(18.03) 119.00-129.96</td>
<td>132.24(12.37) 128.38-136.09</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Others</td>
<td>138.90(16.08) 131.38-146.42</td>
<td>135.44(9.71) 130.61-140.28</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td><strong>School grade</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Grade 5-8</td>
<td>135.01(14.70) 132.59-137.43</td>
<td>138.57(13.26) 136.48-140.66</td>
<td>.012</td>
<td>.012</td>
<td>.012</td>
<td>.012</td>
</tr>
<tr>
<td>Grade 9-10</td>
<td>131.77(18.83) 128.68-134.86</td>
<td>135.99(14.65) 133.60-138.39</td>
<td>.012</td>
<td>.012</td>
<td>.012</td>
<td>.012</td>
</tr>
<tr>
<td>Grade 11-12</td>
<td>135.52(16.94) 131.67-139.36</td>
<td>141.98(10.74) 139.26-144.71</td>
<td>.012</td>
<td>.012</td>
<td>.012</td>
<td>.012</td>
</tr>
<tr>
<td><strong>Maternal education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-educated</td>
<td>132.72(16.60) 130.58-134.86</td>
<td>137.01(13.22) 135.26-137.76</td>
<td>.054</td>
<td>.054</td>
<td>.054</td>
<td>.054</td>
</tr>
<tr>
<td>Elementary</td>
<td>131.94(19.51) 124.78-139.09</td>
<td>137.85(12.77) 133.40-142.31</td>
<td>.054</td>
<td>.054</td>
<td>.054</td>
<td>.054</td>
</tr>
<tr>
<td>Secondary</td>
<td>138.71(13.79) 135.49-141.93</td>
<td>141.77(14.20) 138.72-144.81</td>
<td>.054</td>
<td>.054</td>
<td>.054</td>
<td>.054</td>
</tr>
<tr>
<td>College</td>
<td>132.55(22.04) 124.17-140.94</td>
<td>135.67(14.23) 129.66-141.68</td>
<td>.054</td>
<td>.054</td>
<td>.054</td>
<td>.054</td>
</tr>
<tr>
<td><strong>Paternal education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-educated</td>
<td>133.20(16.86) 130.85-135.55</td>
<td>138.24(12.50) 136.49-139.99</td>
<td>.7820</td>
<td>.7820</td>
<td>.7820</td>
<td>.7820</td>
</tr>
<tr>
<td>Elementary</td>
<td>134.95(14.79) 128.22-141.68</td>
<td>134.67(17.23) 121.43-147.91</td>
<td>.7820</td>
<td>.7820</td>
<td>.7820</td>
<td>.7820</td>
</tr>
<tr>
<td>Secondary</td>
<td>133.81(17.14) 130.22-137.40</td>
<td>137.79(15.89) 134.68-140.89</td>
<td>.7820</td>
<td>.7820</td>
<td>.7820</td>
<td>.7820</td>
</tr>
<tr>
<td>College</td>
<td>135.76(17.96) 130.91-140.62</td>
<td>138.87(12.28) 135.55-142.19</td>
<td>.7820</td>
<td>.7820</td>
<td>.7820</td>
<td>.7820</td>
</tr>
</tbody>
</table>

### Table 3: Socio-demographic factors associated with mental health literacy level among male and female adolescents in an urban, Ethiopia (bi-variate analysis adjusting for age showing coefficient and 95% CI)

<table>
<thead>
<tr>
<th>Age (yrs)</th>
<th>Male Coefficient (95% CI)</th>
<th>Female Coefficient (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-0.511(-1.307-0.285)</td>
<td>-.425(-1.117-0.267)</td>
</tr>
</tbody>
</table>

#### Ethnicity/cultural affiliation

- **Amhara (REF)**
  - Oromo: -3.682(-7.493-1.130)**
  - Others: -5.828(-13.355-1.699)**

- **School grade**
  - Grade 9-10: -2.621(-7.138-1.896)**
  - Grade 5-8: -0.865(-5.527-3.797)**

- **Paternal education**
  - College (REF)
    - Secondary education: 1.926(-5.662-9.514)
    - Non-educated: -2.262(-9.131-4.606)
  - College (REF)
    - Secondary education: 1.096(-4.653-6.845)
    - Elementary education: 2.898(-5.561-11.356)
    - Non-educated: 1.442(-3.666-6.550)

** P<0.001,  * P<0.01
This study assessed the level of adolescent mental health literacy in Dire Dawa city, Ethiopia and investigated its association with participant socio-demographic characteristics. The findings supported the hypothesis that these characteristics showed significant association with the adolescent mental health literacy, and are consistent with those previously reported around the world[49,52,58-61] Crucially, these findings contribute to a limited number of quantitative studies from middle and low-income countries, specifically Ethiopia.

The study found differences in the pattern of mental health literacy level between female and male adolescents. Female participants had overall slightly higher levels of mental health literacy (mean = 138.12±13.59) than male participants (mean = 133.64±16.95), consistent with other studies. A previous study showed the mental health literacy level of female Portuguese adolescents (mean=132.68±10.64) to be higher than their male counterparts (mean = 130.49±11.80) [49]. Gender differences in mental health literacy have been noted among students from Australia[54] and the USA[52,58] with studies consistently reporting lower mental health literacy among male participants. A nationwide survey from the USA reported males to have a more negative attitude than females regarding help-seeking behaviors related to mental ill-health[59].

Aside from the gender difference in mental health literacy levels, some other socio-demographic factors contributed to the difference, and further were demonstrated to differently

Similarly, ethnicity/cultural affiliation accounted for 6.1% of the variance in mental health literacy for male adolescents, and grade/education level contributed an additional 1% of the variability. Maternal and paternal education levels combined accounted for 2% of the variability in male adolescents

### Table 4: Socio-demographic Factors associated mental health literacy level among male and female adolescents in an Urban Ethiopia (multivariate linear regression analysis showing coefficient and 95% CI).

<table>
<thead>
<tr>
<th>Socio-demographic characteristics</th>
<th>Male Adolescents</th>
<th>Female Adolescents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
</tr>
<tr>
<td>Coeff</td>
<td>95% CI</td>
<td>Coeff</td>
</tr>
<tr>
<td>Grade 5-8</td>
<td>-4.741</td>
<td>-12.464, 2.982</td>
</tr>
</tbody>
</table>

**Notes:** Factors included in the models: Model 1: Ethnic/cultural affiliation; Model 2: Model 1+ school grade of the adolescents; Model 3: Model 2+ Parental educational (maternal and paternal education status). **P<0.001, *P<0.01, Coeff = Coefficients**

Discussion

This study assessed the level of adolescent mental health literacy in Dire Dawa city, Ethiopia and investigated its association with participant socio-demographic characteristics. The findings supported the hypothesis that these characteristics showed significant association with the adolescent mental health literacy, and are consistent with those previously reported around the world[49,52,58-61] Crucially, these findings contribute to a limited number of quantitative studies from middle and low-income countries, specifically Ethiopia.

The study found differences in the pattern of mental health literacy level between female and male adolescents. Female participants had overall slightly higher levels of mental health literacy (mean = 138.12±13.59) than male participants (mean = 133.64±16.95), consistent with other studies. A previous study showed the mental health literacy level of female Portuguese adolescents (mean=132.68±10.64) to be higher than their male counterparts (mean = 130.49±11.80) [49]. Gender differences in mental health literacy have been noted among students from Australia[54] and the USA[52,58] with studies consistently reporting lower mental health literacy among male participants. A nationwide survey from the USA reported males to have a more negative attitude than females regarding help-seeking behaviors related to mental ill-health[59].

Aside from the gender difference in mental health literacy levels, some other socio-demographic factors contributed to the difference, and further were demonstrated to differently
affect male and female participants[52]. Ethnicity/cultural affiliation, school grade, and parental education level were associated with mental health literacy, with these factors combined accounting for 10.7% and 8.9% of the variability in mental health literacy of female and male adolescents, respectively. Previous studies also reported similar effects of these characteristics[62-64]. However, this indicates that these factors account for a relatively minimal contribution of the variance in mental health literacy, emphasizing the need to understand the influence of other factors. Schooling has been reported to have a significant effect on the mental health literacy of adolescents[17,65,66]. For example, a recent study in the USA indicated that adolescents from lower grades showed lower mental health literacy levels[66]. Chinese adolescents from middle grades had higher mental health literacy level than those in primary grades, and college students were higher still[67]. The present study was consistent with these findings. Mental health literacy level was associated with school grade in the present study, and this effect was especially significant in female adolescents (p<0.01). School grade contributed about 2.4% and 1% of the variability in mental health literacy of female and male adolescents, respectively, with a similar pattern of gender variations as discussed earlier.

Ethnicity and cultural affiliations have been shown to influence individuals’ knowledge, attitudes, and beliefs towards mental health issues[59,66,68,69]. Cultural factors are closely associated with race and ethnicity, with differing attitudes towards mental illness and disparities affecting adherence to mental health services[69]. In countries that exhibit multicultural and multi-ethnic diversity, such as Ethiopia, it is paramount to demonstrate an understanding of cultural differences when addressing mental health literacy. The present study found an association between ethnicity/cultural affiliation and mental health literacy representing 6.5% and 6.1% of the variability in mental health literacy in female and male adolescents, respectively. Ethnic/cultural affiliation has been shown to be the single most significant factor predicting the use of mental health services[66] and predictive of mental health literacy[71-74] as well as health-related behaviors and other health outcomes[69]. The affiliations of Oromo (p<0.001), Somali (p<0.001) or another ethnicity/culture (p<0.01) were all negatively associated with mental health literacy, compared to participants with the Amhara ethnic or cultural affiliation. This is likely related to the behavioral norms and shared cultural values or ethnic identity strongly influencing social conventions, psychological processes, and behavior[69]. Additionally, in the Ethiopian context, ethnic and cultural affiliation is strongly interwoven with religious affiliation. Religious affiliation tends to dictate beliefs, attitudes, and behaviors in many other aspects of life that will in turn affect mental health literacy and mental health outcomes[71]. This collection of beliefs, practices, and rituals with shared spiritual values determines an individual's beliefs, exposures, knowledge, and behavior towards health determinants and outcomes[72]. Previous cross-sectional studies have found significant and positive associations between religious involvement and mental health, with higher levels of social support and a lower prevalence of substance abuse[73]. There may be a positive effect of spirituality and religious involvement on mental health outcomes. For individuals who are active in religious practice, praying and reading spiritual materials may enhance positive mood through a sense of a connection with supreme power. Similarly, these individuals may be more likely to follow healthy lifestyles due to the positive social influence of their religious practice, promoting awareness of other factors issues[74]. Positive psychological and physical health outcomes have been reported from communities with high faith-based participation, where religious activities in many cases serve as an alternative source of support and treatment for individuals with mental illness[75]. Positive emotions have been related to religious belief and practice[52]. These factors combined are likely also reflected in their children's views. The present study found that mental health literacy was differently associated with parental education level in male and female adolescents, accounting for 2.1% and 2% of the variance in mental health literacy of female and male adolescents, respectively. There is also existing evidence showing similar associations, for example, a study from Sri Lanka revealed that adolescents whose mothers attended college or higher education scored the lowest mental health literacy score, consistent with this present finding[76]. This may be due to educated mothers having significant work commitments, and consequently having less time to spend with their children during the critical mental and emotional development stages.

**Conclusion**

The present study has demonstrated several associations between mental health literacy and socio-demographic factors that are in agreement with previous evidence from high-income countries despite a paucity of comparative quantitative evidence from low- and middle-income countries, including Ethiopia. Female adolescents had slightly higher levels of mental health literacy than male adolescents. Mental health literacy level was also differently affected by socioeconomic factors. For example, a study in Ethiopia revealed a strong association between spiritual and religious beliefs in male adolescents, and parents of male adolescents, accounting for 2.1% and 2% of the variance in mental health literacy of female and male adolescents, respectively. There is also existing evidence showing similar associations, for example, a study from Sri Lanka revealed that adolescents whose mothers attended college or higher education scored the lowest mental health literacy score, consistent with this present finding[76]. This may be due to educated mothers having significant work commitments, and consequently having less time to spend with their children during the critical mental and emotional development stages.

**Data availability:** Data will be provided following a reasonable request to the corresponding author.

**Competing interests:** The authors have no competing interests.
References


