

An analysis of gender differences in self-reported health, use of medicines and access to information sources about medicines among adolescents

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Abstract: Adolescence is a key period in the emergence of gender differences in health that persist into adulthood. Knowledge about health-related gender differences among adolescents could be instrumental in informing policy and practice to effect health improvement among this age group. The main objectives of this study were therefore to investigate gender differences in self-reported health complaints and use of medicines during the preceding 3 months and access to information sources about medicines among adolescents in Malta. A self-administered questionnaire was distributed among adolescents attending secondary schools in Malta. A stratified random sample design generated a sample size of 514 students. Common health complaints, use of medicines, and sources of information about medicines were investigated by means of author-designed checklists. The analytical sample was formed from 474 usable questionnaires collected from students aged 14-16 years, of which 53.8% were females. In general, a female excess emerged for health complaints and use of medicines except for sport injuries and use of vitamins. Gender differences were statistically significant for a female excess in the retrieval of information from the package insert ($p < .001$), parents or adult relatives ($p < .01$) and friends or schoolmates ($p < .05$). The findings of this study underscore the need for awareness of gender differences in the health of adolescents among health care providers, policy makers, and educators. An important implication of the findings is that the health needs of adolescents could be more equitably addressed by adopting a holistic patient-oriented approach particular to the health needs of each individual.

Keywords: Adolescence, gender, health, pharmaceutical preparations, consumer health information

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INTRODUCTION

If one had to consider that the mortality during adolescence ranks lowest compared with other age groups, one could easily make the false assumption that adolescence represents a very healthy period in the life cycle of individuals (1). This period is, however, also characterized by increased stress and anxiety levels associated with

rapid physical changes, significant psychological development, and altered patterns of interpersonal relationships (2). A number of studies have shown that the prevalence of self-reported health complaints is actually high during this period, gradually increasing during the transition from beginning to mid-adolescence (3,4). In addition, this period is marked by an emerging or increasing

female excess in general ill-health, physical symptoms, and psychological distress.

The literature contains references to theories that have been posited to explain gender differences in the reporting of health complaints, including those pertaining to biological, cultural, and psychosocial mechanisms (5-7). Studies show that the excess morbidity experienced by females during adulthood is rooted in adolescence, a period during which the strengthening of already existing small excesses in morbidity is also known to occur (4). The implications are that gender differences during adolescence could possibly result in adverse effects in the quality of life during later stages in life in females, with possible negative outcomes for the quality of life of their families, as well as for productivity in the workplace. It is therefore necessary that the rather neglected area of research on gender differences in the experience of health problems during adolescence should be given its due importance. The knowledge thus gained would be of primary importance to better guide health-care practitioners to respond equitably to the health needs of both male and female adolescents during such a critical period in their development.

The literature reveals that the pattern of experience of self-reported health complaints among adolescents is closely followed by the pattern of medicine use among this age group. A higher prevalence of medicine use has been reported for adolescents, with a female excess emerging during the transition from early to mid-adolescence (8). The experience of health behaviors during adolescence tends to persist into adulthood, and patterns of medicine use during adolescence may therefore reflect the aspects of medicine use during later stages in life (9). Few studies have addressed gender differences in the use of medicines during adolescence (8). Further research in this

area is therefore needed to guide policy makers in planning and implementing appropriate health-promoting measures during the stage when gender differences in adulthood actually start to appear.

Although medicine consumption usually increases during adolescence, knowledge about medicines is lacking at this age with regard to certain important aspects of medicine use (10). The transition that occurs during adolescence from a family-centered to a broader environment subjects the individual to greater influences. Indeed, adolescents access a wide variety of sources to gain information about medicines. The information sources include the medicine package insert, family members, friends, pharmacists, family physicians, the media, and teachers. The literature shows that female adolescents are more knowledgeable about medicines than their male counterparts. The query emerges as to whether gender differences also exist in the use of information sources about medicines during adolescence. The knowledge gained with regard to this largely unexplored area of research would provide guidance to health policy makers and educators about how to maximize the accessibility of health-promoting measures, with the goal of achieving the greatest benefits for both male and female adolescents.

Taken together, a review of the literature reveals that although gender is an important dimension of social difference, differences in health in relation to this dimension have been under-researched (11). Adolescence is a key period in the emergence of gender differences in health. Therefore, the aim of the present study was to investigate health-related gender differences among adolescents in Malta to assist policy makers, healthcare providers, and educators in identifying areas that could be addressed to effect improvement

in the health of adolescents with subsequent positive outcomes during later stages in life.

The main objectives were to investigate gender differences among adolescents with regard to: 1) self-reported health complaints and 2) self-reported use of medicines, during the preceding three months; and 3) information sources about medicines that had been accessed.

METHODS

A self-administered questionnaire was distributed from March to May 2005 among 14-16 year-old adolescents attending their fourth year of secondary education in Junior Lyceum public schools, for which entrance is through a competitive exam. The total population of fourth-formers attending Junior Lyceums in Malta in 2005 was 1,808, representing 33.3% of the total adolescents in that age range in Malta. To estimate the number of students required to answer the questionnaire that would ensure statistical validity, we carried out a pilot study to determine the most sensitive question in the questionnaire. Taking this to have an expected value of 3.7% with a maximum admissible error of $\pm 1.5\%$, a sample of 455 students was predicted by Statcalc in Epi Info (Version 6), under the assumption of 95% confidence and 80% power.

The whole population of fourth-form Junior Lyceum students was stratified by gender and geographic area of residence; random sampling of whole classes generated a sample size of 514 students distributed over eight schools. After obtaining informed consent, the questionnaires, administered in Maltese, were answered anonymously by the students during regular class periods of approximately 30 minutes duration, under the supervision of the investigator and returned in sealed envelopes. Sociodemographic information was collected on gender,

month and year of birth, and area of residence. Social class variation was measured by means of a family affluence scale established by the World Health Organization (WHO) (12).

The data presented in this specific study, which formed part of a larger study, is restricted to the descriptive analysis of the following items: subjective health complaints, use of medicines, and sources of information about medicines. The students were asked to select from a checklist the health complaints they had experienced during the preceding 3-month period. This list was compiled by the authors after consulting published research investigating physical health complaints among adolescents (4,13). The health complaints included in this study were those of most relevance to the local scenario and for which over-the-counter medicines were available. The list consisted of ear problems/hay fever/cold/cough, headache, skin problems, gastrointestinal problems (indigestion/diarrhea/constipation), sport injuries, eye problems, and menstrual pain (females). The rationale behind the inclusion of hay fever and eye problems was the high prevalence of seasonal allergies and irritations associated with spring, the season during which the survey was conducted. In addition, the students were asked about the related use of medicines for the health complaints they had experienced and about their use of vitamins and antibiotics during the same preceding 3 months.

A further part of the questionnaire consisted of a checklist designed to investigate the sources of information about medicines that had been accessed by the adolescents. This checklist included the medicine package, parents/adult relatives, the community pharmacist, friends/schoolmates, radio, television, magazines, teachers, young

relatives, and the family physician. As Maltese adolescents do not receive any formal education about medicines, the authors believed it would have been unethical if the internet were to be included in the list. This avoided the possibility of any suggestive influence on the students' behavior, given that, in the absence of guidance, information on the internet is not always reliable and understandable. Instead, a free response question was designed to give the students the opportunity to list any other sources of information that had been accessed. This was followed by a closed-ended question inquiring whether the respondents wished to learn more about medicines.

The questionnaire, which had been originally drafted in English, was translated to Maltese and back-translated to English to check for congruency of meaning. Ethical approval for the study was obtained from the Ministry of Education and the Research Ethics Committee of the University of Malta. The questionnaire was pre-tested for clarity of meaning and relevance with a small number of students. In the original questionnaire, headaches and menstrual pain had not been listed separately but rather were included under a general term 'pain not caused by sports' in both the checklists for health complaints and the corresponding medicine use. During the pre-testing session, some females expressed their preference about having headaches and menstrual pain listed separately, given that they had suffered from both complaints during the preceding 3 months. The questionnaire was subsequently modified to reflect the students' suggestions.

The data were processed using PC90 (BMDP Statistical Software, 1990). The percentages of responses given by male and female students were calculated for each nominal category in the questionnaire. The

Pearson Chi square (χ^2) test was used to investigate gender differences in the experience of health complaints, medicine consumption, sources of medicines accessed, and a predisposition to be more knowledgeable about medicines. Because the participants did not consistently respond to every item on the questionnaire, there may be differences in the value of *n* (the total population of respondents), depending on the question. The level of statistical significance was taken at $p = .05$.

RESULTS

A total of 477 students were present on the days of data collection, and all returned the questionnaire. An analysis of the response from the collected forms yielded 474 usable forms. The age of the students ranged from 14 to 16 years (mean 15.22 years, $SD = 0.41$ years). A total of 255 students (53.8%) were females. Analysis of social class variation showed that 175 (37.1%), 254 (53.8%), and 43 (9.1%) students ($n = 472$), ranked low, medium, and high respectively according to the WHO family affluence scale (11).

A total of 207 (95.0%, $n = 218$) males and 252 females (98.8% of the total female population), reported health complaints during the preceding 3 months. The most common health problems experienced by both male and female adolescents were ear/hay fever/cold/cough problems followed by headaches (see table 1). The least common ailments were sport injuries for females and eye problems for males. Females reported a higher frequency for all health complaints except for sport injuries. Gender differences in the reported health complaints were statistically significant for skin problems, indigestion/diarrhea/constipation, headaches, and sport injuries.

A breakdown of the prevalence for medicine use for both male and female

Table 1. *Gender distribution for self-reported health complaints during the preceding 3 months*

Health complaint	Males n = 218	Females n = 255	Pearson χ^2	p value
	n (%)	n (%)		
Ear problems/hay fever/cold/cough	168 (77.1)	207 (81.2)	1.210	.27
Eye problems	19 (8.7)	36 (14.1)	3.338	.07
Skin problems	55 (25.2)	106 (41.6)	13.975	< .001
Indigestion/diarrhea/constipation	46 (21.1)	82 (32.2)	7.278	.007
Sport injuries	57 (26.1)	27 (10.6)	19.479	< .001
Headache	130 (59.6)	194 (76.1)	14.730	< .001
Menstrual pain	NA	152 (59.6)		

NA - not applicable

Table 2. *Gender distribution for self-reported medicine use during the preceding 3 months*

Type of medicine	Male n = 219	Female n = 255	Pearson χ^2	p value
	n (%)	n (%)		
For ear problems/hay fever/cold/cough	139 (63.5)	173 (67.8)	1.001	.32
Eye drops	15 (6.8)	28 (11.0)	2.437	.12
Vitamins	53 (24.2)	49 (19.2)	1.734	.19
Topical skin preparations	57 (26.0)	90 (35.3)	4.729	.03
Indigestion/diarrhea/constipation	32 (14.6)	44 (17.3)	0.611	.43
For sport injuries	58 (26.5)	21 (8.2)	28.249	< .001
Antibiotics	40 (18.3)	51 (20.0)	0.229	.63
For headache	119 (54.3)	165 (64.7)	5.273	.02
For menstrual pain	NA	70 (27.5)		

NA - not applicable

adolescents is illustrated in table 2. A total of 193 males and 235 females (88.1% and 92.2%, respectively) reported taking at least one medicine during the preceding three months. The most common medicine use reported by both genders was for ear problems/hay fever/cold/cough, followed by headache remedies. Medicines for sport injuries and eye drops were the least common medicines consumed by females and males, respectively. In general, more frequent use was made by females of all

types of medicines except for vitamins and medicines for sport injuries. Statistically significant gender differences were found for the frequency of use of medicines for skin problems, headaches, and sport injuries.

Both male and female adolescents reported a variety of sources of information about medicines (see table 3). Among the sources that had been mostly accessed were the family physician, pharmacist, parents or adult relatives, and the package insert. Teachers and relatives of the same age were

Table 3. Sources of information about medicines accessed

Source of information about medicines	Males n = 218	Females n = 255	Pearson χ^2	p value
	n (%)	n (%)		
Package insert	111 (50.9)	183 (71.8)	21.715	< .001
Parents/adult relatives	130 (59.6)	183 (71.8)	7.727	.005
Community pharmacist	142 (65.1)	179 (70.2)	1.379	.24
Friends/schoolmates	8 (3.7)	22 (8.6)	4.863	.03
Radio	19 (8.7)	16 (6.3)	1.022	.31
Television	45 (20.6)	37 (14.5)	3.084	.08
Magazines	16 (7.3)	24 (9.4)	0.652	.42
Teachers	13 (6.0)	8 (3.1)	2.212	.14
Young relatives	8 (3.7)	9 (3.5)	0.007	.94
Family physician	159 (72.9)	189 (74.1)	0.084	.77

not listed to the same extent. Female adolescents reported a higher frequency of access of information from the package insert, parents or adult relatives, a pharmacist, friends or schoolmates, magazines, and/or a family physician. Gender differences were statistically significant for a female excess in the retrieval of information from the package insert, parents or adult relatives, and from friends or schoolmates. In the free response question, two students (one male, one female) replied that they had used the internet to obtain information about medicines.

For the question enquiring about the predisposition of the study population to learn more about medicines, 63% of male respondents (n = 216) and 75.1% of female respondents (n = 253) reported in the affirmative. A statistically significant better predisposition was reported by females in this regard (Pearson $\chi^2 = 8.097$, p = .004).

DISCUSSION

With the exception of sport injuries, all health complaints were reported to a greater extent by female adolescents than by male adolescents in the study population. The

greater tendency for males to suffer from sport injuries may be related to the greater involvement of male adolescents in physical activity, as reported in the literature (14). Similarly, the overall significantly higher prevalence of health complaints among female adolescents has been reported in other countries (15). Several theories have been posited in an attempt to explain why such gender differences should occur. One reason why females report more symptoms may be attributed to their social conditioning during early childhood and gender-specific learned behaviors (7). For instance, whereas males are expected to display stoicism in response to pain from a very early age, females are allowed to express pain behavior more openly.

Research has shown that physical health complaints presented by males and females have received unequal evaluation by health-care providers who assume that females are healthier, although more emotive, with a tendency to have a worse perception of their health (16). Within this sex-stereotyped, gender-biased perspective underlies the risk that health complaints expressed by females are undervalued and discounted by health-

care providers. Contrasting explanations for the female excess in physical health complaints consider the importance of biological differences between the genders and the psychological stresses experienced by individuals within a milieu of social pressures and expectations (5,6). Riley and colleagues (17,18) demonstrated that females display a lower threshold and a lower tolerance for pain when compared with males, which may be partly accounted for by the physiological changes occurring throughout the menstrual cycle. In addition, gender-related differences have been shown to be at work in the neurotransmitter systems that are involved in pain modulation (6).

Sherwin (19) argues that physical health influences and is itself influenced by mental and social situations. The recognition that personal lives cannot be neatly fragmented into physical, social, and mental components suggests that the terms of social debate should be changed to recognize the complexity of human existence. Research among adolescents has shown that self-image, a psychosocial factor represented by self-esteem and weight-related worries, contributes significantly to a female excess in physical symptoms, including headache and stomach-ache (5). In addition, the greater importance attributed to physical appearance as a contributor to self-worth by female adolescents as compared with their male counterparts, may explain the greater prevalence of skin complaints reported by the female adolescents in this study (20).

In a critical review of the literature on gender variations in clinical pain experience, Unruh (21) reported that females have a greater tendency to respond to pain through health-related activities. This difference may in part explain the female excess for the overall use of medicines in this study, except for vitamins and medicines for sport injuries. These findings are consistent with

research carried out in other countries (8). Possibly, the greater tendency for female adolescents to engage in more health-related activities could be related to the greater frequency with which they reported health complaints, as evidenced by the overall consistency between the order of prevalence of intake of medicines and the order of prevalence of the reported relevant health complaints for each gender.

In addition, the female adolescents in this study showed a significantly greater predisposition to learn more about medicines than did male adolescents. This result is consistent with the findings of Greenfield and colleagues (22), who investigated gender differences in the attitudes of medical students toward learning about complementary and alternative medicine. Indeed, medicine-related information was accessed from healthcare providers and the package insert to a greater extent by the female adolescents as compared with the male adolescents in the study population. Possibly, this explains the higher score in knowledge of medicines obtained by female adolescents in a study conducted by the authors on the same study population (10).

Culture and socialization may further account for the gender difference in the pattern of access of medicine-related information. In a study on gender differences in coping with life stressful events, Thoits (23) reported that compared with males, females adopted more social support and expressive strategies. This finding may contribute to explain the significantly greater access by female adolescents of medicine-related information from parents, as reported in other studies that investigated gender differences in the access of health-related information (24). Given the teratogenic effects of some medicines, information obtained from friends or schoolmates that

may not always be accurate poses such a possible health risk for females who are entering their reproductive years.

The literature shows that adolescents are willing to discuss health-related topics with healthcare providers, but relatively few report that they have had such interactions (24). This finding, in addition to the more positive attitude to obtaining information about medicines that has been shown by female adolescents, underscores the requirement for sensitivity among health-care providers toward gender differences in health needs and health-information seeking activities during adolescence.

The present study has strengths and limitations. A major strength of this study is that the socioeconomic status and gender distribution of the students were consistent with national data (11,25). This similarity indicates that the findings in this study are more likely to be representative of the whole population of 15 year-olds in Malta. One other strength of the study is that because self-reported health complaints are based on perceptions of health, such complaints may have a more direct bearing on medicine-seeking behavior during adolescence than health indicators based on medical records or medical statistics.

The study also had limitations. The use of self-reported data relies on retrospective information to be submitted accurately and honestly by the participants. In addition, individual non-response studies could not be carried out with students who were absent from school on the days of data collection because of the requirement for anonymity; according to the information gathered from school records, the absence of these students could be attributed to sickness. Nevertheless, considering that almost 93% of the enrolled selected population was present, it is probable that the present data may only slightly mis-

represent the use of medicines by Maltese adolescents.

IMPLICATIONS

This study found gender differences among adolescents in the patterns of reporting of health complaints, the use of medicines, and access to information sources about medicines, with a general female excess in each area investigated. This finding is consistent with the available literature, which offers various explanations for the observed gender differences. A number of important implications arise from the findings of this study.

In the first instance, the results suggest that the adoption by healthcare providers of a holistic patient-oriented approach that departs from cultural stereotypes and the traditional disease-targeted approach could be more appropriate to respond equitably to the particular needs of both male and female adolescents during a period in which heightened self-consciousness about rapid physical changes could lead to lack of confidence in seeking advice from adults. Thus, further studies are required to investigate the attitudes and level of awareness among healthcare providers of gender differences in the health of adolescents. The findings from these studies would contribute to identifying and redressing the lacunae that may exist in health-provider training programs in relation to the acquisition of the skills required in healthcare provision that is sensitive to the specific needs of male and female adolescents during the critical period of transition into adulthood.

The results also suggest the need for further research designed to investigate the possible association of particular life circumstances with gender differences in the experience of health complaints and medicine use during adolescence. The results

would possibly guide policymakers to apply appropriate intervention strategies that could contribute to close the gap of gender disparities in the health of adolescents.

In addition, the setting up of school health-education programs would provide the opportunity for adolescents to direct their questions about medicines to knowledgeable informants about medicines, thus probably decreasing the need for access of information from friends or schoolmates, a practice that is significantly more common among female adolescents.

Giving importance to gender issues in the provision of healthcare for adolescents could lead to interventions that would effect improvement in the physical and psychological well-being of female adolescents. Given that an adult excess in female morbidity emerges during the period of adolescence, such measures could prove beneficial to the quality of life of females during later stages in life with possible positive outcomes for their families as well as for the future development of society and its economy.

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