ORIGINAL ARTICLE

Level of understanding of medical terms among italian students

Míra porozumění odborným lékařským termínům u italských studentů

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Summary

Problems related to medical treatment and health literacy are nowadays a considerable difficulty, particularly if awareness of them is low. There is still a lack of information about students' understanding of medical recommendations. The aim of this work was to determine the understanding of medical terms among Italian students and to find out if there is any relation between understanding and age, gender, education or parental occupation. The research was realized via questionnaires in the Marche region of Central Italy in 2015. Students were chosen at random from grammar schools, vocational schools and the local university. 387 completed questionnaires were subsequently evaluated. The level of understanding of medical terms among students was quite poor. Most of the terms included in the study were known to only a third of respondents on average. A significant link between the comprehension of medical terms and education level or parental occupation was observed, especially in the terms that are not commonly used. Nevertheless, no relation between knowledge of medical terms and gender was found. This topic, which requires attention, should be investigated because of correct implementation of preventive medicine programs.
Key words: medical terms • Italian students • correct use of medicine • risk

Souhrn

Otázka zdravotní gramotnosti a farmakoterapie se zdá být v současné době značným problémem, obzvláště pokud povědomí o lécích je nízké. Studií, které by se zabývaly touto problematikou u studentů, není mnoho. Cílem této práce bylo zjistit míru porozumění odborným medicínským termínům u italských studentů a stanovit případnou souvislost mezi znalostí těchto termínů a věkem, pohlavím, vzděláním a zaměstnáním rodičů respondentů. Průzkum se uskutečnil formou dotazníků v regionu Marky ve střední Itálii v roce 2015. Respondenti byli náhodně vybráni mezi studenty gymnázií, odborných učilišť a místní univerzity. Následně bylo vyhodnoceno 387 vyplněných dotazníků. Míra porozumění odborným termínům mezi studenty byla poměrně nízká. Většina odborných výrazů použitých ve studii byla známá průměrně pouze pro třetinu respondentů. Byl pozorován signifikantní vztah mezi porozuměním odborným termínům a stupněm vzdělání, resp. zaměstnáním rodičů, obzvláště u výrazů, které nejsou běžně používány. Souvislost mezi znalostí medicínských termínů a pohlavím avšak zjištěna nebyla. Toto téma, zasluhující si pozornost, by mělo být dále studováno především z důvodu správné implementace preventivních zdravotnických programů.
Klíčová slova: odborné lékařské termíny • italští studenti • správné užívání léků • rizika

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Introduction

It is well known that every drug can poison as well as cure, depending on the amount taken. Even if the rules of correct administration of medication are followed, many treatment risks exist which increase if they are not. There are also many complications of drug therapy caused by non-compliance, when many useless drugs are administered to the patient.

Currently, in highly developed countries, everybody takes some form of medicine at some time. There are also many patients with serious or chronic diseases who take

a large number of medications (polypharmacy); their risk of suffering from medical-related problems is possibly higher.

A large number of studies have focused on health literacy in adults[1–3], but there is still a lack of information about students' understanding of medical recommendations.

The Pharmaceutical Care Network of Europe stated that "A drug related problem is an event or circumstance involving drug therapy that actually or potentially interferes with desired health outcomes" [4]. In addition, WHO defined ADR (Adverse Drug Reaction) as a "response which is noxious and unintended, and which occurs at doses normally used in humans for the prophylaxis, diagnosis, or therapy of disease, or for the modification of physiological function" [5]. In the Directive 2010/84/EU this definition is amended to "noxious and unintended effects resulting not only from the authorized use of a medicinal product at normal doses, but also from medication errors and uses outside the term of the marketing authorization, including the misuse and abuse of the medicinal product" [6]. ADRs are affected by many important predisposing factors including extremes of age, polypharmacy, intercurrent disease and genetic factors. Mechanisms of reactions can be pharmaceutical, pharmacokinetic or pharmacodynamic[7].

Because medical related problems and health literacy are currently a considerable difficulty, particularly if awareness of them is low, we decided to focus this work on the understanding of medical terms. This paper might help to better evaluate the importance and the risk of the miscomprehension of information on drug use among high school and university students.

In the last two decades, many surveys have focused on health literacy (HL). In given definitions, HL is often related only to patients' reading and numeracy skills. But the WHO defines health literacy as "the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health" [8]. The potential effect of culture on the communication and understanding of health information should not be forgotten, especially in patients' ability to make a health-related decision based on available information[9, 10].

The aim of the presented work was to determine the understanding of 25 medical terms used in leaflets among Italian high school and university students in the Marche region in central Italy and to find out any possible relation between the understanding of these terms and age, gender, education or parental occupation.

Material and methods

A questionnaire was distributed among high school and university students in the Marche region of central Italy during the winter term 2014/2015. The study population was chosen at random from students of the University of Camerino, grammar schools and vocational schools in Camerino. Of the 400 questionnaires distributed, 387 completed questionnaires were evaluated (97%). Of the 387 respondents, 213 were women (55%), 171 men (44%)

and 3 persons (1%) who did not state their gender. The overwhelming majority of respondents were Italian (345 students, 89%). There were also 7 Greeks (2%), 4 Albanians (1%), 8 Romanians (2%), 2 Russians (1%), 1 Ukrainian (0%), 1 Pole (0%), 1 Czech (0%), 1 Tunisian (0%) and 16 students (4%) who did not complete the question about nationality. The average age of the study group was 18.9 years. Two thirds of respondents or 256 students (66%) were high school students. 131 (34%) were university students. The group of high school students was made up of 157 (61%) comprehensive school students and 99 (39%) vocational school students. The group of university students was made up of 65 (50%) pharmacy students, 33 (25%) law students, 29 (22%) nutritional biology students, (2%) 2 fitness students, 1 (1%) chemistry student and 1 (1%) political science student.

The questionnaire used was originally created by the University of Camerino.

The selection of medical terms (the official language of the leaflets) included in the questionnaire was derived from the analysis of the medical terms presented on leaflets of the most used OTC drugs in Italy, as it was published by the Italian Ministry of Health[11]. From the list provided by the Italian Ministry of Health, 24 highest frequency terms were chosen from a list of the most common words (official language) on 50 OTC package information leaflets (ATC groups: A01, A02, A03, A06, A07, A11, C05, D01, G01, M01, M02, N02, R01, R05).

The term "teratogenic" was added to the most commonly used terms, considering the possible damage from taking some medications during pregnancy. This risk is greater in the age groups interviewed, whether some drugs are taken without adequate precautions.

In the first part, social and demographic facts and parental occupation were examined and the second part focused on the knowledge of technical terms which are frequently used in patient information leaflets.

Twenty five terms were used, each with four possible answers explaining the term and a fifth answer which stated "do not know" in order to add value to the results. There was one correct answer for each question.

The questionnaires were filled in by the students during their classes. Completion of questionnaires was absolutely anonymous and voluntary. The results were processed using Microsoft Excel 2010. Chi-square Test was used to examine the relationship between the level of understanding of medical terms and gender, age, education or parental occupation.

Results

Results summarizing numbers and percentage of respondents who stated correct answers to each term are presented in Table 1.

In addition, we present statistical correlations based on the respondents' age, gender, education and family education. There was no significant difference between male and female, high school and university students, nor between parental occupation for the following terms: "erythema", "anuria", "anaphylaxis", "spasm", "analgesic" and "precautions".

There was the only one term where significantly more correct answers were given by female than male participants: "antiaggregant" (P < 0.05).

Frequently, significantly higher knowledge was demonstrated among university students when compared with high school students (P < 0.05). Moreover, among university students, pharmacy students gave significantly more right answers (P < 0.05). These findings are related to the following terms: "hematuria", "topical", "ophthalmic", "hyperkalemia", "asthenia", "parenteral", "dyspnea", "edema", "dyspepsia", "constipation", "antipyretic", "exanthema", "antiaggregant", "bradycardia", "excipient", "teratogenic", "interaction", "antalgic" and "posology".

There was also a significantly higher level of understanding of these terms in respondents whose parents are employed in the medical field (P < 0.05). These correlations were found for the following terms: "hematuria", "topical", "ophthalmic", "hyperkalemia", "asthenia", "antipyretic", "exanthema", "bradycardia", "teratogenic" and "interaction".

From the group of high school students, comprehensive school students understood the following terms far better than vocational school students (P < 0.05): "dyspnea", "antipyretic", "exanthema" and "posology".

Table 1. Correct answers of students

Medical term	Number of correct answers	% of correct answers
erythema	268	69
anuria	40	10
hematuria	89	23
topical	92	24
parenteral	77	20
ophthalmic	90	23
hyperkalemia	81	21
anaphylaxis	154	40
dyspnea	111	29
edema	111	29
asthenia	74	19
dyspepsia	49	13
constipation	127	33
antipyretic	122	32
exanthema	52	13
spasm	256	66
antiaggregant	89	23
bradycardia	102	26
excipient	114	30
teratogenic	60	15
interaction	69	18
antalgic	41	11
analgesic	253	65
posology	114	29
precautions	305	79

Discussion

Health literacy

The importance of appropriate comprehension of medical instruction is evident, particularly because many medical errors are caused by a limited HL level[12]. Low HL is related with poor self-management of chronic diseases, higher hospitalization rates and poorer health[13–15]. HL is also connected with an increase in emergency department visits and increased morbidity and mortality[16]. Also, adherence to health care recommendations and preventive strategies is more likely to be influenced by a patientes literacy level[9, 12].

To illustrate how extensive this issue is, 90 million adults in the United States have problems with understanding and following health care information[17, 18]. Furthermore, only 12% of the 228 million of adults making up the US population has the skills to manage their healthcare adequately[16].

In the study related to levels of HL and the shame associated with admitting lower reading ability, it was found that almost half of population may have low health literacy. More than half of respondents had never spoken of their reading difficulties with family members and 67% had never mentioned this problem to their spouses[19].

Conclusions regarding the possible relation between comprehension of medical terms and factors stated below are presented:

Age

The conclusion of our research is that there was no relation between the age of respondents and the level of understanding of medical terms. Although it was observed that older students generally displayed a better knowledge of medical terms, the most likely reason for this is probably due to higher education levels rather than the real age of students. An additional argument can be that our study did not contain a representative population sample: respondents were high school and university students (18–30 years old), so any possible generalization relating to the age of respondents could be misleading.

This result corresponds with other studies regarding health literacy in different study groups. Usually, literacy levels were connected with age in population samples. In one study where the participants were children aged 7–12 years, the Newest Vital Sign was used to evaluate their health literacy. It was found that children were able to complete this questionnaire in the same time and with the same distribution of results as adults. The only difficulty for children aged 7 was the question on calculating and percentage; something that is usually learned when the child is aged 9 or 10[20]. In numerous studies it was noted that the elderly (60+) have limited HL. The reason may be related to an important attribute of HL, mainly that reading ability declines with age[13, 19, 21].

Gender

In our questionnaire no relation between the gender of respondents and understanding of medical terms was observed, with one exception (the term "antiaggregant"). This finding is in accordance with many other researches.

On the other hand, in their study on shame and health literacy, Parikh and his team found that men were more likely to have poorer health literacy than women[19]. This conclusion can be affected by the different roles occupied by men and women in society. Men might feel under higher pressure to deal with the prejudice of being more self-sufficient and capable of managing a higher number situations on their own than women. The study from the Netherlands also observed that men are more likely to have lower levels of health literacy than women[22].

Education

It was observed that there is a significant correlation between education and better understanding of medical terms in our study as well as in others[23]. In our study, the high level of knowledge of some well-known expressions such as "precautions", "analgesic", "spasm" and "erythema" was highlighted. These terms were correctly defined by the majority of students. The term "anaphylaxis" was known by 40% of respondents. In these widely used expressions no significant difference between any groups of respondents was observed.

On the contrary, most medical terms included in this survey which are also used in medical practice were not known to the majority of respondents. Knowledge of these terms was obviously related to levels of education.

No relation to education and health literacy was found in the study carried out in Pakistan. Their questionnaire was oriented on basic knowledge on drug use related to indications, contraindications, adverse effects, interaction, routes of administration, dosage schedules and precautions[24].

Family

In our study, findings regarding effects on health literacy by the family were similar to the connection between education and levels of health literacy. There was an adequate level of understanding of some well-known medical terms but no link between parental occupation and knowledge of medical terms was observed.

On the contrary, medical terms that were not adequately known to the majority of respondents show a significant connection to parental occupation. If at least one parent worked in the medical field, the level of understanding of these terms was seen to be significantly higher.

Limits of this survey

There are some limitations of our study. The first is that a standardized test for evaluating the knowledge of medical terms among students was not used. The terms in this survey were chosen at random with the intention of finding the level of understanding of some commonly used and some less commonly used but often encountered medical terms.

The other limit is that the questionnaire was completed during classes and potential uncertainties could only be explained by the teacher or professor present at the time. Although teachers and professors were always well informed about the questionnaire, which also included written instructions, teachers might have provided different explanations for the same procedure.

One of the limitations of this survey is that it was only realized in the Marche region. We can say that the results reflect the cultural background of the central-northern Italian population. Moreover, this study could be limited by the non-equal representation of high school students (66%) and university students (34%).

Conclusion

This study was focused on the knowledge of medical terms among high school students and university students in the region Marche in Central Italy.

It was observed that for some well-known, widely used expressions there is no relation between levels of understanding and age, gender, education or parental occupation.

On the contrary, most terms were not adequately known to the majority of respondents. Higher level of understanding was related to education and to parental occupation. University students had better knowledge of these terms than high school students and comparative school students understood more medical terms than vocational students. Additionally, students with at least one parent working in the medical profession possessed significantly better knowledge of these terms. Otherwise no relation between the knowledge of these terms and age or gender was observed.

Preventive medicine strategies should also be focused on these age groups and cultural backgrounds, as this formative period is appropriate for introducing health care education. Issues related to health literacy should be included in schooling (as study programs in Italy do not include this topic yet).

Abbreviations

HL – health literacy
WHO – World Health Organization
ADR – adverse drug reaction
OTC – Over The Counter drugs

Conflict of interest: none.

References

1. **Altin S. V., Stock S.** The impact of health literacy, patient-centered communication and shared decision-making on patients' satisfaction with care received in German primary care practices. B.M.C. Health Serv. Res. 2016; 30, 450.
2. **Nair S. C., Satish K. P., Sreedharan J., Ibrahim H.** Assessing health literacy in the eastern and middle-eastern cultures. B.M.C. Public Health 2016; 19, 831.
3. **Palumbo R.** Discussing the effects of poor health literacy on patients facing HIV: a narrative literature review. Int. J. Health Policy Manag. 2015; 4, 417–430.
4. **Pharmaceutical Care Network Europe Foundation.** Classification for drug related problems V6.02. 2010. http://www.pcne.org/upload/files/11_PCNE_classification_V6-2.pdf (11. 11. 2014)
5. **World Health Organization.** International Drug Monitoring: The role of national centres. Report of a WHO meeting. Geneva: World Health Organization 1972; 47 p.
6. The Directive 2010/84/EU of the European Parliament and of the Council of 15 December 2010. Strasbourg: Official Journal of the European Union 2010. http://ec.europa.eu/health/files/eudralex/vol-1/dir_2010_84/dir_2010_84_en.pdf (9.12.2014)
7. **Walker R., Whittlesea C.** Clinical pharmacy and therapeutics. 4th ed. Edinburgh: Churchill Livingstone 2007; 900.

8. **World Health Organization.** Health promotion glossary. Division of health promotion, education and communications (HPR) and health education and health promotion unit (HEP). Geneva: World Health Organization 1998; 24 p.

9. **Scudder L.** Words and well-being: how literacy affects patient health. J.N.P. 2006; 2, 28–35.

10. **Chisolm D. J., Buchanan L.** Measuring adolescent functional health literacy: a pilot validation of the test of functional health literacy in adults. J. Adolesc. Health. 2007; 41, 312–314.

11. **Ministero della Salute.** Direzione Generale del sistema informativo e statistico sanitario. http://www.salute.gov.it/portale/documentazione/p6_2_8_1_1.jsp?id=14 (25. 6. 2013).

12. **Davis T. C., Federman A. D., Bass P. F., Jackson R. H., Middlebrooks M., Parker R. M., Wolf M. S.** Improving patient understanding of prescription drug label instruction. J. Gen. Intern. Med. 2008; 24, 57–62.

13. **Gazmararian J. A., Williams M. V., Peel J., Baker D. W.** Health literacy and knowledge of chronic disease. Patient Educ. Couns. 2003; 51, 267–275.

14. **Golbeck A., Paschal A., Jones A., Hsiao T.** Correlation reading comprehension and health numeracy among adults with low literacy. Patient Educ. Couns. 2011; 84, 132–134.

15. **Roter D. L.** Oral literacy demand of health care communication: Challenges and solutions. Nurs. Outlook 2011; 59, 79–84.

16. **Ferguson L. A, Pawlak R.** Health literacy: The road to improved health outcomes. J.N.P. 2011; 7, 123–129.

17. **Davis T. C, Wolf M. S., Bass P. F., Middlebrooks M., Kennen E., Baker D. W., Bennett C. L., Durazo-Arvizu R., Bocchini A., Savory S., Parker R. M.** Low literacy impairs comprehension of prescription drug warning labels. J. Gen. Intern. Med. 2006; 21, 847–851.

18. **Bohlman L. N., Panzer A. M., Kindig D. A.** Health literacy: a prescription to end confusion. Washington, DC: The National Academies Press 2004; b346 p.

19. **Parikh N. S., Parker R. M., Nurss J. R., Baker D. W., Williams M. V.** Shame and health literacy: the unspoken connection. Patient Educ. Couns. 1996; 27, 33–39.

20. **Driessnack M., Chung S., Perkhounkova E., Hein M.** Using the "Newest Vital Sign" to assess health literacy in children. J. Pediatr. Health Care 2014; 28, 165–171.

21. **Connor M., Mantwill S., Schulz P. J.** Functional health literacy in Switzerland – Validation of German, Italian, and French health literacy test. Patient Educ. Couns. 2013; 90, 12–17.

22. **van der Heide I., Rademakers J., Schipper M., Droomers M., SŅrensen K., Uiters E.** Health literacy of Dutch adults: a cross sectional survey. B.M.C. Public Health 2013; 13, 179.

23. **Chan F. W., Wong F. Y., So W., Kung K., Wong C. K.** How much do elders with chronic conditions know about their medication? B.M.C. Geriatr. 2013; 13, 59.

24. **Patel M. J., Khan M. S., Ali F., Kazmi Z., Riaz T., Awan S., Sorathia A. L.** Patients' insight of interpreting prescriptions and drug labels – a cross sectional study. PloS One 2013; 8, e65019.