

## ORIGINAL ARTICLE

# Levels of understanding of the rules of correct medical usage among vietnamese pharmacy students: a cross-sectional study

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## Keywords

Health literacy • Medical terms • Drug usage • Pharmacy students

## Summary

**Background.** Comprehensive misunderstanding about medicine usage is often associated with high treatment risks which have led to unexpected and adverse effects or even death. Many researches assessing health literacy have been undertaken, but only in adults. This study was undertaken to evaluate the level of understanding in students of medical terms and its correlation with gender, grade and parental occupation.

**Methods.** A cross-sectional study was conducted from September to October 2017 with 594 students (28.6% of men and 71.4% of women) of Hanoi University of Pharmacy from freshman to fifth-year students chosen randomly. The knowledge of pharmacy students was assessed by a questionnaire including 25 medical terms. Descriptive statistics and Chi-square test were used with  $p < 0.05$  as level of statistical significance.

**Results.** The level of understanding of students was high with most of medical terms reaching over 70% correct answers. A positive significant association between health literacy and education was found with higher knowledge demonstrated in upper years, while there was no difference among students with and without parents belonging to the medical field. Regarding the relation with gender, there was no significant correlation for most medical terms.

**Conclusions.** Levels of understanding of medical terms in pharmacy students was high, presenting a significant association with education. This study should be extended in order to assess the level of health literacy in various populations, thereby indirect evaluating implementation of medical preventive programs.

## Introduction

Nowadays, along with the continuous economic and social development, people have to face many health and mental problems which increase the demand for drugs. Increased drug use is often associated with high risks of error, abuse or non-compliance in use leading to significant adverse effects or even death [1]. Even if the rules of correct administration of medication are followed, many potential treatment risks still exist and greatly increase if they are not followed. Especially, the fact that people in the developing countries usually select the drug-stores as the first-choice when they have any health problems without the doctor's prescription or follow the social media from pharmaceutical companies which has a great potential for the public to be exposed to misleading or dangerous information about medicine [1-7]. As a result, enhancing the awareness and understanding of people in the rational use of medicines plays a crucial role which helps improve the quality of treatment, reduces costs for patients and society alike and avoids wasting scarce resources and widespread health hazards [8, 9]. One of the first steps to raise people's awareness about proper medicine usage is the better understanding of medical terminology which is commonly used in manuals or instruction sheets. A proper understanding of medical

terminology helps avoid the risk of misunderstanding information on drug use and increases patients' ability to make a personal health-related decision based on available information, as found in the WHO definition about 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" [10-13]. Numerous researches assessing health literacy have been carried out in many countries but exclusively in adults [14-18], and there is still a lack of information about literacy in students and especially students of pharmacy, who will play an important role in health care in the future. As a result, this study was undertaken in order to (a) evaluate the awareness and knowledge of pharmacy students based on their understanding of 25 medical terms, (b) explore possible correlations with gender, education or parental occupation.

## Methods

This is a cross-sectional study assessing levels of understanding of medical terms among university pharmacy students based on the questionnaire distributed to all years from freshman to fifth-year students during 2

months from September to October 2017 when students started the new school year. Participants were students of Hanoi University of Pharmacy (HUP). In HUP, each year was divided into 5 or 6 classes, depending on the number of students in each year. Two or three classes from each year were chosen randomly. After obtaining the permission from the heads of various departments, questionnaires were administered by the research group and collected when the students finished class. The questionnaire was administered only once, all students present on the day of survey were included and absent students were not considered. The completion of questionnaires was absolutely anonymous and voluntary.

The questionnaire was originally created and certified by the University of Camerino, Italy in an Italian and English version and was then translated into Vietnamese by the HUP research group. The questionnaire was divided into 2 parts. The first part concentrated on social and demographic facts and parental occupation, and the second part focused on the knowledge of medical terms which are frequently used in patient information leaflets. The medical terms were obtained from the list of the most used words on 50 OTC package information leaflets in Italy, which was published by the Italian Ministry of Health [19]. From the list, the 24 highest frequency terms were selected corresponding to the Anatomical Therapeutic Chemical Classification System including the following groups: A01, A02, A03, A06, A07, A11, C05, D01, G01, M01, M02, N02, R01, R05. This classification system was also applied in Vietnam. Moreover, the term “teratogenic” was also added to this evaluation in order to consider possible damage from using some medicines during pregnancy. As the result, a total of twenty five terms was used in this part, each term corresponded to 5 definitions including 4 possible answers explaining the term and 1 answer which stated “do not know” in order to add value to the results and avoid blank answers, but there was only one correct answer for each question.

The results were coded and processed using Statistical Package for the Social Sciences (SPSS) software, version 20.0. Descriptive statistics were used to examine the participants’ socio-demographic profile and parental occupation. Chi-square test was used to find the relationship between the level of understanding of medical terms and gender, grade or parental occupation and  $p < 0.05$  was considered as a level of statistical significance.

## Results

Among the 730 questionnaires distributed, 594 students who agreed to participate and complete questionnaires were evaluated (81.4%). The sample included 170 male (28.6%) and 424 female (71.4%) students, with a mean (SD) of age of 20.34 years ( $\pm 1.719$ ). The majority of students were Vietnamese (98%), the other foreign students (1%) came mainly from Cambodia, Laos and Mongolia and 1% did not answer the question on nationality. The percentage of students participating in the survey was not

similar among the grades with most being fourth-year students (160 students, 26.9%). Next were the third-year and first-year students with 125 (21%) and 123 students (20.7%) respectively. The number of second-year and fifth-year students interviewed was much smaller, with 92 (15.5%) and 94 (15.8%) students respectively. The occupations of students’ parents were very different, but agriculture accounted for the highest percentage with over 46% having either father or mother employed in this field and 42.6% having both of them working in this field. The proportion of parents employed in the medical field was very low, at approximately 2.5%.

Results evaluating the knowledge of 25 medical terms were displayed in Table I. Results were organized into the number and percentage of correct answers of each term in all students and the percentage of correct answers of each term in each grade.

According to Table I, the percentage of students choosing correct answers was high with 3/4 of questions getting over 70% correct answers. Around 50-70% students selected the right answers for the terms of “anuria”, “parenteral” and “asthenia”. However, the terms of “erythema”, “exanthema”, “interaction” and “antiaggregant” were not well known with a lower proportion of accurate selections (under 50%), especially “erythema” (14%).

An assessment of associations between levels of understanding of 25 medical terms with gender, grade and parents’ occupation was also carried out with the results shown in Table II.

Table II showed a significant difference ( $p < 0.05$ ) between male and female respondents on the following terms: “parenteral”, “ophthalmic”, “hyperkalemia”, “dyspnea”, “edema”, “dyspepsia”, “antipyretic”, “antalgic”, “analgesic” and “posology” with more correct answers given by female participants than males. The remaining terms showed no significant difference between male and female participants.

In the correlation with grade, there was a significant association ( $p < 0.05$ ) for most terms. Students from upper years had higher rates of correct selections than those of lower years (with the exception of 5<sup>th</sup> year students, who gave a lower percentage of correct answers than 4<sup>th</sup> year students). However, the variable relating to year of study was not significant when associated with the following terms: “erythema”, “parenteral”, “dyspnea”, “antipyretic”, “spasm”, “antalgic” and “posology”.

On the contrary, in relation to parents’ occupation, students whose father or mother were employed in the medical field did not show significant differences in their knowledge of most medical terms compared with the remaining students. However, a correlation was still found for the following terms: “anuria”, “dyspnea”, “asthenia”, “antiaggregant”, “hyperkalemia” and “edema”. The occupation was classified according to 2 categories: (a) occupation in higher education such as doctor, pharmacist, teacher, scientific, business, ... and (b) occupation in lower education such as farmer, unemployed, housewife, general worker. Results from Table II showed that there was a significant difference in health literacy for the following terms: “parenteral”, “ophthal-

Tab. I. Correct answers of students.

Medical terms	Number of correct answers in all students	% of correct answers					
		All students (n = 594)	First-year students (n = 123)	Second-year students (n = 92)	Third-year students (n = 125)	Fourth-year students (n = 160)	Fifth-year students (n = 94)
Erythema	83	14.0	16.3	15.2	8.0	13.1	19.1
Anuria	353	59.4	23.6	37.0	67.2	85.0	74.5
Hematuria	479	80.6	62.6	78.3	81.6	91.3	87.2
Topical	426	71.7	46.3	54.3	72.0	91.3	88.3
Parenteral	346	58.2	50.4	57.6	57.6	66.3	56.4
Ophthalmic	474	79.8	65.0	76.1	80.8	90.0	84.0
Hyperkalemia	481	81.0	67.5	79.3	78.4	91.9	85.1
Anaphylaxis	431	72.6	43.1	57.6	77.6	91.9	86.2
Dyspnea	510	85.9	79.7	83.7	86.4	91.3	86.2
Edema	480	80.8	65.9	70.7	84.0	90.0	90.4
Asthenia	405	68.2	54.5	55.4	70.4	80.6	74.5
Dyspepsia	522	87.9	80.5	85.9	87.2	93.8	90.4
Constipation	502	84.5	76.4	78.3	83.2	91.9	90.4
Antipyretic	526	88.6	84.6	83.7	88.8	93.8	89.4
Exanthema	200	33.7	30.9	42.4	20.0	36.3	42.6
Spasm	417	70.2	66.7	69.6	69.6	75.0	68.1
Antiaggregant	274	46.1	41.5	33.7	42.4	56.9	51.1
Bradycardia	482	81.1	71.5	72.8	80.8	90.6	86.2
Excipient	452	76.1	40.7	71.7	84.0	94.4	85.1
Teratogenic	523	88.0	77.2	89.1	87.2	95.0	90.4
Interaction	221	37.2	21.1	34.8	33.6	47.5	47.9
Antalgic	527	88.7	84.6	85.9	87.2	94.4	89.4
Analgesic	524	88.2	80.5	85.9	87.2	95.6	89.4
Posology	436	73.4	74.8	77.2	76.0	74.4	62.8
Precautions	445	74.9	71.5	63.0	65.6	86.9	83.0

mic”, “dyspnea”, “edema”, “asthenia”, “antipyretic”, “excipient”, “antalgic” and “analgesic”. The remaining terms showed no significant difference between type of occupation and the knowledge of medical terms.

## Discussion

Based on the random sample of 694 students in HUP with 5 years (from first-year to fifth-year students) participating in the questionnaire, levels of health literacy and its association with gender, grade and parents’ occupation were explored. Summing up, students in HUP left less blank questions and had a much higher percentage of correct answers, with most medical terms reaching over 70% correct answers compared with similar results in the Italian survey [20]. The reason for this might be that the respondents in Vietnam were pharmacy students at university level who were mainly educated in

the medical field while Italian respondents were high school students as well as university students of various majors. This result was similar to the research of Montagna in evaluating the knowledge of undergraduate health care students showing a high percentage of correct answers [21].

## GENDER

In this study, we found mixed results regarding the association between level of understanding of medical terms and gender which led to a controversial result about the relation between these 2 variables. The results of our study were similar to many studies which showed no significant correlation for most medical terms [16, 20] and were also similar to other researches which showed a significant difference in health literacy between male and female students, with higher levels of understanding found in women [16, 22-26]. The difference were

Tab. II. p-value between 25 medical terms and relevant variables.

No	Medical terms	p-value				
		Gender	Grade	Father's occupation	Mother's occupation	Occupation's classification
1	Erythema	0.744	0.161	0.456	0.408	0.590
2	Anuria	0.715	0.000	0.043	0.964	0.967
3	Hematuria	0.242	0.000	0.627	0.165	0.187
4	Topical	0.163	0.000	0.239	0.660	0.051
5	Parenteral	0.017	0.112	0.312	0.889	0.007
6	Ophthalmic	0.050	0.000	0.908	0.053	0.009
7	Hyperkalemia	0.014	0.000	0.357	0.006	0.084
8	Anaphylaxis	0.943	0.000	0.264	0.270	0.861
9	Dyspnea	0.009	0.088	0.019	0.159	0.041
10	Edema	0.009	0.000	0.367	0.006	0.008
11	Asthenia	0.178	0.000	0.04	0.018	0.025
12	Dyspepsia	0.020	0.014	0.280	0.080	0.699
13	Constipation	0.054	0.001	0.900	0.625	0.677
14	Antipyretic	0.000	0.078	0.736	0.292	0.050
15	Exanthema	0.415	0.001	0.191	0.599	0.067
16	Spasm	0.642	0.603	0.919	0.382	0.275
17	Antiaggregant	0.421	0.003	0.014	0.106	0.248
18	Bradycardia	0.494	0.000	0.803	0.909	0.075
19	Excipient	0.176	0.000	0.294	0.386	0.019
20	Teratogenic	0.062	0.000	0.785	0.331	0.146
21	Interaction	0.324	0.000	0.118	0.443	0.772
22	Antalgic	0.005	0.080	0.719	0.799	0.022
23	Analgesic	0.032	0.005	0.575	0.867	0.017
24	Posology	0.001	0.150	0.866	0.558	0.551
25	Precautions	0.362	0.000	0.749	0.455	0.221

in the following 10 terms: “parenteral”, “ophthalmic”, “hyperkalemia”, “dyspnea”, “edema”, “dyspepsia”, “antipyretic”, “antalgic”, “analgesic” and “posology”. The reasons for these differences are not clear, women may be more familiar with the terms due to traditional gender roles regarding health and nutrition within the family. Moreover, men tend to have a lower overall awareness of common health conditions [27] and they also tend to seek help only after becoming ill [28]. Future research should consider men and women separately to ensure reliable results.

#### YEAR OF STUDY

In general, the more advanced the students were in study, the higher number of correct choices they made. This finding is consistent with many other studies [15-17, 20, 26, 28] which showed that there was a tight relation between levels of education and better understanding of health literacy. This indicates that education levels played an important role in raising people’s awareness about health literacy which decreased high

risks in incorrect medicine usage due to comprehensive misunderstanding. In our study, it was observed that the 5<sup>th</sup> year students had the lower percentage of right choices than the 4<sup>th</sup> year students which could be explained that the fifth year students began to focus on their majors, paid more attention to their final thesis and rarely applied the knowledge they had learned (except clinical pharmacy students), so they forgot most of their knowledge. This was also a warning that it was essential for students to apply and review their knowledge frequently. For widely used terminologies as “erythema”, “parenteral”, “dyspnea”, “antipyretic”, “spasm”, “antalgic” and “posology”, no significant difference was found.

#### OCCUPATION

In contrast to gender and education, the research showed that students whose parents were employed in the medical field showed no significant difference in levels of health literacy compared with those whose parents were employed in other fields. This could be explained by the fact that the survey candidates were pharmacy

students, so the level of health knowledge was similar among students. However, when carrying out the part of the survey relating to occupation, the type of parental occupation was positively and statistically associated with nearly half the number of medical terms. Students with parents working in higher-level occupations gave higher percentages of correct answers than those with lower-level jobs. This finding was consistent with previous studies [16-18, 25]. Education level and subsequent occupation had a strong correlation, the effect of occupation on health literacy reflected the effect of education on health literacy in a similar way, so individuals with higher levels of family education were more likely to possess higher health literacy.

### STRENGTHS AND LIMITATIONS

A large representative sample of students in medical field with the various years of study is one of the strengths of this study, which provides an overview about the quality of knowledge in pharmacy students who play an important role in the national medical care system. Moreover, this study evaluated the association between many influencing factors and levels of understanding of students, which helps in detection of learning difficulties and set of policies to support and improve curriculum, learning methods or activities. Besides, the questionnaire was designed with the variety and representation of the most common medical terms corresponding to the Anatomical Therapeutic Chemical Classification System, which allows the accurate classification and assessment of health literacy among students.

Our study has some limitations. First, the questionnaire were created by an Italian University and the terms used in this survey were chosen at random from leaflets of the most commonly used OTC drugs in Italy with the intention of finding the level of understanding of some commonly used and some less commonly used but often encountered medical terms – so it was not standardized. As a result, it has not reflected reality in Vietnam. Second, although the initial sample sizes were estimated to be similar among grades, there was still a large disparity due to the absence of students and the difficult access of 2<sup>nd</sup> and 5<sup>th</sup> year students because these students were in the practice stage and rarely in classes. Third, the generalizing our findings to apply to all students was limited to pharmacy students, as it was difficult to obtain permission from the heads of other universities and schools, meaning there was a lack of comparison between universities and schools as well as between age groups.

### Conclusions

This study explored levels of understanding of medical terms in students of Hanoi University of Pharmacy and its association with various variables including gender, grade and parental occupation. The results showed that pharmacy students in Vietnam have higher health literacy compared with multidisciplinary students in Italy. Among the factors, education had a positive effect on the

knowledge and awareness of students. This study should be extended in order to assess the level of health literacy in various populations, thereby indirectly evaluating the implementation of medical preventive programs.

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Student consent and ethics approval: the research was approved by the Council of Hanoi University of Pharmacy. The completion of questionnaires was absolutely anonymous and voluntary. All participants provided written informed consent.

### Conflict of interest statement

None declared.

### Authors' contributions

NTTC conducted the statistical data analyses and wrote the manuscript. SS, NTB contributed to the study design and interpretation of results. PF participated in designing the study protocol and completing the analyses. GI designed the study, built the questionnaire, and made the critical review of the manuscript. All authors gave substantial contribution to manuscript revising and editing.

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