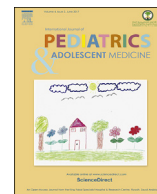


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Original research article

Suicidal ideation and planning among Palestinian middle school students living in Gaza Strip, West Bank, and United Nations Relief and Works Agency (UNRWA) camps

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ABSTRACT

The goal of this study was to identify the prevalence and correlates of suicidal thinking among Palestinian middle school students by using complex samples analysis to explore data about suicidal ideation and suicidal planning in the past year from 14,303 students in grades 7, 8, and 9 (roughly ages 13–15 years) who participated in the Global School-based Student Health Survey (GSHS) in 2010 in the Occupied Palestinian Territory (OPT) and United Nations Relief and Works Agency (UNRWA) refugee camps. We also analyzed data from the seven other GSHS-participating countries from the Eastern Mediterranean region: Iraq, Jordan, Kuwait, Lebanon, Morocco, Tunisia, and the United Arab Emirates. The overall prevalence of suicidal ideation and/or planning was 25.6%. Males were more likely than females to report suicidal thinking. The health behaviors and exposures most strongly associated with suicidal thinking were marijuana use, having no close friends, tobacco use, loneliness, worry-induced insomnia, food insecurity, and being the victim of a bully. Being involved in physical fights and attacks, skipping school, and perceptions of limited parental support were also associated with suicidal thinking. The prevalence of suicidal thinking among Palestinian adolescents was higher than the rates in the other GSHS-participating countries, pointing toward a need for improved access to adolescent mental health services.

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1. Introduction

The term Occupied Palestinian Territory (OPT) has been used by the United Nations to describe the land occupied by Israel after the 1967 Arab-Israeli War, primarily in the West Bank and the Gaza Strip [1]. Many Palestinians who were living in British Mandate of Palestine prior to 1948 and who were displaced after the conflict are now registered refugees, as are many of their descendants who continue to live in the region. Today, there are about 4.6 million registered Palestinian refugees living in the OPT, Lebanon, Syria, and Jordan [2]. About one-third of these refugees live in now-urban “camps” established after the 1948 Arab-Israeli War; the remainder

live in the region but outside of camps [1]. About 1.8 million Palestinian refugees live in the OPT, with the remaining 2.8 million living outside it [2]. A large proportion of Palestinian refugees report fearing for their safety and having anxiety about the possibility of losing their income, home, and land, and becoming unable to provide for their family [1].

Adolescents who are refugees encounter numerous exposures that may increase their risk for mental health disorders [3,4]. The unfavorable social and living conditions experienced by many refugees have been described as creating “internalized oppression,” in which members of marginalized populations come to accept that the prejudices against them by the dominant society are valid [5]. Cognitive behavioral theory postulates that chronic exposure to oppressive environments creates distorted thoughts and perceptions that lead to psychological distress [6], and the resulting internalized oppression is characterized by low self-esteem and by self-hatred [5]. Previous studies conducted among adolescents who were seeking asylum as refugees or who were from refugee families

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have found that these young people report higher rates of anxiety and other mental health issues than their non-refugee age-group peers [7–9]. Palestinian adolescents have been found to have elevated rates of anxiety, posttraumatic stress disorder (PTSD), and depression [10,11].

Depression, anxiety, and other mental health conditions are associated with an increased risk of suicidal thoughts and behaviors among adolescents [12,13]. The terminology for suicidality has not been standardized [14], but suicidal thinking may include suicidal ideation—that is, having thoughts about wanting to intentionally end one's life—and suicidal planning, in which an individual makes decisions about how he or she would carry out a potentially fatal act of self-harm. Most adolescents (and adults) who report suicidal thinking do not attempt to commit suicide, and many acts of self-harm are non-fatal [15,16]. Even so, self-inflicted injuries are among the top ten most common causes of disability-adjusted life years lost annually among adolescents worldwide [17]. Self-inflicted injuries are also about the tenth most common cause of death among 10- to 14-year-olds globally, accounting for more than 2% of fatalities in this age group [18]. The suicide mortality rate in the Eastern Mediterranean region is estimated to be lower than the global average [19]. However, suicide may be under-reported due to unreliable vital statistics, religious considerations, legal consequences, and social stigma [20].

The bulk of the epidemiological evidence on suicidal behavior originates from high-income countries, and more research is needed on the factors associated with suicidal ideation and behavior in low- and middle-income countries [15]. Previous publications from the Eastern Mediterranean Region suggest that suicidal thinking is common among students. A study in Lebanon found that about 16% of students aged 11–16 years reported suicidal ideation [21]. A study in Morocco found that 12.8% of 11- to 14-year-old students had suicidal thinking and 6.5% reported suicidal planning [22]. Previous studies of adolescents in the region suggested that suicidal thinking is associated with poor mental health, substance use, victimization, and lack of parental attachment [21,23], but this association has not been previously examined among early adolescents in the OPT.

This paper presents an analysis of suicidal thinking among participants in the Global School-based Student Health Survey (GSHS) conducted between March 2010 and June 2010 among Palestinian middle school students living in the OPT as well as in United Nations Relief and Works Agency (UNRWA) camps in Gaza, the West Bank, Jordan, Lebanon, and Syria. Our specific aims were (1) to determine the age- and sex-specific prevalence rates and the overall prevalence rate of suicidal ideation and suicidal planning among Palestinian students in grades 7, 8, and 9, (2) to compare the rates of suicidal thinking in the OPT to the rates in all of the other seven GSHS-participating countries in the WHO Eastern Mediterranean region that included the two suicidal thinking questions in their public-use data sets, and (3) to examine the associations between various risk behaviors and other exposures in this population with self-reports of suicidal thinking.

2. Patients and methods

The GSHS is a collaborative effort between the WHO and the United States Centers for Disease Control and Prevention (U.S. CDC) that assesses the health and risk behaviors of 13- to 15-year-old students. The same protocol is used in all countries that participate in the GSHS. This protocol was approved by the WHO and the U.S. CDC, and each participating country also secures ethical approval from their Ministry of Health and/or Ministry of Education (or the national equivalents of these bodies). Prior to implementation of the study, the school authorities from each sampled school are

asked for permission for the study to be conducted in their schools. Participation in the survey is voluntary, and individual students can opt not to complete the questionnaire.

Each of the seven sites participating in the Palestinian GSHS used the same standardized GSHS methods that are applied by all GSHS studies around the world to identify and recruit a random sample of students for the study. In brief, a two-stage cluster sample design was used to identify a representative sample of students in grades 7, 8, and 9. In the first stage, schools that included any of these three grade levels were randomly sampled from a list of all schools serving the Palestinian populations at each of the seven survey sites using a probability proportional to size approach, a method that accounts for the varying size of each cluster within the population. In the second stage, classes of students in grades 7 to 9 were randomly sampled from among the classes in the sampled schools. All students in these sampled classrooms were invited to volunteer to participate in the study. Questionnaires were completed by students during one class period during regular school hours. Responses were recorded by the students on computer-scannable answer sheets. No identifiable information was collected.

In total, 14,558 students from seven sites participated in the Palestinian GSHS. The participation rate among sampled schools was 100% at six of the sites and 96% in UNRWA West Bank [24]. The student participation rate at the seven sites ranged from 93% to 96% [24]. Students with missing information on both suicidal ideation and planning were excluded from all analyses, so the final dataset consisted of 14,303 students, which was 93% of the sampled participants after accounting for some schools and some participants declining to participate. Since more than 98% of the participating students answered both of the suicidal thinking questions, the results of this analysis can be considered highly representative of the sampled population.

The two key questions explored during this analysis were suicide ideation, which was assessed with the yes/no question “*During the past 12 months did you ever seriously consider attempting suicide?*,” and suicide planning, assessed with the yes/no question “*During the past 12 months, did you make a plan about how you would attempt suicide?*” Students who answered both questions and marked a “yes” response for one or two of the two questions were considered to have expressed suicidal thinking during the past year. Students who answered “no” to both of these questions were coded as not having had suicidal thinking during the past year. Students who answered only one of the two suicidal thinking questions were assigned a value of “yes” or “no” for the combined suicidal thinking variable, whichever was the response for the one question they answered about suicidal thinking. The rates of suicidal ideation, planning, and thinking were calculated for all seven sites of the Palestinian GSHS and also, as a comparison, for all of the other seven GSHS-participating countries in the WHO Eastern Mediterranean region that included the two suicidal thinking questions in their public-use data sets. The Eastern Mediterranean region encompasses North Africa and the Middle East.

The relationships between suicidal thinking and demographic characteristics (such as age, sex, and grade level), other mental health characteristics, substance use, exposure to violence and victimization, relationships with parents and peers, having kind and helpful peers, having close friends, and other factors were examined for each site where the Palestinian GSHS was conducted (Although the survey instrument included a question about sadness and hopelessness during the past year, this variable was not included in the public use dataset). The results tables provide the definitions for which responses to these questions were considered to indicate risk categories and risky behaviors. To avoid overestimating bullying rates, students who said they had been

bullied on one or more days in the past month but then reported not being bullied in the follow-up question about the type of bullying experienced were considered not to have been bullied.

Data were analyzed using Epi Info and SPSS version 20 (IBM, Chicago, IL) with a significance level of $\alpha = 0.05$. Complex samples analysis uses the primary sampling unit (PSU), stratum, and weighting variables provided with the GSHS data to account for the two-stage sampling method and to adjust for minor differences between participants and the Palestinian middle school population as a whole. For example, if participating schools reported 50% female students but 53% of participants were girls, the weighting variable would correct this discrepancy by weighting each female participant with a number slightly less than 1.00 and each male with a number slightly greater than 1.00. Chi-square tests were used to examine the associations between suicidal ideation and/or suicidal planning and other variables. Because the sample sizes at each site were not proportional to the number of residents of the Gaza Strip, West Bank, or the five UNRWA sites, the seven datasets were not merged into one file but were instead analyzed separately. Comprehensive Meta-Analysis (CMA) version 3 (Englewood, NJ) was used to calculate pooled proportions and odds ratios along with their respective 95% confidence interval (CIs). Because of the heterogeneity across study sites indicated by the Q statistic and the I² index, a random-effects model was used for meta-analysis.

3. Results

The 14,303 participants were distributed nearly equally across both genders and all three grade levels (Table 1). The prevalence of suicidal ideation at each of the seven OPT sites ranged from 14.6% (Lebanon) to 23.7% (UNRWA West Bank), with a pooled prevalence of 19.9% (Table 2a). The prevalence of suicidal planning ranged from 14.2% (Lebanon) to 18.5% (UNRWA West Bank), with a pooled percentage of 17.1%. The combined prevalence of reporting one or both types of suicidal thinking ranged from 19.9% (Lebanon) to 28.5% (West Bank), with a pooled rate of 25.6% (95% CI: 23.6%, 27.8%). This rate is higher than the rates reported from any of the other GSHS-

participating countries in the Eastern Mediterranean region: Iraq (22.0%), Jordan (23.7%), Kuwait (22.7%), Lebanon (18.5%), Morocco (22.6%), Tunisia (23.2%), and the United Arab Emirates (15.6%) (Table 2b). Based on pooled analysis of the Palestinian GSHS data, more males than females reported suicidal thinking, but there were not consistent differences in suicidal thinking by age or by grade (Table 3). In UNRWA Syria, females had a higher rate of suicidal thinking than males (29.1% vs. 24.4%, $p = 0.015$).

The participants reported engaging in a variety of risk behaviors (Table 4), many of which were associated with an increased likelihood of suicidal thinking (Table 5). The strongest predictors of reporting suicidal ideation and/or planning were marijuana use (pOR (95% CI) = 4.9 (3.9, 6.1)) and having no close friends (3.7 (3.1, 4.3)), but these exposures were reported by only 3.3% and 7.4% of the participants, respectively. The 19.9% of students who used tobacco in the past month had an increased risk of suicidal thinking (3.5 (3.0, 4.0)), as did the 13.9% of students who reported usually feeling lonely during the past year (3.3 (2.7, 3.9)) and the 16.4% of students who reported usually having anxiety-induced insomnia during the past year (2.9 (2.5, 3.4)). The 43.4% of students who reported being the victim of a bully during the past month had nearly twice the odds of suicidal thinking of non-bullied students (1.9 (1.7, 2.1)). The 39.5% of students who were involved in a physical fight during the past year had nearly twice the odds of suicidal thinking as non-fighting students (1.9 (1.6, 2.2)), as did the 40.4% of students who were physically attacked in the past year (1.8 (1.7, 2.0)). The 34.7% of students who reported missing classes or school without permission on one or more of the past 30 days had an increased risk of suicidal thinking (1.6 (1.5, 1.8)), and so did the 42.4% of students who reported feeling that their parents did not understand their problems or worries in the past month had an elevated risk of suicidal thinking (1.5 (1.4, 1.6)). As expected, consumption of carbonated beverages was not associated with suicidal thinking; this result is evidence that the large number of statistically significant associations is not merely a function of high statistical power resulting from a large sample size but reflects true associations in the populations.

Table 1
Number of participants and weighted proportion of participants by age, sex, and grade.

| | Gaza Strip | West Bank | UNRWA Gaza | UNRWA Jordan | UNRWA Lebanon | UNRWA Syria | UNRWA West Bank |
|---|------------|-----------|------------|--------------|---------------|-------------|-----------------|
| School participation rate (%) | 100 | 100 | 100 | 100 | 100 | 100 | 96 |
| Student participation rate within participating schools (%) | 95 | 94 | 95 | 93 | 96 | 94 | 93 |
| Overall GSHS participation rate (%) | 95 | 94 | 95 | 93 | 96 | 94 | 90 |
| Total number of participants | 2677 | 1908 | 2122 | 1529 | 2187 | 2120 | 2015 |
| Number of participants who answered at least one of the two questions about suicidal thinking | 2601 | 1847 | 2097 | 1495 | 2168 | 2114 | 1981 |
| % coded for suicidal thinking | 97.2 | 96.8 | 98.8 | 97.8 | 99.1 | 99.7 | 98.3 |
| Age (years) | | | | | | | |
| ≤12 | 10.2 | 9.8 | 11.8 | 4.2 | 12.7 | 8.7 | 6.7 |
| 13 | 27.0 | 29.7 | 26.3 | 28.4 | 27.1 | 29.5 | 30.4 |
| 14 | 30.9 | 34.6 | 33.0 | 32.5 | 31.2 | 33.9 | 34.0 |
| ≥15 | 31.8 | 25.8 | 28.9 | 34.9 | 28.9 | 27.9 | 28.8 |
| Sex | | | | | | | |
| Female | 50.0 | 51.8 | 50.8 | 48.5 | 53.7 | 48.8 | 58.3 |
| Male | 50.0 | 48.2 | 49.2 | 51.5 | 46.3 | 51.2 | 41.7 |
| Grade | | | | | | | |
| 7 | 32.7 | 32.6 | 33.7 | 32.2 | 33.3 | 36.8 | 32.6 |
| 8 | 32.4 | 34.0 | 31.8 | 35.2 | 33.8 | 33.5 | 33.6 |
| 9 | 34.8 | 33.4 | 34.5 | 32.6 | 32.8 | 29.7 | 33.8 |

UNRWA: United Nations Relief and Works Agency.

Table 2a
Percentage of Palestinian students reporting suicidal thinking.

| | Gaza Strip | West Bank | UNRWA Gaza | UNRWA Jordan | UNRWA Lebanon | UNRWA Syria | UNRWA West Bank | Pooled proportion (95% CI) | I ² | p-value |
|---|------------|-----------|------------|--------------|---------------|-------------|-----------------|----------------------------|----------------|---------|
| Ever seriously considered attempting suicide during the past 12 months | 19.3 | 23.7 | 18.5 | 21.7 | 14.6 | 21.3 | 21.5 | 19.9 (17.8, 22.2) | 90.93 | <0.001 |
| Made a plan during the past 12 months about how they would attempt suicide | 18.0 | 17.1 | 16.4 | 18.1 | 14.2 | 17.4 | 18.5 | 17.1 (16.0, 18.2) | 68.32 | 0.004 |
| Reported suicidal ideation and/or planning during the past 12 months | 25.9 | 28.5 | 24.7 | 27.0 | 19.9 | 26.8 | 27.2 | 25.6 (23.6, 27.8) | 88.36 | <0.001 |
| Percentage of students reporting suicidal ideation who also reported suicidal planning ^a | 60.0 | 53.5 | 55.4 | 59.9 | 61.1 | 55.7 | 60.3 | 58.0 (55.8, 60.2) | 86.67 | <0.001 |
| Percentage of students reporting suicidal planning who also reported suicidal ideation ^a | 63.3 | 72.0 | 61.9 | 71.0 | 63.0 | 67.9 | 69.5 | 67.0 (63.9, 70.0) | 93.47 | <0.001 |

CI: Confidence Interval; UNRWA: United Nations Relief and Works Agency.

^a These percentages include only students who answered both questions about suicide.**Table 2b**
Percentage of students in all other GSHS-participating countries in the Eastern Mediterranean region who reported suicidal thinking.

| | Palestinian GSHS 2010 (pooled) | Jordan 2007 | Tunisia 2008 | Kuwait 2011 | Morocco 2010 | Iraq 2012 | Lebanon 2011 | UAE 2005 |
|--|--------------------------------|-------------|--------------|-------------|--------------|-----------|--------------|----------|
| School participation rate (%) | – | 100 | 100 | 97 | 100 | 94 | 88 | 100 |
| Student participation rate within participating schools (%) | – | 99.8 | 83 | 88 | 92 | 94 | 99 | 91 |
| Overall GSHS participation rate (%) | – | 99.8 | 83 | 85 | 92 | 88 | 87 | 91 |
| Number of GSHS participants | 14,588 | 2197 | 2870 | 2672 | 2924 | 2038 | 2287 | 15,790 |
| Number answering at least one of the two suicidal thinking questions | 14,303 | 2132 | 2850 | 2657 | 2898 | 2008 | 2275 | 15,548 |
| % coded for suicidal thinking | 98.2 | 97.0 | 99.3 | 99.4 | 99.1 | 98.5 | 99.5 | 98.5 |
| Ever seriously considered attempting suicide during the past 12 months (%) | 19.9 | 18.0 | 20.8 | 14.0 | 16.7 | 17.6 | 15.2 | 13.0 |
| Made a plan during the past 12 months about how they would attempt suicide (%) | 17.1 | 18.1 | 13.9 | 19.9 | 14.9 | 16.5 | 11.6 | 9.8 |
| Reported suicidal ideation and/or planning during the past 12 months (%) | 25.6 | 23.7 | 23.2 | 22.7 | 22.6 | 22.0 | 18.5 | 15.6 |

GSHS: Global School-based Student Health Survey.

UAE: United Arab Emirates.

Table 3
Prevalence of self-reported suicidal ideation and/or planning in the past year, by age, sex, and grade.

| | Gaza Strip | West Bank | UNRWA Gaza | UNRWA Jordan | UNRWA Lebanon | UNRWA Syria | UNRWA West Bank | Pooled proportion (95% CI) |
|-------------------|------------|-----------|------------|--------------|------------------|--------------|-----------------|----------------------------|
| Total | 25.9 | 28.5 | 24.7 | 27.0 | 19.9 | 26.8 | 27.2 | 25.6 (23.6, 27.8) |
| Age (years) | | | | | | | | |
| ≤12 | 30.2 | 26.7 | 27.3 | 20.0 | 17.1 | 18.3 | 25.6 | 23.6 (19.5, 28.2) |
| 13 | 26.0 | 29.4 | 22.7 | 24.4 | 18.4 | 26.7 | 28.8 | 25.1 (22.3, 28.1) |
| 14 | 23.2 | 25.6 | 25.3 | 25.3 | 20.0 | 25.3 | 22.4 | 23.9 (22.3, 25.5) |
| ≥15 | 26.7 | 31.2 | 25.0 | 30.1 | 21.8 | 31.3 | 31.0 | 28.1 (25.5, 30.8) |
| p-value for trend | 0.434 | 0.457 | 0.998 | 0.010 | 0.064 | 0.003 | 0.388 | <0.001 |
| Sex | | | | | | | | |
| Female | 26.3 | 26.4 | 23.3 | 25.7 | 16.7 | 29.1 | 24.9 | 24.4 (21.5, 27.6) |
| Male | 25.3 | 30.4 | 26.3 | 27.4 | 23.0 | 24.4 | 30.1 | 26.6 (24.6, 28.7) |
| p-value | 0.570 | 0.058 | 0.120 | 0.471 | <0.001 | 0.015 | 0.012 | 0.001 |
| Grade | | | | | | | | |
| 7 | 27.6 | 29.1 | 25.2 | 24.6 | 21.3 | 24.9 | 29.5 | 25.9 (23.8, 28.3) |
| 8 | 23.7 | 28.0 | 26.6 | 27.8 | 20.6 | 25.2 | 22.3 | 24.8 (22.8, 26.9) |
| 9 | 25.6 | 28.0 | 22.5 | 27.8 | 17.5 | 30.2 | 30.0 | 25.8 (22.8, 29.1) |
| p-value for trend | 0.363 | 0.664 | 0.237 | 0.270 | 0.078 | 0.033 | 0.814 | <0.001 |

CI: Confidence Interval; UNRWA: United Nations Relief and Works Agency.

4. Discussion

This analysis found a high rate of suicidal ideation and planning among OPT adolescents and also identified numerous risk behaviors and other exposures that might be associated with suicidality. The rates of suicidal thinking among adolescents vary considerably by world region and by the definition of suicidality used in each study. For example, a study of adolescents (mean age 15 years) in 11 European countries found that about 4.2% had serious suicidal ideation or plans in the past 2 weeks [25], while studies of suicidal ideation not factoring in planning tend to be considerably higher:

8.8% in the past year among ages 13–15 years in Thailand [26], 14.1% among ages 11–15 in Brazil [27], 16.1% among ages 14–16 in Australia [28], and 23.3% among ages 12–17 in the United States [29]. Thus, the most helpful comparisons are ones from studies that use comparable definitions and methods.

It is therefore concerning that the rate of suicidal thinking in the Palestinian GSHS (25.6%) is not only higher than that found in most other studies of adolescents around the world, but is also higher than any other country in the Middle East that has participated in the GSHS (which had suicidal thinking rates ranging from 15.6% to 23.7%). The rate of suicidal thinking alone (19.9%), not including

Table 4
Percentage of students reporting various health behaviors and exposures.

| | Gaza Strip | West Bank | UNRWA Gaza | UNRWA Jordan | UNRWA Lebanon | UNRWA Syria | UNRWA West Bank | Pooled proportion (95% CI) |
|--|------------|-----------|------------|--------------|---------------|-------------|-----------------|----------------------------|
| Usually drank carbonated soft drinks one or more times per day during the past 30 days | 50.0 | 66.0 | 43.2 | 56.5 | 70.3 | 51.8 | 60.0 | 57.1 (49.8, 64.0) |
| Were bullied on one or more days during the past 30 days | 45.9 | 40.8 | 47.7 | 49.4 | 28.6 | 49.6 | 43.3 | 43.4 (38.0, 49) |
| Reported that their parents or guardians never or rarely understood their problems and worries during the past 30 days | 48.0 | 40.1 | 42.0 | 45.1 | 38.8 | 41.5 | 41.6 | 42.4 (40.0, 44.9) |
| Were physically attacked one or more times during the past 12 months | 45.5 | 37.5 | 33.8 | 48.5 | 31.4 | 46.8 | 40.5 | 40.4 (35.6, 45.4) |
| Were in a physical fight one or more times during the past 12 months | 40.3 | 45.4 | 39.1 | 41.3 | 30.9 | 42.4 | 37.7 | 39.5 (36.2, 42.9) |
| Reported that their parents or guardians never or rarely really knew what they were doing with their free time during the past 30 days | 38.4 | 31.2 | 38.0 | 41.1 | 38.5 | 33.7 | 39.3 | 37.1 (34.7, 39.6) |
| Missed classes or school without permission on one or more of the past 30 days | 38.9 | 32.9 | 37.6 | 40.0 | 23.6 | 35.3 | 35.9 | 34.7 (30.7, 38.9) |
| Reported that their parents or guardians never or rarely checked to see if their homework was done during the past 30 days | 34.9 | 31.7 | 34.5 | 34.8 | 28.1 | 33.4 | 30.3 | 32.5 (30.6, 34.5) |
| Reported most of the students in their school were never or rarely kind and helpful during the past 30 days | 29.7 | 32.9 | 25.6 | 29.4 | 21.5 | 23.5 | 22.4 | 26.2 (23.2, 29.5) |
| Used any tobacco in the past 30 days | 15.0 | 26.5 | 13.0 | 26.3 | 17.6 | 19.3 | 24.9 | 19.9 (16.1, 24.2) |
| Were so worried about something that they could not sleep at night most of the time or always during the past 12 months | 16.1 | 15.6 | 14.4 | 20.5 | 13.2 | 18.4 | 17.5 | 16.4 (14.7, 18.2) |
| Felt lonely most of the time or always during the past 12 months | 14.8 | 13.0 | 14.5 | 17.3 | 10.4 | 14.0 | 13.8 | 13.9 (12.5, 15.4) |
| Went hungry most of the time or always because there was not enough food in their home during the past 30 days | 11.2 | 8.8 | 7.6 | 8.3 | 5.1 | 4.8 | 7.9 | 7.4 (5.9, 9.3) |
| Have no close friends | 8.6 | 7.1 | 8.6 | 8.7 | 5.7 | 7.1 | 6.1 | 7.4 (6.5, 8.3) |
| Ever used marijuana | 3.1 | 4.0 | 3.3 | 3.8 | 3.0 | 2.1 | 4.1 | 3.3 (2.8, 3.9) |

CI: Confidence Interval; UNRWA: United Nations Relief and Works Agency.

Table 5
The odds ratio of the associations between various health behaviors and other exposures and self-reports of suicidal ideation and/or planning in the past year.

| Health behaviors or exposures | Gaza Strip | West Bank | UNRWA Gaza | UNRWA Jordan | UNRWA Lebanon | UNRWA Syria | UNRWA West Bank | Pooled OR (95% CI) |
|---|----------------|----------------|-----------------|----------------|-----------------|-----------------|-----------------|--------------------|
| Ever used marijuana | 3.6 (2.3, 5.8) | 4.0 (2.4, 6.5) | 6.3 (3.8, 10.7) | 5.1 (2.9, 9.1) | 6.2 (3.6, 10.6) | 7.2 (3.7, 14.1) | 4.5 (2.8, 7.2) | 4.9 (4.0, 6.0) |
| Had no close friends | 4.3 (3.2, 5.8) | 3.7 (2.5, 5.3) | 3.4 (2.5, 4.7) | 2.9 (2.0, 4.2) | 5.6 (3.8, 8.3) | 2.8 (2.0, 4.0) | 4.1 (2.8, 6.0) | 3.7 (3.1, 4.3) |
| Used any tobacco in the past month | 3.5 (2.8, 4.4) | 2.7 (2.1, 3.3) | 4.3 (3.3, 5.7) | 3.2 (2.5, 4.1) | 4.3 (3.4, 5.6) | 2.7 (2.2, 3.5) | 2.8 (2.2, 3.5) | 3.5 (3.0, 4.0) |
| Usually felt lonely during the past year | 2.2 (1.8, 2.8) | 3.6 (2.7, 4.8) | 3.4 (2.7, 4.4) | 3.2 (2.4, 4.3) | 2.4 (1.8, 3.3) | 4.1 (3.1, 5.2) | 3.4 (2.6, 4.4) | 3.3 (2.7, 3.9) |
| Usually could not sleep at night because of worry during the past year | 2.9 (2.3, 3.6) | 2.2 (1.7, 2.9) | 3.1 (2.4, 4.1) | 2.2 (1.7, 2.9) | 3.8 (2.9, 5.0) | 3.4 (2.7, 4.3) | 2.3 (1.8, 3.0) | 2.9 (2.5, 3.4) |
| Usually had too little food at home in the past month | 1.6 (1.3, 2.1) | 2.4 (1.7, 3.4) | 2.6 (1.9, 3.7) | 2.4 (1.7, 3.6) | 2.5 (1.6, 3.8) | 3.2 (2.1, 4.8) | 1.9 (1.4, 2.7) | 2.3 (1.9, 2.7) |
| Bullied in the past month | 2.1 (1.7, 2.5) | 2.2 (1.7, 2.7) | 1.7 (1.3, 2.0) | 2.1 (1.6, 2.6) | 2.4 (1.9, 3.0) | 1.6 (1.3, 1.9) | 1.9 (1.5, 2.3) | 2.0 (1.8, 2.2) |
| Felt classmates were usually not kind and helpful in the past month | 1.6 (1.3, 1.9) | 1.5 (1.2, 1.9) | 2.0 (1.6, 2.5) | 2.1 (1.6, 2.7) | 2.2 (1.7, 2.8) | 1.9 (1.5, 2.4) | 2.2 (1.7, 2.8) | 1.9 (1.7, 2.1) |
| Involved in a physical fight in the past year | 1.5 (1.3, 1.8) | 1.7 (1.4, 2.1) | 2.3 (1.9, 2.8) | 1.6 (1.3, 2.1) | 1.8 (1.4, 2.2) | 1.9 (1.6, 2.3) | 2.1 (1.7, 2.6) | 1.8 (1.6, 2.0) |
| Physically attacked in the past year | 1.9 (1.6, 2.3) | 2.1 (1.7, 2.6) | 1.9 (1.5, 2.3) | 1.6 (1.3, 2.0) | 1.7 (1.3, 2.1) | 1.4 (1.1, 1.7) | 2.1 (1.7, 2.6) | 1.8 (1.6, 2.0) |
| Missed school without permission in the past month | 1.5 (1.3, 1.8) | 1.9 (1.5, 2.3) | 1.6 (1.3, 2.0) | 1.7 (1.3, 2.2) | 2.0 (1.5, 2.5) | 1.6 (1.3, 2.0) | 1.5 (1.2, 1.9) | 1.6 (1.5, 1.8) |
| Parents usually did not check student's homework in the past month | 1.5 (1.3, 1.9) | 1.8 (1.4, 2.2) | 1.8 (1.5, 2.3) | 2.1 (1.6, 2.7) | 1.5 (1.2, 1.9) | 1.3 (1.1, 1.6) | 1.7 (1.3, 2.1) | 1.6 (1.4, 1.8) |
| Parents usually did not know about the student's free time activities in the past month | 1.7 (1.4, 2.0) | 1.7 (1.4, 2.2) | 1.6 (1.3, 2.0) | 1.7 (1.3, 2.1) | 1.6 (1.2, 1.9) | 1.6 (1.3, 1.9) | 1.3 (1.1, 1.6) | 1.6 (1.4, 1.7) |
| Felt parents usually did not understand problems or worries in the past month | 1.2 (0.9, 1.4) | 1.4 (1.1, 1.7) | 1.4 (1.2, 1.8) | 1.8 (1.4, 2.3) | 1.4 (1.2, 1.8) | 1.6 (1.3, 1.9) | 1.4 (1.2, 1.7) | 1.5 (1.4, 1.6) |
| Usually drank carbonated soft drinks daily in the past month | 0.8 (0.7, 0.9) | 0.9 (0.7, 1.1) | 1.1 (0.9, 1.4) | 1.0 (0.8, 1.3) | 1.2 (0.9, 1.5) | 1.4 (1.2, 1.8) | 1.5 (1.2, 1.8) | 1.1 (0.9, 1.3) |

CI: Confidence Interval; OR: Odds Ratio; UNRWA: United Nations Relief and Works Agency.

suicidal planning, is also much higher than the global GSHS average of 15.3% across 49 low- and middle-income countries and the country-specific rates reported for most GSHS-participating countries from around the world [30].

Based on the pooled analysis, male students in OPT have significantly higher suicidal thinking rates than females. This is

consistent with a study conducted among a representative sample of Palestinian students aged 11, 13, and 15 years in Gaza and the West Bank [31]. Other correlates of suicidal thinking in the OPT GSHS were related to mental health characteristics, tobacco and marijuana use, exposure to violence and victimization, and relationships with parents and peers. This set of possible correlates is

consistent with findings from other studies about adolescent suicidality in the OPT [31], the Eastern Mediterranean region [21,23], and other GSHS studies from around the world [32]. Use of substances such as tobacco and marijuana has been linked to suicidal behavior among adolescents [33]. Bullied adolescents may exhibit internalizing behaviors such as suicidal behavior as a result of distress [34]. Positive family relationships have been shown to reduce the likelihood of suicidal behavior among adolescents [35]. Family bonds are highly valued in Eastern Mediterranean cultures [36], which may make this relationship especially important for adolescent mental wellbeing in the region.

Limited access to diagnosis and treatment of mental health disorders may contribute to the high rate of suicidal thinking among Palestinian adolescents [32]. A study of general practitioner physicians in Gaza Strip found that 88% of cases of mental illness went undetected [37], so there is a critical need for additional specialists in psychiatry and psychology to be available for screening, diagnosis, and therapy. Additional barriers to care-seeking may stem from cultural and religious beliefs [38]. Many people living in the Middle East prefer to seek assistance from religious and traditional healers rather than from medical and mental health professionals [39]. Stigma associated with mental illness may also be a barrier to care seeking, even though Palestinian university students report more openness to professional mental health care than many of their regional peers [40].

The role of religion in mental health and wellbeing beyond mere utilization of mental health services merits further examination. Correlational studies of national-level data suggest that populations with a high proportion of Muslims have significantly lower male and female rates of death from suicide [41,42]. This relationship remains significant after adjusting for differences in socioeconomic status and income inequality [41], although it is also possible that death rates from suicide in countries where Islam is predominant may be underestimated due to intentional classification of suicide deaths as other types of injuries or as deaths from undetermined causes [43]. If Muslim youth are hesitant to report suicidal thinking because of religious taboos, the suicidal thinking rate may be even higher than that reported in the GSHS. Even if the rates of following through with self-harm are lower among Muslim youth than among adolescents in other religious traditions, serious repercussions can result from untreated depression and other mental health disorders.

Addressing mental health at the public health level requires considering the community factors that create an environment where so many adolescents have suicidal thinking. Palestinian refugees often have poor living conditions and are routinely exposed to various forms of political violence [10], and these factors may override the potentially protective benefits of religiosity [44]. A study of adolescents ages 15–18 in the Ramallah District of the West Bank showed that exposure to violence and trauma, both at the individual and the collective levels, was a strong predictor of symptoms of depression [45]. Similarly, a study of children ages 8–14 living in the OPT found that exposure to political violence was correlated with post-traumatic stress disorder (PTSD) [46].

There are several limitations to the GSHS that might affect the suicidality rate in participating countries. The survey only includes children attending school, and those who are not enrolled in school or who are absent due to illness are unable to have their perspectives included in the results. This might lead to an underestimate of the suicidal thinking rate. The GSHS is a self-report survey that is not validated with other assessments such as clinical examinations, and participants may not fully understand the level of severity implied in the two questions on suicidality. This might lead to an overestimate of the suicidal thinking rate, and it may explain the substantial proportion of students reporting suicidal planning but

not suicidal ideation. Also, the GSHS does not ask about the socioeconomic status of participants' households. Even so, this analysis reveals important information about the relatively low self-rated mental health status of Palestinian youth.

These GSHS results suggest a higher rate of suicidal thinking among Palestinian adolescents than in other countries in the region. These findings will need to be validated with longitudinal studies that can identify the risk factors associated with suicidal thinking and suicidal behavior. Because the GSHS uses a cross-sectional study design, it does not allow for evaluation of the possible causal associations between potential correlates and suicidal thinking. However, based on the GSHS analysis and other studies from the Eastern Mediterranean region, the factors likely to contribute to suicidal thinking in this population include poor mental health, drug use, victimization (being bullied or attacked), and a perception of limited parental understanding [31,47]. Once these correlates are verified, mental health promotion interventions tailored specifically to the adolescent Palestinian population can be designed, implemented, and evaluated. A recent review concluded that cognitive behavioral therapy is effective in reducing depressive symptoms and anxiety in adolescents [48]. Additionally, classroom-based didactic programs may offer a short-term improvement of knowledge about suicide prevention [48]. Although the GSHS survey does not ask adolescent participants about their use of the healthcare system, the results of this analysis suggest an unmet need for mental health care. The most effective interventions for youth exposed to ethnic-political and interpersonal violence and conflict may include not only individual-level psychiatric and psychological care [49], but also school-, family-, and community-level prevention programs [50].

In conclusion, the high rates of suicidal thinking among Palestinian adolescents living in OPT and UNRWA refugee camps, when compared both to GSHS results from other countries in the region and to published research on the topic, highlight the need for enhanced policies targeted toward improving the mental health of Palestinian adolescents. The health behaviors and other exposures identified in this study as correlated with suicidal thinking may provide insights into the types of interventions that might be helpful for improving mental wellbeing when implemented as part of comprehensive initiatives to raise awareness about suicide prevention.

Compliance with ethical standards

This study was not funded.

Conflict of interest

TI, AK, and KHJ confirm that they have no conflicts of interest.

Ethical approval

This was a secondary analysis of an anonymized publicly-available dataset.

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