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Self-efficacy and medicine use for headache among adolescents in Italy: results from the Italian HBSC 2010 study

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This article aims first to investigate gender patterns in medicine use, and corresponding headache complaints, in Italian adolescents; second, to examine the association between self-efficacy and medicine use for headache. This study used data from 23,941 15-year-old students participating in the 2009/2010 Health Behavior in School-aged Children (HBSC) Survey. Self-complete questionnaires devised by the HBSC international group were administered in classrooms. Logistic regression models (controlling demographics: age, gender, and FAS) were used to investigate the association between medicine use for the associated health complaint, and perceived self-efficacy. Overall, prevalence of students reporting medicine use for headache (at least once a month) was 40.1%. Medicine use was significantly more common among girls than among boys for that somatic symptom. The use of medicines was significantly associated with the frequency of the corresponding health complaint. Self-efficacy was associated with a lower use of medicine for headache just for the group with low frequency of headache. In conclusion, self-efficacy may reduce the tendency to use medicines when adolescents report infrequent headaches.

Keywords: medicine-use; headache; self-efficacy; adolescence; health

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Introduction

Medicine use for several health complaints is common among adolescents all over the world with the prevalence of use varying with the type of symptom and across age and gender groups (Hansen, Holstein, Due, & Currie, 2003). Medicine use for headache seems to be a quite common behavior among 15-year-old adolescents, who experience high levels of autonomy in choosing their use of medicines (Gobina et al., 2011; Hämeen-Anttila & Bush, 2008). Young people's medicine use should be addressed in public health policies, because of the harmful side-effects (e.g. hepatotoxicity (Sweetman, 2004), gastrointestinal bleeding, medication-overuse headache (Diener & Limmroth, 2004)), frequently occurring in children's development in case of misuse outside a formal therapeutic indication. Uncontrolled use of medicines has been associated with several problems, such as suicide attempts, high levels of depression, binge drinking, and smoking (Andersen, Holstein, & Hansen, 2006). Others studies suggest that using medicines for common health problems (e.g. headache) in adolescents predicts medicine use in young adulthood, confirming the importance of a better understanding of such behavior in

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adolescence (Andersen, Holstein, Due, & Hansen, 2009). The pattern of medicine use is consistent across countries and is congruent in reporting a more widespread use among girls than boys (Cavallo et al., 2006; Piccinini, Vieno, & Santinello, 2011), and an increase of use by age (Due, Hansen, Merlo, Andersen, & Holstein, 2007). Furthermore, several research studies suggest that the use of medicines may represent a general coping strategy for the adolescents to deal with stressors and not only a strategy to alleviate ailments (Allotey, Reidpath, & Elisha, 2004; Andersen et al., 2006; Hansen DL, Hansen EH, & Holstein, 2008). Because of the documented high consumption of medicines without a corresponding frequency in reported symptoms (Koushede & Holstein, 2009), we found pain management an important issue in adolescence, in order to have a deeper understanding of the possible protective factors against medicine misuse. Some studies have shown that self-efficacy may play a positive role in coping with pain and different types of health problems (e.g. diabetes, neuromuscular disorder), by increasing the probability to effectively manage pain and disease, and engaging in health behaviors and physical activities (Cramm, Strating, Roebroeck, & Nieboer, 2013; Leganger, Kraft, & Røysamb, 2000). Kouschede and Holstein found that Danish adolescents with high sense of coherence (that is, the capacity to use an appropriate variety of coping strategies) are less likely to deal with headache using medicines than peers with low self-efficacy and control (Kouschede et al., 2009). These observations suggest that similar personal factors may reduce the tendency to use medicines and to experience pain (Torsheim, Aaroe, & Wold, 2001).

In this study, we focus on adolescents' medicine use for headache because that symptom is recognized as the most frequent neurological symptom in childhood and adolescence, with 60% of children and adolescents reporting this symptom across the world (Gini, Pozzoli, Lenzi, & Vieno, 2014). In Italy, headaches and the corresponding medicine consumption are widespread among school-age population: the prevalence of headache varies from about 30% among boys to about 60% among girls and about 43% of young people reported to use medicines for that symptom (Gobina, Villberg, & Villerusa et al., 2014). Given the importance of this common phenomenon, knowledge about the mechanism and the protective factors involved in medicine use among adolescents is important but under-researched. The current article aims at examining gender patterns in medicine use for headache and the corresponding health complaint in Italian adolescents. The second objective of this study is to evaluate the association between self-efficacy and medicine use for headache for the associated somatic symptoms in a representative sample of Italian students. We expect somatic symptoms to be positively associated with medicine use for headache and self-efficacy to be negatively associated with medicine use.

Methods

Design and sample

This article presents recent data in medicine use and health complaints, reported by 15-year-old adolescents from all Italian regions. The study was conducted with samples of Italian secondary school students drawn from the 2010 survey of the 'Health Behaviour in School-aged Children' (HBSC) project, a transnational study conducted every four years and carried out in collaboration with the European office of the World Health Organization (Lazzeri, Giacchi, Dalmasso et al., 2013). Data were collected via self-report questionnaires during a regular school day. Participation in the survey was voluntary, with assurances provided in relation to confidentiality and anonymity of their answers.

Informed consent was obtained to allow students to participate in the study. According to the HBSC protocol, cluster sampling was used. The schools were randomly selected from the National School Office's database of all public schools. Specifically, 1121 secondary schools were randomly selected from the total number (25,899) of secondary schools in Italy. Then, one class for each age group (11, 13, and 15) was selected randomly in each school. Further details of study's methods and development can be found elsewhere (Vieno, Lenzi, Santinello, & Cavallo, 2013).

The research protocol included three age groups: 11-, 13-, and 15-year-olds corresponding to the 6th, 8th, and 10th grade (first and third grade of Italian middle school, and second grade of Italian secondary school). These analyses focus on data collected among 15-year-old students in Italian schools because the HBSC research protocol does not include the questions on medicine use for younger age groups (Gobina et al., 2014).

The questionnaire was completed in the variables of interest by a total of 23,941 Italian adolescents (mean age 15.7 years, SD = 0.67; 50.1% girls).

The research was conducted in accordance with the ethical guidelines established by the American Psychological Association.

Measurements

Data were collected through a self-report questionnaire, devised by the HBSC international group that focuses on health behaviors of adolescents. All questionnaire items were developed first in English and subsequently translated in Italian and re-translated in English, with careful checking for consistency at the international coordinating center. In this study, we consider the following variables: medicine use for headache and the corresponding health complaint, and self-efficacy.

Medicine use was assessed through the question 'During the past month, have you taken any medicine for the following: headache'. Responses were: 'no', 'yes, once' and 'yes, more than once'. They were dichotomized into 'yes' and 'no' for these analyses.

Headache during the previous six months was measured using the HBSC symptoms checklist (Ravens-Sieberer et al., 2009). The frequency of health complaints responses were: 'about every day', 'more than once a week', 'about every week', 'about every month', 'rarely or never. According to Gobina and collegues (2011), these five options were grouped into three levels: 'rarely or never' (1), 'monthly' (2), and 'weekly' (3) (about every day, more than once a week, about every week).

Students' self-efficacy was assessed by a ten-item scale (General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995)). For example, included items were: 'I can always manage to solve difficult problems if I try hard enough' and 'When I'm confronted with a problem, I can find several solutions'. Responses were rated on a four-point scale (1 = not at all true to 4 = exactly true).

Alpha reliability for the ten-item scale was 0.81. Responses for the measure of self-efficacy were averaged.

Demographics (sex, age, and family affluence scale (FAS)) were introduced as control variables. The FAS is a four-item measure developed and validated in the HBSC protocol (Boyce, Torsheim, Currie, & Zambon, 2006). It includes four indicators of family affluence: family car ownership, unshared rooms, number of computers at home, and time spent on holiday in the 12 months preceding the survey. Responses were summed and the total scores (ranging from 0 to 9) were grouped into three categories: 'low-affluence' (scoring 0–2), 'moderate-affluence' (scoring 3–5), 'high-affluence' (scoring 6–9). Age was treated as a continuous variable.

Statistical analysis

Statistical analysis included the prevalence of medicine use for headache and of the corresponding headache complaint; comparison by gender was done using the χ^2 test. To compare the means of self-efficacy for boys and girls, analysis of variance (Anova) was used.

Logistic regression analysis was carried out, to investigate the association between medicine use for headache and self-efficacy. The regression model was tested using as dependent variable the use of medicines for headache. Independent variables were headache frequency, self-efficacy and, the two-way interaction 'headache frequency*self-efficacy'. The regression analysis was conducted controlling for the effect of the confounding factors (age, sex, FAS). A significance level of 0.05 was adopted. Data analyses were undertaken with SPSS version 21.

Results

Descriptive statistics

Medicine use for headache is very common among Italian adolescents who report frequent health complaints. Table 1 reports the prevalence of medicine use for headache and the frequency of headaches by gender. Overall, prevalence of students reporting medicine use for headache in the last month was 40.1%. Significantly more girls than boys used medicines for headache ($\chi^2 = 459.87$, $p < 0.001$). This gender pattern was observed also for the corresponding somatic symptom (headache), with the higher prevalence of weekly health complaints among girls (Table 1).

Regarding the perceived self-efficacy among Italian 15-year-old students, results show a significant difference between the mean of self-efficacy for boys ($M = 2.93$; SD = 0.45) and for girls ($M = 2.77$; DS = 0.46) [$t(23{,}815) = 26.05$; $p < 0.001$].

Findings of the logistic regression analyses

Results obtained from the logistic regression analysis (Table 2) show the association between frequency of headache, medicine use for health complaints and perceived self-efficacy by the three levels of experienced headache. As expected, among Italian adolescents, the use of medicines significantly increases with the frequency of reported headaches. The analysis showed a non-significant association between self-efficacy per se and medicine use for headache. On the other hand, interaction results show that self-efficacy played a protective role against medicine use for headache only for students reporting rare symptoms. The effect of self-efficacy was not statistically significant to explain the use of medicines for students reporting frequent headaches. Control for the other confounder variables is shown in Table 2.

Table 1.   Prevalence of medicine use for headache complaints by gender.

	Boys % (N)	Girls % (N)	total	χ^2	p
Medicines for headache					
No	66.2 (7397)	52.1 (5888)	59.1 (13,285)	459.87	<0.001
Yes	33.8 (3785)	47.9 (5416)	40.1 (9201)		
Headache					
Rarely or never	42.5 (5045)	22.0 (2634)	32.2 (7679)		
Monthly	27.4 (3253)	21.4 (2556)	24.4 (5809)	1829.6	<0.001
Weekly	30.1 (3570)	56.6 (6768)	43.4 (10,338)		

Table 2. OR (95% CI) for medicine use for headache and stomach-ache.

	OR	95%CI	p
Medicines for headache			
Headache frequency			
Weekly	1		
Monthly	0.48	0.31–0.75	0.001
Rarely or never	0.26	0.16–0.42	0.000
Self-efficacy[#]	1.04	0.95–1.13	0.421
Self-efficacy by headache frequency			
SE by weekly headache	1		
SE by monthly headache	1.04	0.89–1.22	0.602
SE by rarely or never headache	0.79	0.67–0.93	0.004
Gender			
Female	1		
Male	0.80	0.75–0.85	0.000
Age[#]	1.23	1.17–1.28	0.000
FAS			
High	1		
Moderate	0.89	0.84–0.95	0.000
Low	0.84	0.76–0.93	0.001

Note: [#]variable treated as continuous.

Discussion

The use of medicines among Italian adolescents is quite diffused but under-researched. This study contributes to add epidemiological evidence on the wide use of medicines for headache among Italian adolescents. Results obtained from the 2010 HBSC international study indicated that almost half of European and US 15-year-old adolescents use medicines for headache, placing Italy on the average of use across countries, with high percentages of medicine use (40.1% for headache) (Gobina et al., 2014). As already suggested by the literature in the last decades, like European and US peers (Gobina et al., 2011), Italian girls reported more frequently this health complaint and medicine use than boys. This pattern has been explained by some authors (Benjet & Hernández-Guzmán, 2002; Cavallo et al., 2006) with the different experience of puberty for male and female. The higher risk for girls to perceive a poorer health could be explained with specific physical and psychological changes (Cavallo et al., 2006).

The first aim of the study was to examine adolescents' medicine use for headache for the corresponding health complaint in Italy. Although the distribution of medicine use and symptoms differed by gender, the association between frequency of symptoms and medicine use are shown in the same model, controlling for the gender effect. As discussed above, girls are more at risk to use medicines for headache than boys. Moreover, the model revealed that the frequency of headache significantly contributed to the variation in corresponding medicine use, obviously indicating that students reporting more frequent headaches are more likely to use medicines (Cavallo et al., 2006; Kouschede et al., 2009). This result contributes to confirm the validity of our data. Our findings indicate that the numbers of 15-year-old students reporting weekly and monthly headaches were higher than the numbers of adolescents using medicines during the past month (Table 1), suggesting that drugs consumption is not the only way for adolescents to deal with their pain. Family and primary health care support should help adolescents to find

alternative strategies for coping with stressful situations (Cantarero-Arévalo, Holstein, Andersen, Kristiansen, & Hansen, 2014; Cavallo et al., 2006; Vieno, Santinello, Pastore, & Perkins, 2007).

The second aim of this research was to investigate the role of self-efficacy in protecting from medicine use for headache. Results show that perceived self-efficacy was positively associated with lower students' medicine use for headache, but only for students with low frequency of headache. This result indicates that self-efficacy may have a valuable role, as an internal asset, in predicting health behaviors among adolescents. It suggests that increasing adolescents' appropriate self-confidence and resourcefulness may help adolescents to better cope with their symptoms when those are not frequent (Kouschede et al., 2009). The evidence that the interaction effect of self-efficacy and symptoms on medicine use decreased substantially by passing from weekly to rare headache indicates the importance for future research studies to investigate other possible factors associated with aches and medicine assumption. This study underscores the importance of promoting adolescents' skills in handling contingent pain and in interpreting physical symptoms, in order to cope with them as appropriately as possible (Gobina et al., 2011). As the knowledge of medicine use among Italian adolescents is poor but the levels of their autonomy in choosing to use medicines is high (Hansen et al., 2008), developing health education about medicine is an important issue (Piccinini et al., 2011).

The major strength of this study is the representative data on Italian 15-year-old students and the opportunity to examine an important protective factor for medicine use and complaints for headache. However, the present study has some limitations. First, the use of data from a self-report questionnaire may be influenced by recall bias and answer accuracy. It is important not to over-interpret these findings because willingness to respond accurately are liable to vary by national social norms about the interpretation of the concept of medicine use even if, according to Gobina's studies, self-reported medicine use provides a quite reliable and complete picture of this behavior (Gobina et al., 2011). Moreover, because of how the HBSC protocol is designed, we only have the measurement of physical symptoms by frequency instead of an intensity measurement. It would be interesting to analyze the association between severe ailments, self-efficacy and medicine use. A further limitation of the study is that measures of other adolescents' psychological problems related to headaches, such as adolescents' perception of stress and anxiety, were not available. Future studies should use a more comprehensive measure of aches and individual health perceptions to compare these findings. The extensive use of medicines in adolescence and its association with healthy lifestyles and individual characteristics suggest the importance of future research in this area in order to develop prevention programs on healthy adolescents' attitude about medicine, to strengthen their ability to cope with difficulties.

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A 💬 **Disclosure statement**

No potential conflict of interest was reported by the authors.

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