adolescence (11 to 19 years of age) is characterized by rapid physiological, social and cognitive changes. Poor mental health during this period has been linked to mental health problems in adulthood. Worldwide, about 16% of adolescents suffer from mental health problems. In the United States, the direct cost of mental health services accounted for 69 billion US dollars, which represents 7.3% of total health spending. However, mental health promotion may help to prevent a wide range of health-damaging behavior as well as improving the quality of life of young people. In the United States, about 20% of children and adolescents are estimated to have mental health disorders. In Canada, 9.5% of boys and 12% of girls have mental health problems. Reports from India have estimated the prevalence of mental disorders from 2.6% to 35.6%. In the neighboring country of the United Arab Emirates, 22.2% of children aged 6 to 18 years were reported to have mental health problems. A large proportion of the population of Saudi Arabia is young, with 69% under 30 years old, and 47% under 15 years. However, there is a general paucity of research in the area of adolescent mental health. A recent study of boys in secondary school (age range from 15-18 years) in Abha city reported that more than one-third (38.2%) had depression, while 48.9% had anxiety and 35.5% had stress. Like other countries, adolescent girls in Saudi Arabia face rapidly changing challenges in their social and physical environment. Therefore, the purpose of this study was to estimate the prevalence of mental health symptoms among secondary school girls in Abha City in southwest Saudi Arabia and to assess related sociodemographic characteristics.

METHODS
This cross-sectional study was conducted during the 2006-2007 scholastic year in Abha. The subjects were girls in secondary school (representing the tenth, eleventh and twelfth years of general education in Saudi Arabia, which starts at 7 years of age). Abha is the capital city of the Aseer region in the southwest of Saudi Arabia, with a total population of 300000. In Saudi Arabia, schools for girls are segregated from boys. The city has a total of 10 secondary schools for girls,
original article

including 7 general schools and 3 Islamic (Tahfez Al-Quran) schools. All information about the study was provided to schools through the Abha School Health unit. All schools agreed to participate in the study. Field activities were conducted by trained fourth-year female medical students who were supervised by the staff of the Family and Community Medicine Department, College of Medicine, King Khalid University. Two classes were randomly selected from each school (first, second and third year).

The purpose of the study was explained to the participants in the classrooms. All students were clearly informed that they could choose not to participate. Subjects were assured of anonymity and confidentiality. All students in the selected classes during the study period were considered for inclusion in the study. Signed informed consent was given by each participant student.

The mental health questionnaire was based on the Arabic validated version of the Symptoms Check List 90-revised (SCL 90-R) questionnaire. This scale is used extensively to screen for mental health symptoms. The SCL 90-R test is a self-reporting instrument intended to measure severity of psychiatric symptoms on a number of different subscales. It contains 90 items and can be completed in just 12 to 15 minutes. Students rated the 90 symptoms of distress on a 5-step Likert-scale with 0 being 'not at all' and 4 being 'extremely'. Subjects were instructed to indicate the amount they were bothered by each of the symptoms during the preceding week. Relevant dimension scores were summed and the transformation of the scores was performed. The positive dimension was considered when relevant t scores were 61 or more. The test helps in measuring nine primary symptom dimensions and three global indices of distress. It is designed to provide an overview of symptoms and their intensity at a specific point in time. The dimension includes somatization (the process by which psychological needs are expressed in physical symptoms), obsessive-compulsive (a form of personality marked by obsessions and compulsions), interpersonal sensitivity (relating to a conflict in the relations and social exchanges between persons), depression (a mental state of depressed mood characterized by feelings of sadness, despair and discouragement), anxiety (the unpleasant emotional state consisting of psychophysiological responses to anticipation of unreal danger), hostility (tendency to feel anger toward and to seek to inflict harm upon a person or group), phobic anxiety (fear that is recognized as being excessive or unreasonable by the individual himself), paranoid ideation (persistent delusions of persecution or delusional jealousy and behaviour such as suspiciousness, mistrust and combativeness), and psychoticism (a person who will exhibit some qualities commonly found among psychotics such as disregard for common sense).

The three global indices are Global Severity Index (GSI), Positive Symptom Distress Index (PSDI) and Positive Symptom Total (PST). GSI is designed to measure overall psychological distress. PSDI is designed to measure the intensity of symptoms. The PST reports the number of self-reported symptoms.

Statistical analysis was conducted using the SPSS version 15. All tests were carried out at the 5% level of significance. A multivariate logistic regression analysis was used to identify potential sociodemographic risk factors that might affect mental symptoms. Adjusted odds ratio and concomitant 95% confidence intervals were calculated.

RESULTS

Five hundred and forty-five Saudi secondary school girls were included in the present study (Table 1). Their ages ranged from 14 to 19 years with a mean (SD) of 17.1 (1.1) years and a median of 17 years. Twenty students (3.7%) were married. Their ages ranged from 16 to 19 years. The majority (89.0%) of the study sample. Adjusted odds ratio and concomitant 95% confidence intervals were calculated.

Table 2 shows the overall prevalence of mental symptoms among adolescent secondary school girls. The least frequent mental symptoms were phobic anxiety (16.4%), psychoticism (14.8%) and anxiety (14.3%). The three global indices of distress. The positive global severity index (GSI) amounted to 16.3%, which indicates that at least one out of each of six girls suffers from one or more mental health symptoms. The...
Table 1. Sociodemographic characteristics of the secondary school girls.

| Age      | No | %  |
|----------|----|----|
| 14-15    | 22 | 4  |
| 16-17    | 333| 61.1|
| 18-19    | 190| 34.9|

| Marital status | No | %  |
|----------------|----|----|
| Married        | 20 | 3.7|
| Single         | 525| 96.3|

| Scholastic year | No | %  |
|-----------------|----|----|
| First year      | 219| 40.2|
| Second year     | 163| 29.9|
| Third year      | 163| 29.9|

| Type of study    | No | %  |
|------------------|----|----|
| Islamic (Tahfez Al-Quran) | 209| 38.3|
| General          | 336| 61.7|

| Parents’ status | No | %  |
|-----------------|----|----|
| Living together | 485| 89.0|
| Divorced        | 23 | 24.2|
| Separated       | 1  | 0.2|
| Deceased father | 28 | 5.1|
| Deceased mother | 5  | 0.9|
| Both parents are deceased | 3  | 0.6|

| Father’s education | No | %  |
|--------------------|----|----|
| Illiterate         | 43 | 7.9|
| Primary            | 87 | 16.0|
| Intermediate       | 93 | 17.1|
| Secondary          | 107| 19.6|
| University         | 149| 27.3|
| Postgraduate       | 66 | 12.1|

| Father’s employment | No | %  |
|---------------------|----|----|
| Unemployed          | 25 | 4.60|
| Military            | 89 | 16.3|
| Governmental employee | 162| 29.7|
| Private business    | 106| 19.5|
| Retired             | 163| 29.9|

| Mother’s education | No | %  |
|--------------------|----|----|
| Illiterate         | 154| 28.3|
| Primary            | 163| 29.9|
| Intermediate       | 88 | 16.1|

Table 1 (cont.). Sociodemographic characteristics of the secondary school girls.

| Scholastic year | No | %  |
|-----------------|----|----|
| Secondary       | 69 | 12.7|
| University      | 54 | 9.9 |
| Postgraduate    | 17 | 3.1 |

| Mother’s employment | No | %  |
|---------------------|----|----|
| Housewife           | 479| 87.9|
| Employed            | 66 | 12.1|

| Family size | No | %  |
|-------------|----|----|
| Less than 5 | 41 | 7.5 |
| 5-10        | 405| 74.3|
| More than 10| 99 | 18.2|
| Total       | 545| 100|

Table 2. Overall prevalencea of mental symptoms among secondary school girls in Abha, Saudi Arabia.

| Mental symptom                  | Prevalencea |
|---------------------------------|-------------|
| No                             | %           |
| Phobic anxiety                  | 90          | 16.5|
| Psychoticism                    | 80          | 14.7|
| Anxiety                         | 78          | 14.3|
| Somatization                    | 77          | 14.1|
| Depression                      | 76          | 13.9|
| Interpersonal sensitivity       | 75          | 13.8|
| Paranoid ideation               | 75          | 13.8|
| Hostility                       | 70          | 12.8|
| Obsessive-compulsive behavior   | 67          | 12.3|

aCategorization was based on “t” transformation of SCL R-90 scores. Positive dimension was considered when “t” scores are 61 or more.

aTotal is more than 100% as some students have more than one disorder (comorbidity)

Table 3. Positive global indices of distress among secondary school girls in Abha, Southwestern of Saudi Arabia (n= 545).a

| Positive global indices of distress | Prevalence (%) |
|------------------------------------|---------------|
| Global Severity Index (GSI)        | 16.3          |
| Positive Symptoms Distress Index (PSD)| 13.7        |
| Positive Symptoms Total (PST)      | 14.0          |

aCategorization was based on “t” Transformation of SCL R-90 scores. Positive dimension was considered when “t” scores are 61 or more.
positive symptoms distress index was 13.7% and positive symptoms total was 14.0%.

Table 4 shows multivariate logistic regression analysis of potential sociodemographic risk factors affecting the highest three prevalent mental symptoms: phobic anxiety, psychoticism and anxiety. None of the potential sociodemographic factors (age, type of school, marital status, family size, parental status, parental education and occupation and average of family income) were found to significantly affect the highest three prevalent dimensions of mental health. The same findings were present in the rest of the mental health dimensions.

**DISCUSSION**

Using a standardized instrument that assesses a broad range of mental health problems, we found that symptoms were prevalent among secondary school girls, with 16.3% suffering from one or more mental health symptoms.

In a previous study conducted on secondary school boys in the same area using Depression, Anxiety and Stress Scale (DASS) questionnaire, indicated that of 1723 Saudi adolescent school boys, 59.4% were found to have an anxiety disorder. Studies indicate that females have a higher prevalence of anxiety. On the other hand, the least frequent dimensions in this study were obsessive-compulsive (12.2%) and hostility (12.9%). In the UAE, Eapen et al reported that 7% and 9% of adolescents have phobia and anxiety, respectively.

The majority of students came from families that ranged in size from 5 to 10 persons, which is in agreement with the average Saudi family size reported in previous research. About two-thirds of mothers had either a primary education (29.9%) or were illiterate (28.3%). Unlike our finding, Brandon found that children whose mothers are employed were more likely to have emotional problems which can be secondary to the
differences. Average family income was less than 5000 SR in 21.8%. However, this did not significantly affect the nine dimensions of mental health. Neither did other potential sociodemographic risk factors (age, school type, marital status, family size, rank among brothers and sisters, parental status, parental education and occupation and average monthly family income (Table 4). A risk factor does not necessarily imply a direct causal relationship. It has been reported that emotional problems are most likely to be due an interaction between biological and environment factors.\(^4\) Integration of mental health into medical setting might improve care and reduce stigmatization of mental illness.\(^5\) Primary health care centers care offer a setting for the prevention and detection of mental health problems in adolescents. Further research is needed to determine the magnitude of psychiatric disorders at national level.

The questionnaire used in this study had the advantage of being psychometrically validated and developed in consideration of cross cultural and linguistic issues. However, this study has some limitations: it was restricted to female adolescents, which led to an inability to determine sex-specific psychopathology. Since it was a school-based study, it might miss adolescents in the community who do not attend schools. However, the results would reflect the state of psychopathology among adolescents.

In conclusion, the high prevalence of mental symptoms represents one of the major health problems affecting adolescents in Abha city. Further in-depth studies are needed to study mental disorders in the area and to identify potential supporting counseling and cognition-behavior therapy. In this context, a national program for mental health in this age group is crucial.

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