

The knowledge and awareness among Hashemite University students about over-the-counter analgesics use and side effects and the impact of stress level on their abuse

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Abstract

Over the counter (OTC) analgesics are widely used by people in our society. A questionnaire survey including 357 students at Hashemite University completed the survey. We aimed to evaluate the awareness of university students about OTC analgesics and the relationship between their use and stress parameters.

Keywords: NSAID's, Stress, University students, Coffee drinking.

INTRODUCTION

Over the counter (OTC) analgesics being easily sold from community pharmacies nowadays. These drugs are used by most people of all ages without any awareness's of the potential for their adverse effects¹. The widely used agents from OTC analgesics are paracetamol (Panadol®), Ibuprofen (Profen®) and Diclofenac Sodium (Voltaren®).

Although Paracetamol is considered safe when administered at therapeutic doses ², there is a potential risk for drug-induced liver injury and acute liver failure when taken in large doses and/or by frequencies that considered wrong in routine practices^{3,5}. Ibuprofen and Diclofenac Sodium are non-steroidal anti-inflammatory drugs (NSAID's) that are associated with gastropathy when used frequently specially on an empty stomach⁴. Many patients take these drugs for different levels of pain and without even reading the included leaflet ⁵.

In Jordan, a master student at Jordan University (JU) studied the factors that may affect knowledge, attitude and practice of JU participants regarding the appropriate use and

misuse of paracetamol and they came out with conclusion of poor knowledge (<50%) in both participants from health science and non-health science faculties⁶.

Stress can be a result of physical or emotional distresses in individuals. It may be transient but uncontrollable stress may deteriorate the behavior of person ⁷. Many disease states have been associated with stress. For example, musculoskeletal problems were found to be associated with stress⁷.

Many adolescents might have low self-awareness of physiological and emotional changes during their lives ⁸ and may describe these changes as part of pain illnesses.

MATERIALS AND METHODS

This cross-sectional study was conducted at the Hashemite University (HU), the fifth public university in the Hashemite Kingdom of Jordan. It is located in the vicinity of Zarqa on a strategic site parallel to the international highway that links Amman with Mafraq, at the

crossroad that connects Saudi Arabia, Syria, and Iraq.

A total of 357 participants were asked to participate in this study. Inclusion criterion was: being student in HU.

All participants were told that any data they provided would be kept confidential and that they would receive no financial compensate for their participation. Participants were interviewed on HU campus, and they were asked to fill-in five parts questionnaire that contain thirty nine questions.

In the first part of the questionnaire, sociodemographic factors such as age, gender, and education level were covered. In the second part, participants' daily habits were collected. General knowledge about OTC analgesics in the third part. Stress scale also included in the fourth part of the questionnaire. Individual use of these analgesics was assessed using the questions of part five.

STATISTICAL ANALYSIS

Data were analyzed using SPSS statistical software (SPSS 12.0). Descriptive statistics were made for each variable. Chi-square test was used to examine the significant differences between variables and significance was established as $p < 0.05$. Missing data were not used in analysis and the valid percentages were used for each question.

Table 1: *Percentage of Coffee intake and Nescafe intake among participant classified by their gender*

	Gender	Male	Female	Chi-square
Daily coffee intake	I don't drink	54.1%	65.3%	0.014
	1-2 Cups	37.6%	31.7%	
	3-4 Cups	8.2%	1.9%	
	More than 4 Cups	0.0%	1.1%	
Daily Nescafe intake	I don't drink	60.0%	33.8%	0.000
	1-2 Cups	40.0%	61.7%	
	3-4 Cups	0.0%	2.0%	
	More than 4 Cups	0.0%	1.4%	

RESULTS

Data pertaining to 357 participants were analyzed. Average patient age was 25.4 year-old, consisting of 24.2% male and 75.8% female. In terms of academic level, 31.7% were in first year and second year, 38.9% were in third year and 29.5% were graduate participants. Of our participants, 45.2% were from scientific specialization, 48.4% were from literary and humanitarian disciplines and 6.2% participants were studying engineering. With regard to the residency, 39.8% participants live in Amman, 43.5% in Zarqa and 16.2% live in north and south Jordan. Of the 357 participants, 48.35% had ideal weight, 16.9% were skinny, 32.3% were overweight and 2.5% were obese. Regarding family monthly income, 28.5% received less than 500 JD, 44.9% had income ranged between 501-1000 JD, and 26.5% had income more than 1000 JD. The presence of relatives who work as a doctor, a pharmacist or a nurse were also analyzed in our questionnaire, 48.3% answered yes and 51.7% answered no.

There were significant differences between genders regarding coffee & Nescafe intake as shown in Table 1. Females had lower coffee intake and higher Nescafe intake percent compared to that in males.

Of our results shown in Tables 2, Females were significantly ($p < 0.05$) more aware of the stomach ulcer induced by ibuprofen when

taken on an empty stomach. In addition, they were more aware about the correct use of Ibuprofen regarding meals.

Table 2: Knowledge of students about the side effects of paracetamol, Ibuprofen, timing of Ibuprofen administration classified by gender

	Gender	Male	Female	Chi-square
Incorrect use of Paracetamol (such as Panadol) may cause stomach ulcer				
	Agree	36.5%	52.5%	0.006
	Neutral	48.2%	29.4%	
	Disagree	15.3%	18.1%	
Incorrect use of Ibuprofen (such as Brofen) may cause stomach ulcer				
	Agree	58.8%	74.3%	0.024
	Neutral	32.9%	20.1%	
	Disagree	8.2%	5.6%	
You can take Ibuprofen (such as Profen®) on an empty stomach				
	Agree	2.4%	3.4%	0.002
	Neutral	26.5%	10.9%	
	Disagree	71.1%	85.7%	

In addition, females were more conservative about the use of both drugs during pregnancy as 61.3% and 71.2% of females disagree about the use of paracetamol and ibuprofen,

respectively. On the contrary, 41.2% and 49.4% of males respectively, disagree (this is shown in Tables 3).

Table 3: Knowledge of students about the use of Paracetamol and Ibuprofen during pregnancy classified by their gender

Question	Answer	Male	Female	Chi-square
Women can take paracetamol (such as Panadol) during pregnancy	Agree	20.0%	19.5%	0.001
	Neutral	38.8%	19.2%	
	Disagree	41.2%	61.3%	
Women can take Ibuprofen (such as Brofen) during pregnancy	Agree	5.9%	3.4%	0.001
	Neutral	44.7%	25.5%	
	Disagree	49.4%	71.2%	

Table 4 shows the relationship between weekly sport rates and the collage in which our participants are enrolled. There was a huge variation on the rate of exercising among students from different faculties. Students in

the faculty of sport had the highest rate of exercising during the week (2-3 times/week) and more than 50% of students of Faculty of Sciences do not perform any exercises.

Table 4: *Weekly sports rate of participants classified by their College*

Weekly sport Collage	None	Daily	Once weekly	2-3 times weekly	Chi-square
Pharmacy	30.2%	20.8%	37.7%	11.3%	
Nursing	21.6%	32.4%	27.0%	18.9%	
Tourism	44.8%	6.9%	27.6%	20.7%	
Educational Sciences	0.0%	0.0%	100%	0.0%	
Queen Rania for Childhood	50.8%	16.4%	26.2%	6.6%	
Allied Health Sciences	37.5%	0.0%	50.0%	12.5%	
Sport	8.3%	29.2%	20.8%	41.7%	0.004
Sciences	66.7%	0.0%	33.3%	0.0%	
Economic	40.0%	12.7%	30.9%	16.4%	
Natural Resource and Environment	33.3%	0.0%	66.7%	0.0%	
Engineering	50.0%	0.0%	36.4%	13.6%	
Medicine	46.7%	8.3%	25.0%	20.0%	

The awareness of participant regarding the side effects of OTC analgesics was in direct relationship with their academic level. As the academic level of the participant increased, the awareness regarding the analgesic side effects increased as shown in Table 5.

None of the Participants in the Fifth year level agree that OTC analgesics do not cause side effect.

Table 5: *Knowledge of participants about safety of analgesics classified by their academic level*

OTC analgesics do not cause Side effect	Agree	Neutral	Disagree	Chi-square
Academic level				
First year	20.0%	26.7%	53.3%	
Second year	29.6%	15.3%	55.1%	
Third year	28.8%	30.9%	40.3%	0.036
Fourth year	34.0%	15.5%	50.5%	
Fifth year	0.0%	42.9%	57.1%	

The results of the questionnaire that described the stress scale in relation to gender are shown

in Table 6. There was no significant difference in stress levels between males and females.

Table 6: *Stress level among participants classified by their gender*

Stress scale in last month Gender	0-13 normal	14-19 low stress	≥ 20 High stress	Chi-square
Male	15.3%	35.3%	49.4%	0.350
Female	12.1%	29.5%	58.3%	

The results of the questionnaire that described the stress scale in relation to collage is shown in table 7. There was no significant difference in stress levels among students from different colleges.

Table 7: *stress levels of participants classified by their college*

Stress scale in Last month Collage	0-13 normal	14-19 low stress	≥ 20 High stress	Chi-square
Pharmacy	21.7%	9.3%	16.8%	0.418
Nursing	13.0%	13.1%	8.7%	
Tourism	6.5%	8.4%	7.7%	
Educational Sciences	0.0%	0.0%	0.5%	
Queen Rania for Childhood	15.2%	17.8%	17.9%	
Applied Health Sciences	0.0%	3.7%	2.0%	
Sport	6.5%	8.4%	5.6%	
Sciences	0.0%	0.9%	1.0%	
Economic	4.3%	12.1%	19.4%	
Natural Resource and Environment	0.0%	1.9%	0.5%	
Engineering	6.5%	5.6%	6.6%	
Medicine	26.1%	18.7%	13.3%	

The results of stress scale in relation to academic year are shown in Table 8. Most of the students were in the high stress group (stress scale ≥ 20) and there was no significant difference among students in different academic levels.

Table 8: *Stress level of participants classified by their academic level*

Stress scale in Last month Academic level	0-13 normal	14-19 low stress	≥ 20 High stress	Chi-square
First year	30.8	7.7	61.5	0.216
Second year	11.6	32.6	55.8	
Third year	12.9	36.7	50.4	
Fourth year	12.5	25.0	62.5	
Fifth year	14.3	14.3	71.4	

In Table 9, the monthly income for participants significantly ($p < 0.05$) affect the stress scale. High stress scale were found in only 7.7% of participants' whose monthly income exceeded

1500 JD. On the Contrary, 45.4 & 32.1% of the participants who have monthly income of 501-1000 and less than 500 have high stress scores, respectively.

Table 9: *Stress scale among participants classified by their monthly income*

Stress scale in	0-13	14-19	≥ 20	Chi-square
Last month	normal	low stress	High stress	
Monthly income				
Less than 500	10.9%	31.1%	32.1%	
501-1000	32.6%	47.2%	45.4%	
1001-1500	39.1%	17.0%	14.8%	0.000
More than 1500	17.4%	4.7%	7.7%	

There was no significant difference in stress scale among participants with different weight as shown in Table 10.

Table 10: *Stress scale among participants classified by their body weight*

Stress scale in	0-13	14-19	≥ 20	Chi-square
Last month	normal	low stress	High stress	
Weight				
Ideal	16.7%	33.9%	49.4%	
Skinny	8.5%	30.5%	61.0%	
Overweight	10.5%	26.3%	63.2%	0.312
Obese	11.1%	33.3%	55.6%	

Results in Table 11 describe the effect of daily habit on stress scale in our participants. There was no significant differences in stress scales among different daily coffee or Nescafe intake. Interestingly, the high percentage in each stress

scale is for either “do not drink” or just have “1-2 cups” of coffee or Nescafe per day as compared to participants who either drink 3-4 cups or more than four cups per day.

Table 11: *Stress scale among participants in relation to daily coffee and Nescafe intake*

Stress scale in last month		0-13	14-19	≥ 20	Chi-square
		normal	low stress	High stress	
Daily coffee intake	I don't drink	67.4%	63.9%	60.6%	0.790
	1-2 cups	30.4%	32.4%	34.2%	
	3-4 cups	2.2%	3.7%	3.6%	
	More than four cups	0.0%	0.0%	1.6%	
Daily Nescafe intake	I don't drink	47.8%	38.3%	39.5%	0.520
	1-2 cups	52.2%	59.8%	55.4%	
	3-4 cups	0.0%	0.9%	3.1%	
	More than four cups	0.0%	0.9%	2.1%	

Table 12 shows the effect of monthly income on participant's daily habits. There was no significant differences between monthly income and each of the following: daily intake

of coffee & Nescafe, weekly smoking rate, weekly sport rate, hours of daily sleep, and hours to get to university.

Table 12: *Daily habits vs. monthly income of participants*

Habit	Monthly income	Less than 500	501-1000	1001-1500	More than 1500	Chi-square
Daily coffee intake	I don't drink	59.6%	64.6%	62.1%	57.1%	0.562
	1-2 Cups	35.4%	32.3%	34.8%	32.1%	
	3-4 Cups	5.1%	1.9%	3.0%	7.1%	
	More than 4 Cups	0.0%	1.3%	0.0%	3.6%	
Daily Nescafe intake	I don't drink	42.6%	34.4%	53.0%	32.1%	0.134
	1-2 Cups	56.4%	61.1%	42.4%	64.3%	
	3-4 Cups	1.0%	3.2%	1.5%	0.0%	
	More than 4 Cups	0.0%	1.3%	3.0%	3.6%	
Daily smoking rate	I don't smoke	94.1%	93.7%	95.5%	92.9%	0.296
	Less than 10 cigarettes	0.0%	1.3%	1.5%	3.6%	
	10-20 cigarettes	2.0%	4.4%	3.0%	0.0%	
	More than 20 cigarettes	4.0%	0.6%	0.0%	3.6%	
Weekly	None	35.6%	38.4%	43.9%	35.7%	0.540
Sport rate	Daily	16.8%	15.7%	10.6%	17.9%	
	Once weekly	32.7%	32.1%	22.7%	21.4%	
Ave. hrs. Of sleep at night	2-3 times weekly	14.9%	13.8%	22.7%	25.0%	0.481
	Less than 5	10.9%	10.1%	13.6%	10.7%	
Hrs. to get to University	5-6	50.5%	51.9%	62.1%	39.3%	
	7-8	29.7%	32.3%	21.2%	42.9%	
Hrs. to get to University	More than 8	8.9%	5.7%	3.0%	7.1%	0.069
	Less than 1 hour	38.6%	57.9%	53.0%	57.1%	
Hrs. to get to University	1.5-2 hours	50.5%	37.1%	42.4%	39.3%	
	More than 2 hours	10.9%	5.0%	4.5%	3.6%	

The results of the questionnaire that described the frequency of OTC analgesics use in relation to stress scale are shown in Table 13. There was a significant direct relationship between

the amount of analgesic intake and the stress scale. 85.7% of participants who scored more than 20 for stress take analgesics more than 4 days of week.

Table 13: Frequency of analgesics use vs. Stress level of participants

I use OTC Analgesics Stress scale In last month	I use OTC analgesics					Chi-square
	One day per week	2-3 days per week	4-7 days per week	Two days or less monthly	I don't use it	
0-13 normal	9.1%	9.1%	4.8%	19.6%	14.4%	0.000
14-19 low stress	40.3%	12.7%	9.5%	37.1%	30.9%	
≥ 20 high stress	50.6%	78.2%	85.7%	43.3%	54.6%	

The results of the questionnaire that described the frequency of OTC analgesics use in relation to gender are shown in Table 14. Interestingly, females take

(0.35) among male and females in regards to their stress levels as shown in table 15, but 58.3% of females had high stress compared to 49.4 % of males.

analgesics significantly higher than males. Although there were no significant differences

Table 14: Frequency of Analgesics use among participants classified by gender

I use OTC Analgesics Gender	I use OTC analgesics					Chi-square
	One day per week	2-3 days per week	4-7 days per week	Two days or less monthly	I don't use it	
Male	22.8%	16.4%	18.2%	10.3%	45.8%	0.000
Female	77.2%	83.6%	81.8%	89.7%	54.2%	

Table 15: Daily Nescafe intake of participants vs. stress level classified by their gender

Stress scale in Last month	0-13 normal	14-19 low stress	≥ 20 High stress	Chi-square
Daily Nescafe intake				
Male	15.3%	35.3%	49.4%	0.35
Female	12.1%	29.5%	58.3%	

Table 16 describes the frequency of OTC analgesics use in participants from different collages. There was significant difference (0.033) among OTC analgesics use & colleges. For example, 22.7% from pharmacy

participants take these medications more than 4 days per week. On the other hand, participants from natural resource and environment collage do not take OTC analgesics.

Table 16: *Frequency of analgesics use among participants classified by their college*

I use OTC Analgesics Collage	I use OTC analgesics					Chi-square
	One day per week	2-3 days per week	4-7 days per week	Two days or less monthly	I don't use it	
Pharmacy	13.9%	14.5%	22.7%	16.7%	13.4%	0.033
Nursing	5.1%	12.7%	4.5%	8.3%	16.5%	
Tourism	8.9%	5.5%	4.5%	10.4%	7.2%	
Educational Sciences	1.3%	0.0%	0.0%	0.0%	0.0%	
Queen Rania for Childhood	24.1%	14.5%	27.3%	11.5%	16.5%	
Applied Health Sciences	0.0%	1.8%	0.0%	6.2%	1.0%	
Sport	11.4%	3.6%	9.1%	3.1%	7.2%	
Sciences	0.0%	3.6%	0.0%	1.0%	0.0%	
Economic	19.0%	14.5%	27.3%	14.6%	10.3%	
Natural Resource and Environment	0.0%	0.0%	0.0%	0.0%	3.1%	
Engineering	3.8%	10.9%	4.5%	5.2%	7.2%	
Medicine	12.7%	18.2%	0.0%	22.9%	17.5%	

The results of the questionnaire that described the effect of daily habits on OTC analgesics use are shown in Table 17. There was a significant

difference ($p < 0.05$) between coffee intake and analgesic use. Participants who do not drink coffee uses analgesics more frequently.

Table 17: Frequency of analgesics use among participants vs. their daily coffee and Nescafe intake

		I use OTC analgesics					Chi-square
		One day per week	2-3 days per week	4-7 days per week	Two days or less monthly	I don't use it	
Daily coffee Intake	I don't drink	65.4%	58.5%	36.4%	68.0%	63.9%	0.005
	1-2 cups	33.3%	35.8%	45.5%	27.8%	33.0%	
	3-4 cups	1.3%	3.8%	9.1%	4.1%	3.1%	
	More than 4 cups	0.0%	1.9%	9.1%	0.0%	0.0%	
Daily Nescafe intake	I don't drink	33.3%	37.0%	22.7%	35.1%	55.7%	0.003
	1-2 cups	66.7%	55.6%	72.7%	60.8%	42.3%	
	3-4 cups	0.0%	7.4%	0.0%	2.1%	1.0%	
	More than 4 cups	0.0%	0.0%	4.5%	2.1%	1.0%	

As shown in Table 18 there was a significant ($p < 0.05$) effect of how much participant sleep per night on how much he/she used analgesics during the same month. 60.0% of participants who take OTC analgesics three times weekly sleep 5 to 6 hours per day compared to 5.5% of participants who sleeps more than 8 hours uses

analgesics 2-3 days per week. It was also noticed that there is a direct significant ($p < 0.05$) relationship between pain degree and how much analgesics being used. As the degree of pain increases, the amount of analgesic intake increases too.

Table 18: Frequency of analgesics use among participants vs. their average hours of sleep at night and the degree of pain

Frequency		Use OTC analgesics					Chi-square
		One day per week	2-3 days per week	4-7 days per week	Two days or less monthly	I don't use it	
Ave. hrs. of Sleep at night	5-6	59.5%	60.0%	54.5%	49.0%	46.4%	0.013
	7-8	30.4%	29.1%	4.5%	33.3%	30.9%	
	More than 8	7.6%	5.5%	13.6%	3.1%	8.2%	
The degree of Pain	Mild (0-3)	33.3%	16.7%	0%	50%	0%	0.012
	Moderate (4-6)	41%	25.3%	10.8%	22.9%	0%	
	Severe (7-10)	21.4%	21.4%	7.9%	48.6%	0.7%	

Discussion:

OTC analgesics are commonly prescribed and consumed drugs in Jordan. There are no hard restrictions on their prescription and can easily be reached by consumer. If used properly the side effects will be minimized with maximum benefits. This means that the impact of proper use, correct administration, and effective public awareness is an important consideration for both drug effectiveness and avoidance of their complications.

The results of the present study indicate the influence of daily habits and stress levels on the consumption of OTC analgesics as well as the knowledge and awareness about over-the-counter analgesics use and side effects among University Students.

There was no significant difference in stress levels between males and females. Most of the students were in the high stress group (stress scale ≥ 20) and there was no significant difference in stress scales among students in different academic levels. In addition, there was no significant difference in stress levels among students from different colleges. However, the monthly income for participants significantly affect their stress scale.

There was a significant direct relationship between the amount of analgesic intake and the stress scale. In addition, as the degree of pain increases the amount of analgesic intake increases too.

Although there was no significant differences in stress scales among participants with different daily coffee or Nescafe intake, there was a significance difference between coffee intake and analgesic use. Participants who do not drink coffee uses analgesics more frequently.

Consistent with previous study conducted in Jeddah, Saudi Arabia¹², medical students were found to use OTC analgesics more frequently compared to students from other faculties.

It was seen that OTC analgesics associated significantly with stress status and this can be justified as people may consider the emotional

changes as a disease problem that will respond to analgesics.

The awareness of participants regarding the side effects of OTC analgesics was in direct relationship with their academic level. As the academic level of the participant increased, the awareness regarding the analgesic side effects increased.

Conclusion:

Females were found to be more educated than males about significant harms of these analgesics such as paracetamol and ibuprofen on liver and stomach, respectively. In addition, they were more aware about the correct use of Ibuprofen regarding meals. Interestingly, females take analgesics significantly higher than males. Overall, more females used non-prescription analgesics than males¹⁰ as they exhibit greater pain sensitivity, enhanced pain facilitation and reduced pain inhibition compared with men¹¹.

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