

# A study on Paracetamol consumption by undergraduate students in the Faculty of Allied Health Sciences, University of Peradeniya

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**Abstract-** Self prescribing practices has become a substantial area in health sector due to mal-practices. This study was undertaken to determine the knowledge and perceptions of undergraduate students at University of Peradeniya about the Paracetamol usage by self medication practices. A pre validated questionnaire was administered to 273 randomly selected students in all five courses of Faculty of Allied Health Sciences, University of Peradeniya. Descriptive statistics and multiple logistic regressions were used in data analysis. Associations were evaluated using chi square tests. From all the respondents, 67.4 % were female and 32.6 % were male students. And most of the students were in the age range of 22 – 24years. Most of the respondents were not engaged in exercises or sports. Although self prescription pattern was followed by highest proportion of the study population, the disadvantages of this practice were emphasized by 65 % of students. Main practical reason reported for self prescribing of Paracetamol is having a good knowledge to use it properly and potential source of acquiring Paracetamol was pharmacies and retail shops. “Paracetamol should be taken with a doctor’s prescription” was reported to be the main overall concept of majority of students enrolled in all five courses and majority of students reported that self practicing of Paracetamol was harmful. The study determined that self prescription pattern in the use of Paracetamol is more common than doctor’s prescription practice among Allied Health Sciences students.

**Index Terms-** Paracetamol, Self prescribing, students, socio-demographic characteristics

## I. INTRODUCTION

Paracetamol is one of the most frequently used drugs in self prescribing situations which is a common practice among university students who allured to use a range of medicines from conventional anti-pains to antibiotics without a doctors’ prescription [1]. Self medication is the selection and use of medicines by individuals to treat self recognized illnesses or symptoms [2]. Non-prescription medication taking behavior might lead to problems of misuse [3] and Paracetamol is the commonest agent employed in self poisoning [4]. Illicit use of prescription pain medications may represent a problem among undergraduate students [5]. Because self-medication is one component of self-care, more awareness about the responsible self-medication is needed to foster the level of students’ attitudes towards self-medication practices [6] and it is important to

consider the manners of drug availability and consumption to decrease unnecessary health risks.

Paracetamol as a drug is prescribed for mild to moderate pain and pyrexia. This drug should be used with caution in hepatic impairment, renal impairment and alcohol dependence. It interacts with anticoagulants, cytotoxics, lipid regulating drugs and metoclopramide and side effects are rare but rashes, blood disorders as thrombocytopenia, leucopenia and neutropenia are reported. Over-dosage of Paracetamol causes liver damage and less renal tubular necrosis. Administration of activated charcoal is a useful treatment for Paracetamol poisoning [7]. Poor knowledge regarding side effects, over estimation of the lethal dose and wide availability contributed to increase suicidal incidents [4].

### A. Methodology to Evaluate Drug Use

A previous study performed to assess the effect of the questionnaire structure on recall of drug utilization in a population of university students using two alternative versions of questionnaire; proved that a better concept about prevalence of medicines can be obtained using a questionnaire consisting drug specific questions [8].

There is no published data on usage of Paracetamol by self prescribing practices in the Allied Health Sciences students of University of Peradeniya is not available. The overall objective of this study was to evaluate the Paracetamol usage by self prescription. This is a significant area of the study because the pattern of self prescribing and the knowledge on Paracetamol usage will be measured through this study. Results of the study will be useful to educate the students about the advantages and disadvantages of self prescriptions and doctors’ prescriptions in usage of Paracetamol.

## II. METHODOLOGY

### A. Study Site

A descriptive cross sectional study was conducted in the Faculty of Allied Health Sciences, University of Peradeniya to evaluate Paracetamol usage among allied health sciences students by self prescriptions.

### B. Study Population and sampling

273 students enrolled in the five Allied Health Sciences courses were selected randomly from first year, second year, third year and fourth year students proportionately. Half of the students from each course were selected. The sampling design

was single stage and this method of study which obtained first hand information from the respondents was useful to get better conclusions.

### C. Study Design

The questionnaire was prepared in Sinhala medium and English medium for the purpose of better understanding because of the social ethnicity exist in the university. The pre-validated questionnaires were distributed to randomly selected students to collect data. The process followed standardized protocol including informing the purpose of the study and encryption of respondent's response for confidentiality. The whole questionnaire consisted of open ended and close ended questions. The questions were easily accessed and answered by students. The questionnaire was pretested and the comments were incorporated in the final version. The pretesting method was useful to understand information such as the level of understanding the questions, difficulties in obtaining the information, number of non-responses, order of the questionnaire, missing questions and the space for answering the questions.

### D. Data Collection and Analysis

Data were collected from participants based on three months experiences and analyzed using SPSS statistical package 17.0. The results were presented as absolute figures and percentages to evaluate the Paracetamol usage among Allied Health Sciences students in University of Peradeniya. Both self prescriptions and doctor's prescriptions were considered as sources to evaluate Paracetamol usage. According to the analyzed results, better conclusions were formulated. The results obtained from students enrolled in all courses were compared with variables as age, gender, economical factors, most common reason for self-prescription or doctors' prescription of Paracetamol, most common sources from which the student gain knowledge on Paracetamol and the most common method to obtain Paracetamol without a prescription. This comparison was very useful to get another better conclusion with regard to the knowledge and

practices of the respondents of five courses. A chi-square test was used for categorical variables.  $P < 0.05$  (two-tailed) was considered statistically significant.

Inclusion criteria- Active responses

Exclusion criteria- Non-responses

### E. Ethical Issues

To obtain the consent of the respondents prior to data collection, a detailed explanation on the aim and objectives of the study was given and confidentiality was ensured.

## III. RESULTS

### A. Percentage distribution of the respondents

The data collected from the 273 respondents are presented as percentage distribution according to concerned variables. Percentage distribution of the respondents by courses of Faculty of Allied Health Sciences was 29.7% nursing, 22.0% physiotherapy, 18.3% radiography, 15.8% medical laboratory services (MLS) and 14.3% pharmacy students. Highest proportion of students was enrolled in nursing course while nearly same percentages of others were enrolled in pharmacy, medical laboratory sciences, physiotherapy and radiography. Majority of the respondents were females (67.4%) and nearly one-third were male students (32.6%). 56.8% of students belonged to 22 – 24 years age group. Rest of the students belonging to 20 – 22 years (56.8%) and >24 years (19.8%). When concerning the income level 64.1% of the sample was from families receiving middle monthly income of Rs. 10,000-30,000. Nearly one-fifth of students were from families receiving lower income. 6.6% of students were from families receiving income higher than Rs. 50,000. Health status of the respondents was evaluated by concerning criteria as involvement of sports and frequent exercise. Only 13.6% and 22.3% of students allured to involve in exercises and sports respectively. Majority of respondents had not participated in sports or involve in frequent exercise.

### B. Usage of Paracetamol by self prescribing

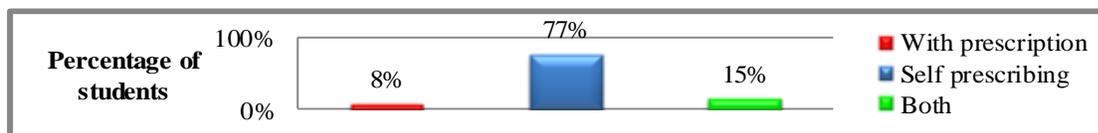
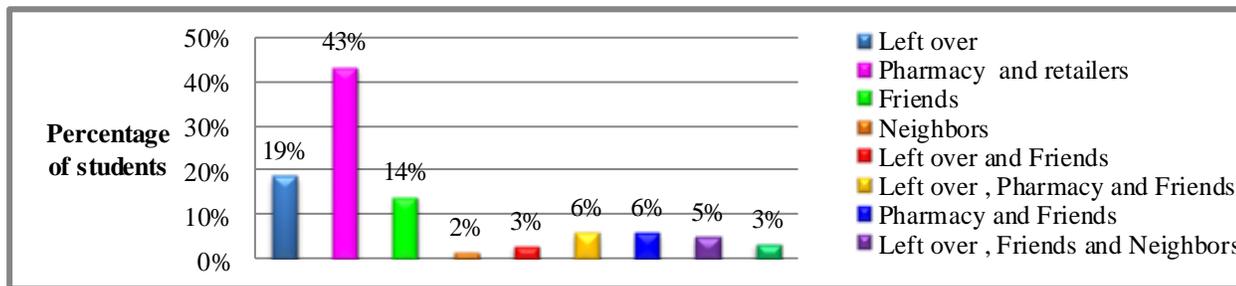


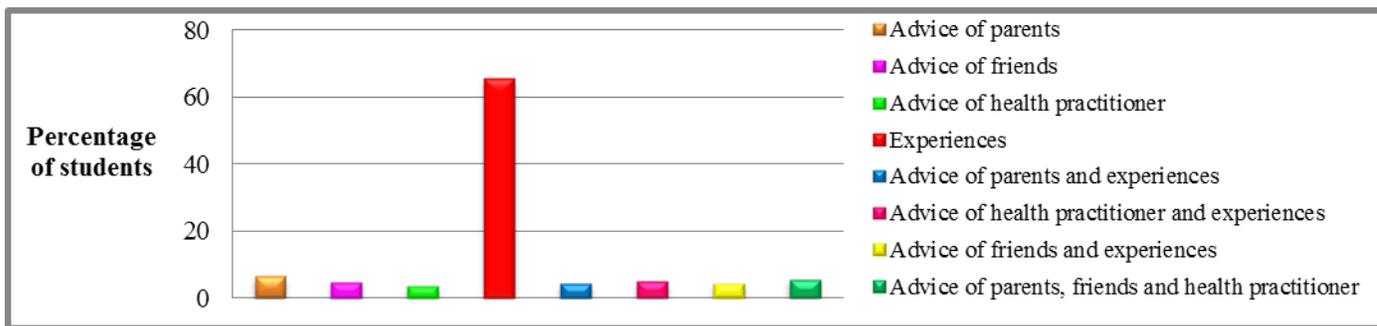
Figure 1: Patterns of taking Paracetamol

According to figure 1, more than three-fourth of the students had taken Paracetamol without a doctor's prescription. Only few students had taken Paracetamol with a doctor's prescription.



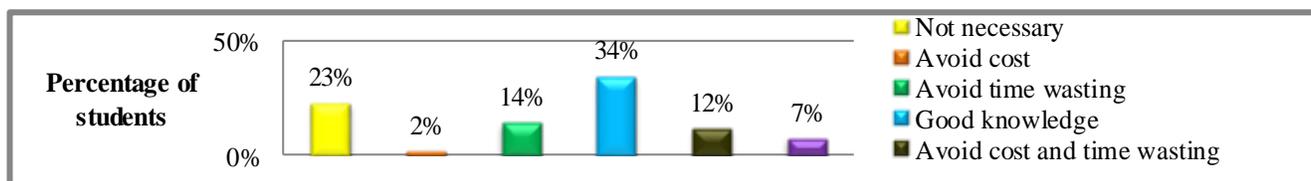
**Figure 2: Method of obtaining Paracetamol**

The reported main potential source of acquiring Paracetamol was pharmacies and retail shops. Significant number of students had obtained Paracetamol from friends and had used left over tablets. An insignificant percentage of students had obtained Paracetamol from neighbors according to figure 2.



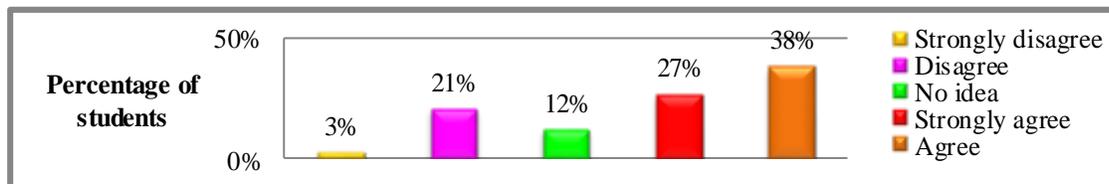
**Figure 3: Criteria for self practicing Paracetamol**

Majority of respondents (66%) had taken Paracetamol without a doctor's prescription based on their previous experiences on Paracetamol usage. The other respondents had got advices from parents, friends and health practitioners in addition to their experiences as shown in figure 3.



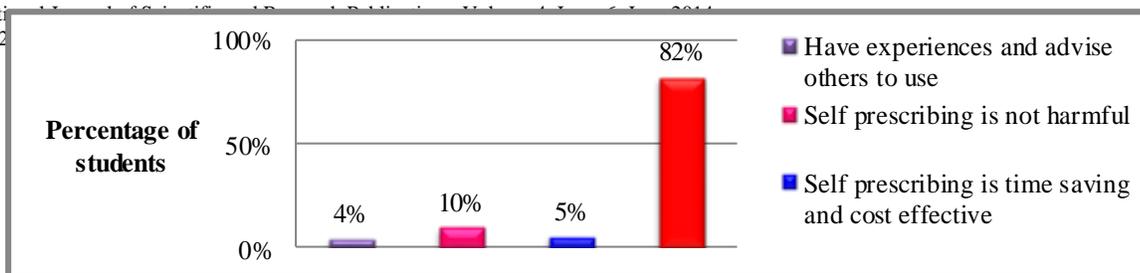
**Figure 4: Practical reason to take Paracetamol without a medical prescription**

Figure 4 shows that the main practical reason reported for self prescribing Paracetamol is having a good knowledge to use it properly. One-fourth of students revealed the reason for self practicing is as it was not necessary to meet a doctor prior to taking Paracetamol. Other reported practical reasons in minor percentages were to avoid cost and to avoid wasting time.



**Figure 5: Self practicing of Paracetamol is harmful**

According to figure 5 majority of students reported that self practicing of Paracetamol was harmful. A significant percentage of students reported it as not harmful. However about one-fifth of students had not taken any judgment.



**Figure 6: Overall concept of using Paracetamol**

When concerning figure 6, although most of the respondents practiced self medication with Paracetamol, they asserted their overall concept on Paracetamol usage as Paracetamol should be taken with a doctors' prescription. About one-tenth of students expressed their overall concept as self prescription with Paracetamol as not harmful. Rest of the students reported self prescription practice is time saving and cost effective.

#### IV. DISCUSSION

Paracetamol is an over the counter (OTC) drug which is recommended for indications such as mild to moderate pain and pyrexia according to the British National Formulary [7]. In this descriptive study we have analyzed the impact of several variables on usage of Paracetamol by self prescribing among Allied Health Sciences students. Homogenous nature of the study center and prospectively defined criteria of Paracetamol usage were included as the strength of the study. Randomly selected sample of subjects is representative of all Allied Health Sciences courses; pharmacy, physiotherapy, MLS, radiography and nursing. Multicultural students were included in the study as they have different beliefs and personal views on health and medicines using patterns.

Previous studies revealed that about 83.1% of university students used non-prescription drugs [3] and self medication is the most prevailed pattern in using medications among the subjects [3,9]. According to the outcomes of many researches Paracetamol and non steroidal anti inflammatory agents (NSAIDs) were the most frequently consumed medicines [1, 2, 4, 6] and analgesic usage was very common among university students, which was 98% [2]. The most famous drugs in general practitioners' drug prescribing practices were Phenoxymethylpenicillin, Paracetamol and Diazepam for males and Diazepam, Codeine and Triazolam for females [10].

The overall results of the study which aimed at assessing the usage of Paracetamol by self prescriptions as well as by doctors' prescription could not be compared with the previously conducted studies because they have mainly focused on self prescription patterns instead of considering both self prescription and doctors' prescription patterns. The main reported indications for self prescribing of Paracetamol were headache, common cold and fever [11].

According to a previous study only 38.5% students practiced self medication [1] in contrast to current study which revealed more than 77% students practiced self medication with Paracetamol. Only 8% students of total obtained a doctor's prescription prior to using Paracetamol while 15% students practiced both (figure 1). A previous study determined that there was a significant difference in drug usage between the different courses [12]. When considering patterns of the Paracetamol

usage of five courses separately, 79% students in pharmacy and nursing practiced self-medication with Paracetamol; 76% of medical laboratory sciences and physiotherapy students used Paracetamol without a prescription which was practiced by 73% of radiography students. Nearly one tenth of students enrolled in pharmacy, medical laboratory sciences and radiography reported prescription pattern with Paracetamol. Only 4% of nursing students and 6% of physiotherapy students practiced doctor's prescription method when using Paracetamol. The student population who obtained doctor's prescription prior to taking Paracetamol is relatively low in physiotherapy and nursing when compared with other three courses. There were no statistically significant association between the following courses and the patterns of Paracetamol usage.

A study conducted in Brazil has concluded that the medication knowledge might contribute to increase self-medication [9, 13]. Similarly significant associations between the Paracetamol usage and Allied Health Sciences courses were observed from the outcomes of current study as prevalence of self prescription practice is higher among them (figure 1). Accordingly higher educated people seem to be more animated in self medication. But another research found that there were no significant differences between medical and non-medical students regarding self-medication practices [14].

In current study, figure 4 shows that the highest number of respondents had reported that they used Paracetamol without a prescription because of having a good knowledge about Paracetamol usage while a minimum percentage of respondents reported it was to avoid cost of doctor visit, without a course variance. This attribute was highly characterized by pharmacy students who had not thought that it is not necessary to see a doctor before taking Paracetamol, when compared to other courses. It might be due to their medical knowledge regarding pharmacokinetics, pharmacodynamics and pharmacology related to the drugs. So they might know the risk of not seeing a doctor before taking a drug more than other students. According to literature prior experiences and mildness of the disease were the two main reasons for self medication [1, 6].

This study determined the potential source of acquiring Paracetamol as pharmacies and retail shops which dispense the drugs as Paracetamol without a prescription (figure 2). The highest percentages of the students enrolled in all five courses had obtained Paracetamol from the pharmacies. It is a major issue that the most of the pharmacies do not offer any counseling on the proper use of Paracetamol and supply the drugs such as Paracetamol without prescription only considering on their profit maximization. It is a big responsibility of the pharmacists to reduce the self prescription practice with Paracetamol. A significant percentage of the students had used left over Paracetamol. It is pharmacists' and regulatory authority's duty to

enforce the people to use doctors' prescription with Paracetamol usage to reduce misuses and readmissions. A past study reported that large storages of home medicine cabinets as the potential source of both prescription and OTC drugs for the students attending a private university in Bangladesh [15] and another study revealed that the main source of acquiring drugs is drug retail outlets [6].

Majority of the respondents had used Paracetamol with and without a doctor's prescription on their previous experiences (figure 3). A piece of half students had practiced doctor's prescription pattern and self prescription pattern with Paracetamol on the advice of a health practitioner. Only one student had used Paracetamol with a doctor's prescription on the advice of the parents. Only one student had got advices from the friends to use Paracetamol with a prescription. According to literature the reported uppermost information sources were self decisions followed by family and friends [6] or peers followed by family members [5]

Socio-economic characteristics cause wide range of variations of self prescribing practices [13]. Statistical outcomes of the study revealed that there was a significant association between the gender and the reasons for self prescribing Paracetamol. Female students used Paracetamol more frequently by self prescribing than males. This fact was proved in a study designed to assess the impact of sex on self-medication patterns and showed that females acquired drugs for self-medication more than male students [16]. This can be justified concerning fact that females used analgesics and antihistamines significantly more frequently [12] and according to a study, 70% of the students with menstrual discomfort used OTC medication for manage discomfort [17]. The highest percentage of both genders had taken Paracetamol without a doctor's prescription because of having a good knowledge (figure 4). Nearly one-fourth of total males and total females had mentioned that it is not necessary to see a doctor before taking Paracetamol. Minimum percentage of female students had used Paracetamol without a prescription to avoid cost. But none of male students had mentioned that cause as a reason for Paracetamol self prescription. According to these results the education and the knowledge was the dominated factor for increase self prescription practice among the students. The sex difference had not significantly impacted on the overall concept of Paracetamol usage (Figure 6). Majority of them had reported that Paracetamol should be taken with a doctor's prescription. But the problem is the motivation of them for self prescribing Paracetamol, knowingly the disadvantages of that.

There was a statistically significant association between the age groups and the method of Paracetamol usage. More than half students with the use of Paracetamol without a prescription were in 22-24 years age group which was females with 15 – 24 years age group in a previous study. Nearly half respondents practiced doctors' prescription method with Paracetamol was also in 22-24 years age group. The lowest percentages of the respondents used Paracetamol with a prescription and without a prescription were in 20-22 and >24 years age groups respectively. In accordance with these results, the self prescription practice was more common among the students in 20-22 years age group. A significant percentage of the students had used both patterns in 22-24 and >24 years age groups.

The statistics of the study showed that there was no significant association between the age groups and the reasons to take Paracetamol without a prescription. The highest percentage of the students had reported that they practiced self prescription with Paracetamol due to having a good knowledge, without an age variance (figure 4). The lowest percentage of the respondents in all age groups had mentioned that they used Paracetamol without a prescription, to avoid cost. So, the age has less effect on the reason of Paracetamol self prescription.

Most of the respondents in all age ranges had mentioned that Paracetamol should be taken with a doctor's prescription (figure 1). Rest of the students in 20-22 years age group had reported that the self prescription with Paracetamol is not harmful (figure 5). None of them had advised to others to take Paracetamol without a prescription, on the previous experiences and had mentioned that the practice of self prescription with Paracetamol saves time and money. A minimum percentage of the students in 22-24 years age group had revealed that they advice others to take Paracetamol without a prescription. The lowest percentage of the students in >24 years age group had reported that the self prescription of Paracetamol is not a harmful practice and it saves the time and money. The results show that the students in all age groups have enough knowledge to understand the importance of a prescription. But the problem is that they feel self prescription as not harmful (figure 5) on their previous experiences.

Majority of the students had taken Paracetamol without a prescription, without an income variance. Only one student with a 30000-50000 rupees income had taken Paracetamol with a prescription; in which the result was similar to >50000 rupees income level. Majority of the students used Paracetamol without a doctors' prescription were in 10000-30000 rupees income level. According to the results of a previous study, self-medication tended to be higher in people with intermediate incomes [13]. But, there were no significant association between the income levels and the reasons to take Paracetamol without a prescription. The highest proportion of the students getting <10000, 10000-30000 and >50000 rupees incomes had used self prescription pattern as they having a good knowledge to use Paracetamol properly. The highest percentage of the students getting 30000-50000 rupees income had reported that it is not necessary to see a doctor before taking Paracetamol. None of the students having 30000-50000 and >50000 rupees income had reported that they used self prescription with Paracetamol to avoid the cost. This result might be obtained because the cost of doctor visit is not such unbearable expenditure for the students having higher income levels. But, with the students having other income levels, the lowest percentage had taken Paracetamol without a prescription to avoid cost.

Most of the respondents who used Paracetamol with or without a prescription had not participated in the sport events; 13 % from the respondents who participated in the sport events had taken Paracetamol with a doctor's prescription while 22% had taken without a doctor's prescription. So participation in the sport events could be explained as a diminutive predictor to Paracetamol using patterns. In accordance with the outcomes of the study, involvement in frequent exercises also could be recognized as a diminutive factor which was insignificantly affected the method of Paracetamol usage.

Previous studies showed that more than half of the students disagreed with the practice of self medication [6] and 90% of all students mentioned that Paracetamol could cause death; while majority of them overestimated the lethal dose [4]. The investigations of current study showed that there was no statistically significant association between the following Allied Health Sciences courses and the overall concept (Figure 6). Although the majority of students in all five courses had practiced self-medication with Paracetamol, their overall concept was "Paracetamol should be taken with a doctors' prescription". Generally a minimum percentage of students except MLS students had reported that they advice others to take Paracetamol without a prescription on their previous experiences. It seems nevertheless majority of students have a good knowledge about the pros and cons of self-medication practices with Paracetamol, they have used to self medication practices due to the traditional acceptance and experiences. Self-medication might be used as a way to cope with the obstacles to medical care.

Finally the results of this study suggest that the self medication practice with the drugs as Paracetamol is more common among the Allied Health Sciences students in University of Peradeniya than the prescription medication pattern. Impact of several factors such as the course and physical activities on the Paracetamol using pattern was insignificant.

## V. CONCLUSION

In accordance with the results of this study self prescription pattern was more common than doctor's prescription pattern among Allied Health Sciences students in University of Peradeniya. These practices of students were not significantly influenced by the socio-demographic factors such as physical habitats, following Allied Health Sciences course. Pharmacies and retail shops are easy accessible sources of drugs such as Paracetamol due to various economic aspects. Not only university students but also general public should be mind imprinted that self medication of drugs such as Paracetamol is not always appropriate to be used to overcome health problems.

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