

The Effect of the Abuse of Over-the-counter Medications on the Nutritional Status of the University of Eastern Africa, Baraton Students

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Abstract

Background: Society and in turn students have a misconception towards the use of medications to enhance performance. The constant abuse of these drugs is suspected to create complications with the nutritional status of individuals. The problem is that little research is available for students in the East African region. This research aims to determine the correlation between abuse of over-the-counter medications and the nutritional status of students at the University of Eastern Africa, Baraton. The study shall assist in filling the information gap.

Methods: The aim of the study was to obtain insight on the abuse of prescription medication and the effect that it has on dietary patterns. It was a cross-sectional survey study design and was done at the University of Eastern Africa, Baraton with a population of 3124 students in total. A sample size of 377 was formulated using Cochran's formula. 51% of the sample population being female. The study spanned over 3 months and online questionnaires were used. Results were analyzed using SPSS.

Results: 62% abused over-the-counter medications; 66% falling in the normal BMI range. It was found that while the student body heavily participated in the abuse of over-the-counter medications; however, there was no significant correlation with poor nutritional status. This was due to the BMI Vs. prescribed medication p value being at 0.103 when the CI is at 0.05. The correlation between appetite and over-the-counter medications is statistically significant at the 5% level of significance (p-value 0.00114).

Discussion: The implication is that while appetite is affected by these medications, the nutritional status of the University of Eastern Africa, Baraton students remains unscathed. There were several limitations including recall bias and non-returning of questionnaires which may have affected the overall results. An East African perspective has effectively been added to the research pool.

Conclusion: The students are affected by the abuse of OTC medications, but the effect is miniscule on their nutrition status.

Keywords: abuse; medication; nutritional status; cochran's formula; dietary pattern

Introduction

Statement of the Problem

This research aims to study students with regard to their relationship with medications. This is an issue that needs to be addressed and has been researched in part but no data has been gathered on the University of Eastern Africa, Baraton students. 50% of students with attention deficit hyperactivity disorder (ADHD) in the University of Texas that have prescribed medication for their condition are pressured to share their medication with those that don't have the condition. It was found that the use of 'study drugs' is a plague that is more invisible and rarely looked at. These types of medications are in common pharmaceutical flow with most of them being over-the-counter medications,

which are sadly not monitored keenly. The easy access to these medications actually causes a bigger issue- drug addiction (Nimra, 2016). The students in the University of Eastern Africa, Baraton are in uncharted territory and there is a need to study this topic further. The addictive nature of these drugs poses a unique strain on mitigating the efforts to stop their abuse; they aren't even regarded as 'narcotics' though their effects are grave to the human body. Self-medicating also is another factor leading to the vice in universities today. According to the Oxford Dictionary, self-medication is the use of medicines by people who did not take professional advice. The drugs affect the moods, demeanor of the students; it can even change their preferences in what they consider to be proper

nutritious food, their mealtimes and appetite. That, plus the stress that is associated with education, the stress involved of a social nature leading to the use of medications inappropriately to cope. Preventative measures are more the reason for the survey and the recommendations formed will help to solve this issue. The need for further research is appalling, it is like the need for the research supersedes the actual information on ground.

The purpose of this study/ survey wholesomely is to go through the students in the University of Eastern Africa, Baraton and their relationship with drugs in particular over-the-counter medications, and how that affects their nutrition status.

Purpose of the Study

It is to analyze the effect that the abuse of over-the-counter medications has on the dietary patterns and consequently the nutritional status of the students.

Justification

The need for this study to be done in the proposed area; that is, The University of Eastern Africa, Baraton is evident due to the gap in the presence of information in the school or the area surrounding it. Studies have been conducted in various other locations in the world. There is need for research to be done assessing specifically drug use and drug-related negative consequences to inform the development of preventive and clinical interventions (Larimer et al, 2005). Also, the need to create more preventative measures on the abuse of over-the-counter drugs and also showing the social and economic costs of the abuse (Sussman, 2006).

The 'study drugs' that are mood stimulants mostly are seen by students as being slightly less harmful than the soft drinks they consume and not nearly as harmful as drinking beer and smoking; this shows that the need to raise awareness to this issue to aid students understand the importance and the severity of the abuse of the over-the-counter (OTC) drugs. This shows that there is a great need for this survey; especially, in college students in Africa and Kenya particularly (Kotwichi, 2014).

Objectives

The research aims to tackle certain objectives as follows: To know how the nutritional status of the students in the University of Eastern Africa, Baraton is affected through assessing the appetite and BMI of the students after abusing OTC medications.

To know which over-the-counter drugs are more commonly abused by the university students.

The Hypothesis

The researcher aims to prove that the students of the University of Eastern Africa, Baraton that are misusing OTC medications show negative trends in their nutritional status and dietary patterns.

Delimitations Of the Study

Basically, the controlled limitations of this research starts with the choice in topic, the area in which the study is to take place, the time frame of the study (when to collect data, and which method works for that period of time), even the type and number of the sample of population; all of which narrow down the premise of study and makes it easy to go through and implement. In particular, the Baraton University students (both on and off campus students) as the target population; the time frame being 3 months; mode of study being the cross-sectional survey method; the choice in topic being OTC misuse in the school.

Limitations Of the Study

Like in any study, there are factors that affect the research that can't be avoided that negatively affect the results of the study. Here, there are those factors too, like the recall bias of the subjects is the major limiting factor in this study. But, there's also the issue of non-returning questionnaires that may change the results of the study.

Assumptions

The medications remain readily available and in constant flow in the market. The drugs purchased are used inappropriately by most students. The sample population chosen is a proper representation of the total population of the school.

Working Definitions

Over-the-counter medications: In this study, the term basically means drugs on the market that are meant to treat particular condition(s) which are cleared for use by a trained doctor to an individual to aid their immune system to combat the disease. Now, in some cases these medications can be abused by not being taken in the proper way and by the proper ill person. And are sold without a real prescription.

Nutritional status: This is the person's condition in terms of their nutrients and how basically the body is nourished that is symptomized by the well-nourished outlook.

Significance of the Study to Nutrition

The study is important in the nutritional aspect by focusing on the link between the effects of OTC medications ill-intake and the nutritional well-being of the students through affecting their appetite and consequently BMI.

Literature Review

Background

There is a common misconception that the use of prescribed medications, especially stimulants, creates intelligence and in turn better performance. They found that the misuse of medications causes a dependency as well to other illicit drugs and alcohol in American colleges (Amelia & DuPont, 2010).

There's a study that was done in South Africa also found that there is a need to analyze the abuse of medications particularly ones containing codeine. With 2.5% of patients admitted having been due to codeine dependency and only 0.8% of these having codeine as the primary drug. What is even more surprising is that the demographic of people most affected, which is 36.3% of the entire population, are adults between the ages of 20-29 years of age. This basically represents college students' age-group which is a troubling prospect (Dadal, et al, 2015).

In Kenya, there is a need to look into the procedure of which medications are dispensed due to the growing number of people on prescription medications; 14% of the population on at least one drug and 8% of the population on more than one. There is a high use of antidepressants and pain medication in the wrong way and affecting the body in the neurological area. Most common drugs abused would be the opioids, sleep medications, and the like. It shows that there is a great deal of need for regulations to be put into place to deal with the issue of drug misuse (Kizito, 2016).

Over the past three decades, African governments have worked to provide medicines to populations with growing health needs. During that period the World Health Organization has advocated increasing access to medicines. This means there is an increase of medications for distribution, this though is to improve the health of the entire African population.

There has been an issue with the presence of substandard medications in the market of third world countries. These poor-quality medications are also reaching patients because of poor manufacturing and quality-control practices in the production of genuine drugs (either branded or generic). This is an issue that leads to antibiotic resistance that leads to people upping their dosages to get any sort of relief. (Johnston & Holt, 2013).

A study done (Myers et al,2011) which dealt with examining the prevalence and correlates of atypical patterns of drug progression among South Africans, found that 12.2% of the sample reported atypical patterns of drug use progression with the most common violation was the use of extra-medical drugs prior to alcohol and tobacco. Which shows that the medication distribution in Africa is on the rise and still even growing.

Kinds of OTC Medications, Their Abuse, And Nutrition

Drugs that are found on college campuses include over-the-counter drugs like cough medicines containing dextromethorphan or DXM, such as Nyquil or antihistamines (NIDA, 2018). These drugs are taken in order to create a feeling of lightness and maybe taken as an overdose of about 10 pills all at once. That is basically overloading the body with medications and may lead to adverse effects on the body. Warning signs of the abuse of medications may include: - Poor academic performance, drastic changes in weight, isolation, withdrawal from friends and activities, unidentified pill bottles, trouble with the law, traffic accidents, violent outbursts, high-risk sexual behavior, skipping classes, agitation, excessive sleepiness, decreased focus, forgetfulness, lack of motivation, depression.

Tramadol, a drug used as a painkiller that is banned in some countries like Cameroon and yet people still purchase it without a proper prescription from a licensed doctor. And some of the effects include depression, convulsions, euphoria, nervousness and dependence. It does create a state of no pain and hence, used by many motorists in the region (Nankiti, 2016).

A study done to figure out if race-ethnicity and self-esteem form a link to misuse of prescription drugs found that adolescents who used alcohol and marijuana, as teens, are more likely to misuse OTC drugs later on in life. Respondents who previously used alcohol were 26% more likely to misuse prescription drugs in the future, and respondents who previously

used marijuana were 52% more likely to misuse prescription drugs in the future. Showing that those who have high self-esteem are slightly less likely to abuse prescribed medications. Self-medication is regarded as substance abuse used to mask the effects of mental disorders and also causes issues with addiction to various other drugs like alcohol and marijuana. It is a way of dealing with anxiety and stress. The study also showed that in regards to race, the white population are more likely to indulge in drug abuse due to low self-esteem while the other races are not really affected by this factor (Clifford et al, 2015).

The nutritional status, i.e. malnutrition of individuals can be caused by depression and feelings of loneliness. The older adults suffering from depressive symptoms tend to lose their appetite, refuse to eat, and experience weight loss. Depressive symptoms are also associated with unhealthy food choices such as increased intake of foods high in added sugars and lower intake of fruits or vegetables. The food choices of individuals are affected by their emotional state (Jung, 2017).

Individuals affected by these depression characteristics get into unhealthy and drug-based relationships and may consume substances, i.e. prescribed medications' abuse and may also be abused by their substance-addicted spouse as well (Juibari et al, 2018).

There are also other various precursors for malnutrition and issues with weight loss associated with prescription medication misuse. It is a main part of the problem, it stems from the loss of appetite, reduced interest in favorite foods, nausea when eating and "forgetting" to eat. Others who abuse OTC medications find themselves over sleeping with medications like piriton, flu and cough medications (Hanes, 2017).

Another issue that may plague nutrition not necessarily for the individual partaking in the abuse but for the innocent ones, that is; the children who from the pregnancy stage may be affected by the drugs in a sense of them obtaining feeding disorders and being malnourished as a result among many other bodily negative side effects. The use of medication inappropriately could affect more than one person.

OTC medication abuse is just as harmful as narcotic drug abuse if not even more dangerous due to their present abundance in the market these days. The key culprits are antidepressants, pain medications and antibiotics as well. Not all people intend to get 'hooked' to the drugs but eventually get so due to the pain or chronic issues that ail them without even realizing that they are overdosing themselves (Elkins, 2016).

Methodology

Introduction

This section of this paper goes through the process of data collection, analysis stage of the research undertaken. It includes describing the tools, methods of data collection and analysis and therefore, providing a framework for the research.

The framework is important because it provides a sort of backbone for the research and creates a manual that details how to continue with the research. This chapter also discusses the details on the target population, research design and the type of samples to be used.

Research Design

The survey design was ideal to use in this research, it helped the researcher to identify and collect the information in the shortest time possible and also provided good quality information as well without using the whole population. It provided a clear picture of the situation, the effects of prescription medication on the diet patterns of the students in University of Eastern Africa, Baraton. It helped the researcher to summarize, interpret and present the data more easily and effectively.

Target Population and Sample Size

This basically is a section detailing the population used in the study; and being that the researcher hoped to do the research in the University of Eastern Africa, Baraton; the population targeted were the students of the university. Both the off-campus and the on-campus students were ideal for the research and created a clear depiction of the situation. The university has a total population of approximately 3124 students with the current influx of government students, hence, the large size.

The sampling technique used in the research was the Cochran's formula; as noted in several research books like that of Lavrakas (2008), the formula goes as follows: $n^{\circ} = z^2pq / e^2$ it was then corrected by:

$$n = n^{\circ} / [1 + (n^{\circ}-1) / N]$$

Where,

e = margin of error = 0.05

p = estimated proportion of the population = 0.5 $q = 1 - p = 0.5$

N = target population = 3124

n° = Cochran's sample size recommendation = 384

Now, according to the formula using a 95% confidence interval, the sample population was calculated to 342

students in the research in a population of 3124. Which was approximately 10.9% of the entire population of the university. And has an attrition rate which was 10% of the sample population which therefore was 34 students. Which means the researcher aimed to use a total of 377 students as the sample population.

Research Instruments

The researcher used the questionnaire method which had both open-ended and close-ended questions to collect quantitative and qualitative data. The researcher went through the questions with the respondents to ensure that they cover the data and details correctly. A questionnaire is often conducted as paper-based questionnaires, these are questionnaires used to collect data and analyze statistical information using computer software (Uhlig et al, 2014). The researcher however, used an online questionnaire forum known as SurveyMonkey to collect the data required via a mobile phone on kiosk mode.

Validity

Validation is the process of testing a model by comparing model predictions to experimental or clinical data according to Pathmanathan, and Gray (2018). In order to validate the ease of understanding of questionnaire questions and quality of data. A pilot study was conducted in the University of Eastern Africa, Baraton using a smaller group of students (10); the students went through the questionnaire questions on SurveyMonkey and answered them easily and the data was satisfactory, this helped to show the consistency in the instrument used.

Reliability

Reliability is defined as the extent to which scores for persons who have not changed are the same, with repeated measurement under several conditions (Hidding et al, 2016). Since the questionnaire had been used in other studies like (Mendel et al, 2015), it was then tested by the researcher during the pilot study and tested and it came up with similar results as the prior research in which the questionnaire was used.

Data Collection Procedure and Analysis

The data was collected after permission was obtained from the ethics review board of the University of Eastern Africa, Baraton by the researcher to collect data

from the students therein. The questionnaires were filled via the SurveyMonkey application Kiosk mode on a mobile phone; and the data collected and stored online. Every student was requested to consent to providing their data in order for it to be used in the research. Analysis tools used were SPSS, and Microsoft Excel, to analyze, and present the data adequately. The university authority provided the go ahead for the data to be collected due to ethical issues and considerations. Research statistical tools are used to establish a link between an independent variable to a dependent variable as defined by (Heinze et al, 2018). The dependent variable in the study was the nutritional status/ dietary patterns of the students measured using BMI and appetite of students; and the independent variable in the study was the abuse of OTC medications.

Ethical Considerations

Here, the rights and needs of the respondents and their (the participants) rights to autonomy and therefore discretion were held to the highest degree through making sure that the data provided remains confidential and used only for the research.

The participants' consent was obtained in order for the research to be valid and useful; and also, proper information was given to the participants of what they are doing in the research and that ensured the full participation of the participants. To ensure that all these requirements are met, that is where for this study the ethical review board comes in to clear the research as humane and necessary to undertake.

Data Presentation, Analysis and Interpretation of Findings

This chapter shows the research findings which were obtained from the questionnaires distributed to 377 students in the University of Eastern Africa, Baraton of Nandi County, Kenya. The researcher's aim of the research was to establish whether the use of over-the-counter medication inappropriately would affect the nutritional status of students in the University of Eastern Africa, Baraton.

Demographic Characteristics of Respondents

This section of the chapter represents the individual differences in the population through the respondents. Those considered in this study are the gender and residence of the students.

Table 1: Gender and Residence Distribution.

| Residence | Female | Male | Totals |
|-----------|--------|------|--------|
| off | 120 | 128 | 248 |
| on | 71 | 58 | 129 |
| totals | 191 | 186 | 377 |

According to table 1, the majority of the respondents were females totaling 191, the percentage being 51% and the males totaling 186 accounted for 49% of the sampled respondents. Percentage figures rounded off to 66% of respondents lived off-campus and 34% lived on-campus. 63% of the females lived off-campus, and 37% of the female respondents lived on-campus. 69% of males lived off-campus, and 31% of them lived on-campus. 66% of the students lived off-campus grounds, and 34% lived on the school campus.

Relationship Between Bmi and Most Commonly Abused OTC Medications

Table 3: BMI Vs. Frequent OTC Medication Abused Distribution

| | Frequent Meds Used | | | | |
|-------------|--------------------|-------|-------|-------|----------|
| | Antibiotics | Cough | Flu | Pain | Sleeping |
| BMI <18.50 | 9.1% | 17.2% | 30.3% | 25.3% | 18.2% |
| 18.60-24.90 | 13.7% | 13.3% | 38.6% | 23.7% | 10.8% |
| 25.0 - 29.9 | 0.0% | 0.0% | 37.5% | 41.7% | 20.8% |
| 30.0+ | 0.0% | 0.0% | 40.0% | 40.0% | 20.0% |
| Total | 11.4% | 13.3% | 36.3% | 25.5% | 13.5% |

It was found that students with BMI (kg/m^2) <18.5 were 99; 18.6-24.9 were 249 (66% of the total respondents); 25.0-29.9 were 24; >30.0 were 5 in total number. Respondents with BMI <18.5 kg/m^2 used flu medications the most 30% of them. Majority of the students were falling in the normal BMI range of 18.6-

24.9 kg/m^2 . Most common medications used by the respondents were flu medications 36.3% followed by pain medication (25.5%), sleeping pills (13.5%), cough medications (13.3%), and antibiotics (11.4%) came lowest number.

Table 4: Chi-Square Tests (BMI VS. Commonly Abused OTC Medications)

| | Value | df | Asymp. Sig. (2-sided) |
|--------------------|---------------------|----|-----------------------|
| Pearson Chi-Square | 18.430 ^a | 12 | .103 |
| Likelihood Ratio | 24.836 | 12 | .016 |
| N of Valid Cases | 377 | | |

There was not a significant relationship between the most commonly used medications and the BMI of the students at a p-value of 0.103 which is not significant at a level of confidence of 0.05.

This may be because of influences caused by other factors like the residence of the students whether it be off or on the campus grounds. Most off-campus

students generally do not cook nutritious meals as the food provided by the cafeteria for on campus students due to time schedules of classes and even the price of food stuff in the market. This is because of the poverty margin of off-campus students being higher than that of the students on-campus. And the extra bills they have to pay like water, electricity and the like.

Relationship Between Abuse of Prescribed Medication on The Appetite of Students

Table 5: Chi-Square Tests

| | Value | df | Asymp. Sig. (2-sided) |
|--|-------|----|-----------------------|
| | | | |

| | | | |
|--------------------|---------------------|---|------|
| Pearson Chi-Square | 23.222 ^a | 4 | .103 |
| Likelihood Ratio | 29.578 | 4 | .016 |
| N of Valid Cases | 377 | | |

Table 5 shows the relationship between frequent medications used and the appetite of respondents thereafter. The p-value is 0.00114 which is significant because it is <0.05 significance. There is most definitely a correlation between the medications mostly consumed by the respondents and their appetite after using the drugs.

The research considered BMI and appetite for food after intake of the most common medications to establish that the students' nutritional status was being affected. However, the results showed that inasmuch as the appetite was affected by the OTC medications being taken inappropriately; the BMI of the student was not affected by the abuse of the OTC medications. The medications mostly used were flu, pain, sleeping medications respectively from highest to lowest. And the antibiotics and cough medications having least frequency in usage by the respondents.

Summary Conclusion and Recommendations

This chapter represents the summary of the findings of the study; conclusions and the recommendations.

Summary of Findings

The majority of respondents were female accounting to 51%; and living off-campus grounds were 66%. The students largely use medications over-the-counter without prescription/advice accounting for 62% of the sample population; and the most used medication consumed by the students are flu medications.

The BMI of students were between 18.6–24.9 with a percentage of 66% of the total respondents falling in this normal range. Most common medication used by the respondents were flu medications 36.3% followed by pain medication (25.5%), sleeping pills (13.5%),

The study found that there was a correlation between nutritional status of the respondents who consumed medication without medical advice and reducing the respondents' appetite for food after consuming the medication. This conclusion is statistically significant at the 5% level of significance (p-value 0.00114). However, there was no relationship between BMI and commonly abused medications by students since p value was 0.103 which is not significant at 0.05 CI.

Conclusion

Students in the University of Eastern Africa, Baraton are most certainly misusing OTC medications and consequently, they have issues in regard to appetite; as in the students lack the appetite to eat food usually after taking part of the medications. Most of the students do not obtain prescriptions and do not see the need to do so.

The BMI of students is not however, affected much by the medications and that could be caused due to the fact that the online questionnaire provided by the researcher did not create room for accuracy in terms of height and weight since measurements were not taken but required respondents to recall their own measurements. And also, other factors like where the students are living, and how much money they have to sustain their diets.

The students are affected by the abuse of OTC medications, but the effect is miniscule on their nutrition status.

Recommendations To the University of Eastern Africa, Baraton and Pharmacies Surrounding the Institution
The researcher found the following recommendations would be useful from the survey taken; The researcher recommended that the pharmacists offering over-the-counter medication to the students must first require them to produce some kind of medical advisory form to ascertain that the medication to be obtained are necessary and to be used for the illness for which it is intended.

The researcher further recommended open seminars on the proper use of medications should be held in order to teach the students the benefits of medication, and also, their dangers of addiction.

Declarations

Author Contributions

Neema Dumo contributed to the research paper in collecting data; organizing and analyzing the same. The concept of the paper was done by N.D and was supervised by Dr. Hellen Ndiku and N.D documented the results and drafted the manuscript.

Competing Interest

The author reports no competing interests.

N.D received research support from the University of Eastern Africa, Baraton. N.D received a bachelor's degree from the University of Eastern Africa, Baraton.

Ethics Approval and Consent to Participate

The Research Ethics Committee of the University of Eastern Africa, Baraton approved the study. The approval number allocated is UEAB/REC/09/01/2020; and since the study occurred at the same institution no further permission was required. A copy of the approval is slotted in the appendix section of the paper. All participants in the study also had to provide signed consent before completing the questionnaire prepared by the researcher.

Availability of Data and Materials

The data pertaining to this research are not openly available due to the nature of the research. Participants' information provided could compromise their privacy; therefore, to access the data is best done by directly contacting the corresponding author.

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Consent for Publication

I, Neema Dumo, give my consent for the publication of identifiable details, which includes charts, graphs, case history and/or details within the text to be published as an article in the Nutrition Journal.

Trial registration: N/A.

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