

# Attitudes Toward and Use of Over-The-Counter Medications among Teenagers: Evidence from an Italian Study

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## Abstract

In recent years, the consumption of Over-The-Counter (OTC) drugs has increased. Previous studies have pointed out that the OTC medications are misused and abused by teenagers, who often show poor knowledge of the toxicity of these drugs.

The paper aims to analyze the use of OTCs by teenagers and the factors that influence their consumption.

This paper is based on quantitative data. A web-based survey was administered to the students of an Italian high school. The questionnaire included queries on the knowledge, attitudes and practices of the students with regard to OTCs. Since teenagers are influenced by their families, their approach to healthcare was also investigated.

An exploratory factor analysis was conducted in order to determine the key factors influencing their attitudes toward the use of medications. Finally, a cluster analysis was run in order to identify different behavioral segments.

Results show that four factors (tradition, social communication, self-management, and caution) influence the attitudes and behaviors of teenagers toward OTC medicines. The research also highlighted that attitudes toward the use of OTC medicines varied among the respondents, who were grouped into three different clusters: their presence implies the need for targeted educational programs, involving teenagers and their families.

**Keywords:** Over-the-counter medications, self-medication, consumption, teenagers, cluster analysis, consumer behavior

## 1. Introduction

In recent years, the consumption of Over-The-Counter (OTC) medications, i.e., drugs that are sold without doctors' prescriptions, has increased. The switch from prescription to nonprescription status has generated benefits to patients, enabling them to take care of their minor ailments (Bond & Bradley, 1996; Cooper, 2013a; Cooper, 2013b; Vidourek, King, & Burbage, 2014) without professional consultations (Soller, 1998). Today, they are used to treat different health problems, ranging from cough and cold, to headache and dysmenorrhea.

Patients often perceive these drugs to be safer than prescription medicines (Bissell, Ward, & Noyce, 2001), but there is growing evidence concerning the potential for OTC medicines to cause harm, since they may be misused and abused (Ellen, Bone, & Stuart, 1998; Fingleton, Watson, Duncan, & Matheson, 2016). Abuse has been defined as the systematic overuse of non-prescription drugs, while misuse is the frequent use of drugs above recommended dose (Lessenger & Feinberg, 2008; Wazaify, Shields, Hughes, & McElnay, 2005).

Previous researches have reported harms derived from adverse effects of OTC medicines and cases of abuse, also among teenagers (Steinman, 2006; Levine, 2007; Ford, 2009; Morales-Suárez-Varela et al., 2009; Fouladbakhsh, Vallerand, & Jenuwine, 2012), who often take OTC medicines (Abel, Johnson, Waller, Abdalla, & Goldsmith, 2012; Hsiao, Jen-Ai, Huang, Shih-Ming, & Hsiang-Yin, 2006) without discussing the pharmaceutical products with their physicians (Burak & Damico, 2000).

Previous studies have focused their attention on the prevalence of—and the factors associated with—the misuse of OTC medicines, often with reference to specific groups, such as teenagers (Shi & Bayard, 2011), but scholars have underlined some “omissions,” concerning, for instance, the lack of methods that may be appropriate for exploring individual perspectives (Cooper, 2013a). Besides, there is a relative lack of literature relating to the

attitudes of the general population toward OTC medicines.

This paper builds on previous research by focusing on the OTC consumption by teenagers, not only on the abusers, and exploring their attitudes toward them and their sources of information. Indeed, without understanding teenagers' knowledge of drugs, attitudes and behaviors, effective educational programs are difficult to design.

Thus, the aim of the paper is to understand the factors influencing OTC use by teenagers, by focusing attention on their attitudes. The topic is explored with reference to their perceptions, but also in respect of their families' approach to healthcare. For teenagers, families are a relevant social group, and it is worthwhile to shed light on their approach. By defining the latent factors influencing the attitudes of teenagers, this paper sheds light on the presence of different clusters of teenagers, with different attitudes and characteristics.

## **2. Background**

### *2.1 The Decision-Making Process of Self-Medication with OTC Medicines*

Teenagers often use OTC medicines to take care of common ailments, but, as previously stated, there is growing evidence concerning cases of misuse and abuse (Fingleton et al., 2016; Bertoldi et al., 2014; Agley et al., 2015).

Effective self-medication requires that individuals are able to recognize the symptoms, decide to treat them (instead of adopting a "wait and see" approach, or adopting more information before deciding, Hunink et al., 2014) with the suitable OTC medicine. Moreover, they should be aware of the potential adverse effects and risks, and they should know when to seek advice from physicians (Calamusa et al., 2012).

It is, therefore, a decision-making process (Howard & Shet, 1969), based on individual knowledge and perception of the problem, attitudes and behaviors concerning health and treatment of illnesses. Scholars have pointed out that the decision-making process concerning the health of individuals is a complex process, since the most critical aspects are largely informative (Arrow, 1963). This process involves uncertainties and trade-offs (Hunink et al., 2014) and substantial physical and psychological risks (Jacoby & Kaplan, 1972).

However, OTC medicines are used to treat minor ailments. It can be argued, therefore, that individuals are more familiar with the illnesses that can be treated with these drugs, since these ailments are not an exceptional episode, and individuals can learn from their own experience or from that of others (Arrow 1963). Besides, OTC medicines are familiar to individuals: they may be advertised on mass media and are available not only in pharmacies, but, according to the market regulation of the country, also in retail outlets (Wazaify et al., 2005).

Thus, it can be argued that the decision-making process concerning the self-medication with OTC drugs is perceived as less risky than other decisions concerning health problems. But people need reliable information concerning OTC medicines to make appropriate decisions (Hayashi, Masuda, & Kimura, 2015). Therefore, the paper focuses on the sources of information used by teenagers and their influence on their attitudes toward OTC drugs.

### *2.2 Sources of Information*

In recent years, many studies have shown that the sources of information on OTC medicines are increasing, since there are not only the "traditional" ones—that is the health professionals (physicians and pharmacists)—but also advertising on mass media and information on the internet.

Previous research (Hsiao et al., 2009; Calamusa et al., 2012) pointed out that individuals have positive attitudes toward the consultation of doctors and pharmacists. Indeed, teenagers show high levels of trust in them and they are considered among the most reliable sources of information.

With reference to mass media communication concerning OTC medicines, particular attention has been devoted to advertising. Advertising in mass media is an influential source of information, which may affect the consumer decision-making process concerning the purchase and use of OTC medicines (Calamusa et al., 2012). Previous studies have revealed that students notice advertisements for medicines and that there is significant correlation between exposition to the ads and the number of pharmaceutical products used (Burak & Damico, 1999).

Eventually, some scholars (Borzekowski & Rickert, 2001; Henderson, Keogh, Rosser, & Eccleston, 2013) have hypothesized that the internet is an easy way to look for health information, since it has increased the availability of and access to information—through dedicated websites, forums, and social networks—where individuals may discuss health problems. Indeed, previous studies have pointed out that teenagers use the internet to access health information on a range of different topics (Borzekowski & Rickert, 2001; Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005).

In this research all these sources of information were investigated.

### *2.3 The Influence of the Social Groups*

Apart from the previous sources of information, there are also the personal ones relating to the social groups the teenagers belong to. Previous studies have demonstrated that a family exerts a complex influence on the behaviors of its members (Cotte & Wood, 2004); in particular, parents influence their offspring (Moore, Wilkie, & Lutz, 2002).

According to previous researches, parents influence children by transmitting values, attitudes, their own information-seeking and decision-making behaviors, and behaviors (Childers & Rao, 1992), that offspring learn because their parents directly teach them and/or because they learn through observation of their parents' behaviors (Cotte & Wood, 2004; Pileggi, Mascaro, Bianco, & Pavia, 2015). Research points out that a family's methods of managing pain and illnesses are evident in teenagers' OTC use (Skarstein, Lagerløv, Kvarme, & Helseth, 2016), with particular reference to maternal behavior (Jensen et al., 2014).

However, some scholars have pointed out the relevance of the child's perception: it is the perception, and not the actual behavior of the family, that influences the attitudes of offspring (Moore-Shay & Berchmans, 1996). Therefore, this paper will focus on teenagers' perceptions of family style vis-à-vis health and use of medicines.

Teenagers, however, are in that phase of life wherein they are trying to develop their independence from the family, while the need to belong to a group of peers increases (Holmström, Bastholm-Rahmner, Bernsten, Röing, & Björkman, 2014). Teenagers consider significant the feeling of being appreciated by their peers (Skarstein et al., 2016): having positive relationships with friends contributes to their self-esteem and social position. With reference to health-related information-seeking and decision-making behaviors, it was observed that, for instance, girls ask each other for advice about effective relief of dysmenorrhea (Skarstein et al., 2016). Therefore, friends, too, can contribute to teenagers' health behavior and their influence is investigated in this study.

### *2.4 Segmentation*

Previous researches pointed out the relevance of different sources of information for teenagers, and the existence of various external influences on their attitudes and behaviors. Therefore, it seems worthwhile to identify the main factors influencing attitudes and behaviors of teenagers toward the health and the use of OTC medicines, and to segment the teenagers in accordance with them, and not only in accordance with socio-demographic variables (gender, age, income, etc.).

Market segmentation is a cornerstone of marketing strategy, also in pharmaceutical markets (Lerer, 2002), to develop a deeper knowledge of consumers (MacLennan & MacKenzie, 2000). By identifying homogeneous subgroups in heterogeneous markets, the segmentation process focuses on the examination of consumers' needs, attitudes and behaviors.

Therefore, the paper aims also to identify the main factors influencing the teenagers' attitudes and behaviors toward their health problems, and based on them, to profile the segments that can be depicted among these adolescents.

This is a valuable contribution of the paper, since many scholars (Levine, 2007; Spoth et al., 2008; Hsiao et al., 2009; Cooper, 2013a; Holmstrom et al., 2014; Gualano et al., 2015) have suggested the need for—and positive effects of—OTC medication education among teenagers, in order to prevent misuses and abuses. However, scholars have also pointed out that communication programs involve the analysis of audience demographic and psychological factors for effectively targeting them (Albrecht, 2010; Nargiso, Ballard, & Skeer, 2015) and an effective segmentation, based on attitudes and behaviors, still appears rather under-explored in previous contributions concerning the use of OTC medicines by teenagers.

### *2.5 Research Questions*

Previous research has shown that there are many possible options as sources of information, which may influence teenagers' knowledge and behavior.

Hence, the research questions of this paper are:

RQ1. Which are the sources of information that teenagers use to acquire knowledge about health and medicines?

RQ2 and RQ3. Based on their preference toward the sources of information, which are the latent factors influencing the attitudes of teenagers toward OTC medicines? Are teenagers different in their attitudes toward these drugs so that there are different segments?

### 3. Method

In 2012, a web-based survey was conducted in an Italian high school to observe the experiences of students with OTC medicines.

Students' experiences were assessed using a structured questionnaire. The items were defined on the basis of a literature review, with particular reference to previous studies of the Italian Institutes of Statistics (Censis, 2007; Istat, 2011). Besides, items from previous international studies were adapted to the Italian context. The questionnaire was validated by a group of experts, such as marketing scholars and OTC users.

The questionnaire was then shown to the teachers of the school, to share the methodology and the contents, and to receive their comments. The questionnaire was then revised and presented to the students, to also solicit their comments, with particular reference to the clarity, readability and user-friendliness of the survey.

The questionnaire consists of 43 items, aggregated in four sections, related to: Opinions on health, Information sources on drugs, Use of OTC medicines, and Teenagers' socio-demographic characteristics.

Experience and attitudes were measured with "rating" items (5-point Likert scale, with 1 being "strongly disagree" and 5 being "strongly agree") related to: perceived knowledge about the medicines they take, sources of information, and family attitudes toward the use of drugs.

In March 2012, the final version of the questionnaire was submitted online to the 300 students of the high school, using a specific website for online surveys. Students accessed an introductory page, which described the purpose of the study, and were reassured that their data would be kept private. Following this page, they could access the online questionnaire. The survey was closed at the end of May 2012. A total of 81 students participated. The response rate was low (27%), but higher than the average response rate for web-based survey without response incentive in similar contexts (19.8%, Sax, Gilmartin, & Bryant, 2003). 22 questionnaires were incomplete and were excluded. The final analysis was run on 59 questionnaires.

#### 3.1 Statistical Analysis

Descriptive statistics were calculated to observe the main characteristics of respondents and the most relevant differences among them.

In order to identify the main factors influencing students' attitude toward OTC medicines, an exploratory factor analysis was carried out on 15 items concerning OTC use, family attitudes and sources of information. Factor analysis is a well-known statistical method of dimensionality reduction, commonly used to identify few latent factors in a larger set of variables that correlate each other. Factors were extracted using the principal component method. The rationale of using this method is that principal component analysis permits to extract a set of uncorrelated factors. In this way, each of these latent factors are easier to be described, since each factor explains a part of the overall variability, which is not explained by the other ones. The number of factors was defined using the Kaiser's rule (eigenvalues > 1). The percentage of cumulative explained variance is 56%. To measure the appropriateness of factor analysis, Bartlett's sphericity test ( $p$ -value < 0.001) and the Keiser Meyer Olkin index (KMO = 0.555) were calculated, and concluded that even if the KMO result is fair, the significance of Bartlett's test suggests that the sample is appropriate for an exploratory factor analysis.

With the purpose of simplifying the structure of the factorial solution and make its interpretation easier, a varimax rotation was adopted. To check the internal reliability of each, we also calculated the Cronbach's alpha among items. To make a segmentation of students in the sample, a hierarchical agglomerative cluster analysis on the four factor scores of each respondent was performed, according to the Ward's minimum variance procedure. The number of clusters was decided after analyzing the dendrogram originating by the hierarchical cluster analysis. As a result, three clusters of students were identified.

Finally, the clusters were described in terms of socio-demographic characteristics, opinions on health, and actual behaviors.

### 4. Results

#### 4.1 Sample Characteristics

A total of 59 complete questionnaires were collected.

The respondents' characteristics are presented in Table 1.

Table 1. Characteristics of respondents

Socio-demographic characteristics		%
Gender	female	64.4
Age	17	45.8
	18	54.2
N. of family members	2	13.6
	3	36.2
	4	34.5
	5	12.1
	6	3.4
Mother's education level	< High School	11.9
	High School Diploma	49.2
	Bachelor's/Master's Degree/Postgraduate	38.9
Father's education level	< High School	18.6
	High School Diploma	47.5
	Bachelor's/Master's Degree/Postgraduate	33.9

The educational profile of parents is high, as 39% of mothers hold a Bachelor's or a Master's degree or have a postgraduate education (34% of fathers) and 49.2% have earned a high school diploma (47.5% of fathers).

Students report good health conditions (67.8% good or very good), but, in comparison, they are less calm (47.5% often or always) and satisfied with themselves (35.6% very satisfied).

In the last year, they faced different minor ailments: 71% headache (49% at least monthly), 92% cough and cold (28% at least monthly), 59% anxiety (33.9% at least monthly) and, in the case of 84% of the girls, dysmenorrhea.

While 71% of students took anti-inflammatory drugs (NSAIDs) in the previous year, 54% took cough syrup, and 44% fever reducers.

Again, 80% of the students disclose having at least an adequate knowledge about the medicines they take, but the last time they took them, 40% did not read the patient information leaflet, and 53% did not check the expiry dates.

In case of a minor ailment, 46% of the students resort to self-medication, but 29% seek advice from a parent.

The last time they self-medicated, 32% did not check the dosage and 63% the side effects and contraindications, because they were familiar with them.

The respondents are not fully aware of some risk areas, with particular reference to co-ingestion with alcohol (18%) and instructions for use (42% do not take the medicines on a full stomach, even if they need to be taken after food). Besides, 36% of the students take some medicines with them (particularly NSAIDs), but only 38% conserve them in the original box with the leaflet.

The students' self-evaluation of knowledge about the medicines they take, the most important sources of information, and the family approach toward health problems and medicines are presented in Table 2.

Table 2. Teenagers' self-evaluation of knowledge concerning used medicines, most relevant sources of information and family approach toward health problems

Variable	Very Low/Low	Average	High/Very High
Most relevant sources of information:			
General Practitioner	15.5%	13.8%	70.7%
Parents	15.3%	32.2%	52.5%
Pharmacist	37.3%	27.1%	35.6%
Other health services (clinic, Local Health Authorities, etc.)	55.9%	16.9%	27.1%
Emergency Department	55.9%	16.9%	27.1%
Internet	62.1%	25.9%	12.1%
Mass media	76.3%	16.9%	6.8%
Friends	88.1%	5.1%	6.8%
Family approach towards the use of medicines:			

	Seek advice from the General Practitioner	44.1%	23.7%	32.2%
	Self-medicate with a well-known drug	28.8%	25.4%	45.7%
	Self-medicate with natural therapy	72.9%	11.9%	15.3%
	Seek advice from the pharmacist	61.0%	22.0%	17.0%
	Wait & see	61.0%	25.4%	13.6%
	I usually seek information on health topics	72.9%	18.6	8.5%
Self-evaluation of knowledge about used medicines		18.6%	52.5%	28.8%

Source: Authors' elaboration.

52.5% of students report an adequate knowledge about the medicines they take, but about 19% disclose a very insufficient, or insufficient, knowledge.

The most relevant sources of information are the General Practitioner (84.5% of the evaluations are positive), parents (84.7%) and pharmacist (62.7%). The internet (38% of the evaluations are positive), mass media (23.7%) and friends (11.9%) are the less trusted sources.

The family resorts to self-medication with a well-known medicine as a primary strategy to face ailments (71.1% of the evaluations are positive); seeking advice from the General Practitioner then follows (55.9%).

These items were used to run the factor analysis.

#### 4.2 Factor Analysis and Segmentation

The results of the factor analysis are shown in Table 3.

Table 3. The results of the exploratory factor analysis.

	Explained Variance (%)	Cronbach's alpha	Factor loadings	Mean	Std. Dev.
Factor 1: Tradition and immediate treatment	16.2%	0.70			
Wait and see			-0.57	2.39	1.10
Source of information: General Practitioner			0.58	3.98	1.27
Source of information: Other health services			0.68	2.51	1.36
Source of information: Emergency Department			0.79	2.44	1.41
Factor 2: Social communication	15.2%	0.69			
Source of information: Friends			0.77	1.69	1.02
Source of information: Mass media			0.71	1.86	1.09
Source of information: Internet			0.72	2.16	1.18
Factor 3: Self-management	14.0%	0.66			
Seek advice from the pharmacist			0.81	2.47	1.22
Self-evaluation of knowledge about used medicines			0.63	3.19	0.96
Source of information: Parents			0.51	3.61	1.11
Source of information: Pharmacist			0.70	2.98	1.29
Factor 4: Caution	11.6%	0.51			
Seek advice from the General Practitioner			0.61	2.88	1.26
Self-medicate with a well-known drug			-0.76	3.27	1.27
Self-medicate with natural therapy			0.54	2.10	1.21
I usually seek information			0.52	1.90	1.23

Source: Authors' elaboration.

Factor 1 points out positive relationships with the variables "General Practitioner," "Emergency Department," "Pharmacist," and "Other health services" as sources of information; a negative one with the variable "Wait and see," concerning the family approach. Factor 1, therefore, recalls an immediate reaction to illness, by seeking advice from professionals. It reflects a "Traditional/immediate search for treatment." The four items unveil diverse mean values, ranging from 2.44 ("Source of information: Emergency Department") to a very positive

3.98 (“Source of information: General Practitioner”). The Cronbach’s Alpha for this factor is 0.7 and the factor loadings for each item are above 0.5, suggesting a good internal consistency.

Factor 2 highlights positive relationships with the variables “Friends,” “Mass media,” and “Web” as sources of information: it reflects, therefore, the relevance of “Social communication”. Also, in this case, the Cronbach’s Alpha for the factor is about 0.7 and the factor loadings for the items are above 0.7, suggesting the internal consistency of this factor. However, the mean values are low (from 1.69 to 2.16), suggesting that these items are not relevant for the teenagers.

Factor 3 is positively related to the variable “Family attitude toward the use of medicines: to seek advice from the pharmacist,” to both “Parents” and “Pharmacist” as sources of information, and a positive self-evaluation of knowledge concerning medicines. This factor recalls the “Self-management of healthcare and medicines,” without involving health services. The Cronbach’s Alpha for the factor is acceptable (0.66) and the factor loadings for the items are above 0.7, with the exception of two factors (“parents” and “self-evaluation of knowledge.”)

Factor 4 shows positive relationships with three variables reflecting the family approach (“I seek advice from the physician before taking medicines,” “Preferably taking care with natural therapy” and “Propensity for health information”) and a negative one with the variable “I self-medicate” as a family approach. It seems, therefore, related to “Caution.” In this case, the Cronbach’s Alpha for the factor is 0.5 and the factor loadings range from 0.52 to 0.7: it is fair, and it suggests the opportunity to increase, in the future, the sample.

The results of the explorative factor analysis have been used to cluster the respondents.

Table 4. The results of the cluster analysis

	Cluster 1	Cluster 2	Cluster 3
Factor 1: Tradition	--	++	-
Factor 2: Social communication	++	-	-
Factor 3: Self-management	-	-	+
Factor 4: Caution	+	+	--

Source: Authors’ elaboration

Three different clusters of teenagers were identified. These findings support the presence of heterogeneity among teenagers, with reference to their attitudes toward healthcare and use of medicines.

Cluster 1 shows a strong, positive relationship with Factor 2 “Social communication,” a strong, but negative, one with Factor 1 “traditional/immediate search for treatment,” a positive one with Factor 3 “self-management of healthcare and medicines” and a negative one with Factor 4 “caution.” Its components seem “unaware and careless.” This group is composed of 18 students, 61% of whom are males. It is the group where teenagers feel more calm and are full of energy (about 95%), and only 11% usually take medicines with them.

Cluster 2 points out a strong, positive, relationship with Factor 1 “Traditional/immediate search for treatment,” a positive one with Factor 4 “caution,” and negative ones with both Factor 2 “Social communication” and Factor 3 “self-management of healthcare and medicines.” The students of this cluster could be labeled “careful and aware.” 21 students (66.7% females) are grouped in this cluster. The teenagers in this group are the most satisfied with themselves (100%). Even if this group is the more careful about dosage, 14% did not check the dosage of medicines—because of their familiarity with them. They are also careful about the instructions for use (81%).

Cluster 3 shows a strong, negative relationship with Factor 4 “Caution,” a negative one with both Factor 1 “Traditional/immediate search for treatment” and Factor 2 “Social communication,” a positive one with Factor 3 “Self-management of healthcare and medicines.” Its components seem “self-confident when dealing with health and medicines.” Cluster 3 includes 20 students, 85% of whom are females. It is the group wherein students feel less calm (about 80%) and less satisfied (80%); 50% of the components of this group did not check the dosage of medicines, because of their familiarity with them. They are also careless with reference to the instructions for use: only 35% followed them. It is also the cluster wherein 60% of the components usually take medicines with them.

## 5. Discussion

The research revealed that teenagers seem to be familiar with OTC medicines, as noted by previous works (Gualano et al., 2015). They use them frequently: a portion of them resorts to self-medication, some take

medicines with them, while others reported that they did not need information because they knew the medicines well, from their prior use. This familiarity also seems connected to the frequency of minor ailments: it should be investigated if this attitude toward the use of OTC drugs is due to the pain (Lagerløv, Rosvold, Holager, & Helseth, 2016; Skarstein et al., 2016) or to the perceived safety of these drugs. Indeed, given the familiarity with the OTC medicines, the teenagers seem to underestimate the risks related to misuse. (e.g., do not take the medicines on a full stomach, even if they need to be taken after food), or adverse effects. Besides, the respondents to the survey evaluated their knowledge as adequate, but only 38.8% felt they had good, or very good, knowledge.

With reference to the first research question, the results point out that teenagers adopt a traditional approach in seeking advice. Their main sources of information on general health matters and on drug usage are the general practitioner, and their parents: it, therefore, seems that despite their search for independence, teenagers trust experts and parents more. It is somehow surprising that for teenagers parents are more relevant as sources of information than pharmacists. The possible explanations are that parents have been their caregivers all their lives and their illnesses have always been treated under their supervision and advice, and so they are used to rely on them. On the other hand, the pharmacist may not be perceived as a “neutral” source of information, or an easily approachable one. Other studies have pointed out that teenagers rarely searched the internet for information relating to OTC medicines. This is coherent with this research; what is more surprising is that the internet is a more relevant source of information than friends. Even if these aspects were not investigated, the lower trust in friends could be the result of the superior competence teenagers perceive in the contents available online, and the fact that, apparently, it could guarantee confidentiality.

With reference to the second research question, the research revealed the existence of four factors influencing the attitude of teenagers toward the OTC medicines, which had not previously reported in other studies. The four factors were “Traditional/immediate search for treatment”, “Social communication”, “Self-management of healthcare and medicines” and “Caution”. The first one is related to a proactive and careful attitude, which spurns the “wait and see” approach and makes people seek advice from the professionals. The second one highlights the relevance of the communication, related to mass media and friends. The third factor shows a certain degree of independence from the health services, coupled with a positive self-evaluation of knowledge. The last factor (“caution”) highlights a certain degree of apprehension in relation to the use of medicines.

With reference to the third research question, the study highlights that attitudes to medicines vary among the respondents, who were grouped in careful and aware, careless and unaware, and self-confident in dealing with medicines. Some differences also emerge among males and females, probably because of the relevance of dysmenorrhea, which draws the girls to use OTC drugs to relieve their pain.

The three clusters, in fact, have different attitudes toward the health and different behaviors. Teenagers of Cluster 1 seem untouched by the health topics and do not seek information about them, even if 11% of these respondents usually take medicines with them. Individuals belonging to Cluster 3 seem very familiar with the use of medicines, even in a risky way, since they are careless with references to the instructions for use: this attitude could be related to the higher presence of females, who are often drawn to use medicines to relieve the pain deriving from dysmenhorrea. The students of Cluster 2 seem to be aware and informed.

The study therefore confirms the results of previous works, while adding some new insights concerning the relevance of information sources, the factors at the base of the attitudes of teenagers, and the presence and characteristics of different segments.

However, the paper is based on 59 questionnaires, limited to a single Italian high school; this is a limitation in generalizing the results. Future research should improve this aspect, by also surveying students of different ages from technical institutes and vocational schools.

## 6. Conclusions

This paper aimed to ensure a better understanding of the attitudes of teenagers toward the use of OTC medicines. The study confirms the familiarity of teenagers with OTC medicines: these results support the need for health education among adolescents and that they become aware of the consequences of the misuse of OTC medicines.

The research points out the different relevance of general practitioners, parents, pharmacists, internet, friends, mass media, and other health services as sources of information for teenagers. These results suggest that effective educational programs should also involve their most relevant sources of information that is general practitioners (and the way they communicate with the teenagers about these topics) and parents.

Finally, four factors influencing the attitude of teenagers toward OTC medicines were identified and used to



segment them. This is a valuable contribution of the paper, since it may be argued that different groups of teenagers need different educational approaches, which should be designed in accordance with their different attitudes and behaviors as well as their level of knowledge.

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