

The Use of Stimulants and Complementary Medicine to Enhance Mental Alertness by Health Sciences Students at the University of Johannesburg

Potgieter A, Razlog R, Caminsky M

University of Johannesburg, Faculty of Health Sciences, Department of Homoeopathy

Abstract

The aim of this study was to determine the use of stimulants and complementary medicine (CM) to enhance mental alertness by Health Sciences students at the University of Johannesburg (UJ). This research was a quantitative-descriptive, survey design study. A total of 400 questionnaires were distributed to Health Sciences students between the ages of 18-40, who were registered at UJ for the 2016 academic year. The survey took place at the UJ Doornfontein campus; participation was voluntary and consent was given by participants prior to filling in the questionnaire. The questionnaire took approximately 5-10 minutes to complete. Data from the questionnaires was captured by the researcher and analysed using frequencies and column table analysis. The typical participant was female (74.7%), between the age of 18-20 (49.8%), of African race (58.3%), and in her first year of study (55.8%). Health concerns for mental alertness indicated that 84.3% of participants experienced a decrease in concentration or attention and 51% experienced low energy. Use of CM or stimulant-containing products was reported by 64% of participants. Awareness of any possible negative effects of CM or stimulant-containing products was reported by 42.0% of participants; while 17.8% were not aware of any possible negative effects and 40.3% were unsure of any possible negative effects. Participants most commonly made use of energy drink, caffeine, and vitamins and supplements to enhance their mental alertness. The outcomes of the study showed that there is a need for further education on CM and stimulant-containing products for students.

Introduction

Students are constantly under stress when studying and this can have an effect on their mental and physical health. This may result in fatigue and a lack of mental performance and can lead to a decrease in concentration, forgetfulness, confusion and burnout (Andreatta, 2012). Students experience increased pressure to perform at university. These pressures may be financial, keeping up with their workload, or improving their academic performance (Sayarifard and Sayarifard, 2013). As a result, students may use a wide range of complementary medicines (CM) or stimulants to increase their mental alertness or to treat their mental fatigue. The most

commonly used treatments may include stimulants, such as caffeine and energy boosters, and vitamins and supplements (Alsunni, 2015).

A systematic review of peer-reviewed studies provided data on rates of CM usage among students. It was suggested that further research was necessary to address the limitations found in these studies. It was recommended that further health education pertaining to CM should be targeted towards these students (Nowak and Hale, 2012). CM products are readily available to students; however, students may not know all the risks and side effects of these products or the interactions between products, and may therefore prescribe incorrectly or over-prescribe (Mohamed, 2014). Previous research indicates that students are not familiar with CM, but many ingest CM substances on the basis of self-medication and without sufficient knowledge. Therefore, it is important for health educators and medical professionals to be aware of CM use by students or patients, to ensure the effective and safe use of these products (Ujiie and Okada, 2015).

While there is much research on the use of CM, little research is focused on CM use in enhancing mental alertness. Therefore, many students may be making use of these products without sufficient knowledge of the products. Students require knowledge on the benefits, side effects and interactions of these products, so that they may make informed decisions on which products to use and how to use them. The importance of this study is supported by findings in previous studies as mentioned in the problem statement (Nowak and Hale, 2012).

The findings of this study show which CM products and stimulants are most commonly used to enhance mental alertness by UJ Health Sciences students and highlights their perceived awareness of any possible negative effects of these products. This indicates where further education on CM products is needed and whether health educators should discuss the safety and risks of CM product use with students and educate them on choosing reputable CM providers.

Materials and Methods

The research sample consisted of 400 participants, from a pool of approximately 3780 students, from the Faculty of Health Sciences registered at UJ for the 2016 academic year.

Participants were included in the study if they were:

- Between the ages of 18-40; and

- Currently registered Health Sciences students at UJ.

The research took place at the UJ Doornfontein campus (DFC) with relevant permission obtained. The research was a quantitative-descriptive, survey design study. Participation was voluntary and consent was given by participants. The questionnaire took approximately 5-10 minutes to complete. The questionnaire used in this study was adapted from the Complementary and Alternative Medicine (CAM) Survey which was used in a study conducted in Johannesburg by Snyman (2014), as well as a study conducted in Cape Town by Du Plessis (2013), and was deemed as valid and reliable from these studies. The survey questionnaire was tested by a pilot study with a small sample group, of which the results were not analysed. The pilot study was completed prior to the running of the study and was done by students in the Homoeopathic Health Centre at DFC, UJ. Participants took approximately 5-10 minutes to complete the questionnaire. Changes were made to any questions which were ambiguous and where the meaning of the question was unclear.

Data from the questionnaires was captured by the researcher. The data obtained throughout the study was statistically analysed with the assistance of STATKON, UJ, by using frequencies and column table analysis (Kuhudzai, 2015). Data presented provided information on CM usage and the understanding of CM usage by Health Sciences students at UJ.

Participation in this survey was voluntary. Participants were not required to disclose any personal or identifying information and anonymity was ensured as participants were not required to place their names on the questionnaire. Participants were provided with an information leaflet explaining the purpose and procedures of the study, and were asked to sign a Consent Form prior to filling in the questionnaire. Participants completed the questionnaire independently to avoid any bias or influence by the researcher or any other person. A private setting was available to complete the questionnaire if the participant preferred one. Participants were able to request the results of the study after its completion. There were no anticipated risks of being involved in the study.

Results

Analysis of the results indicated a total of 101 (25.3%) male participants and 299 (74.7%) female participants who completed the questionnaire. There were 199 (49.8%) participants age 18-20, 161 (40.3%) age 21-25, 22 (5.5%), age 26-30, 8 (2.0%) age 31-35, and 10 (2.5%) age 36-40. A

total of 233 (58.3%) participants were African, 112 (28%) were Caucasian, 11 (2.8%) were Coloured, 35 (8.8%) were Indian, and 9 (2.3%) indicated that they were from other racial groups. Participants were asked to rate their general health status. An 'episode' referred to an incident of ill health that interfered with their daily activities. A total of 93 (23.3%) participants were of perfect health, 142 (35.5%) had one episode a year, 142 (35.5%) had a few episodes a year, 18 (4.5%) had an episode every month, 4 (1.0%) had a few episodes a month, and 1 (0.3%) had health problems all the time.

Participants were asked to identify areas of health concern for mental alertness and more than one option could be chosen. A total of 52 (13.0%) participants said they experienced fogginess or dullness, 220 (55.0%) experienced a decrease in concentration, 117 (29.3%) had a decrease in attention, 139 (34.8%) experienced forgetfulness, 204 (51.0%) felt that they had low energy, and 103 (25.8%) experienced mood instability.

Participants listed the following as other health concerns that they experienced:

- Interrupted sleep;
- Decreased motivation (2);
- Over-thinking; and
- Headaches.

Participants were asked if they had made use of CM or stimulant-containing products previously. There were 144 (36.0%) participants who had not made use of CM or stimulant-containing products for their health concerns, and 256 (64.0%) participants who had made use of CM or stimulant-containing products.

Participants who said that they did not make use of CM products or stimulant-containing products were able to state why they didn't use them. Of these, 6.2% of participants did not give a response. Responses were coded and decoded into various themes (Centre for Evaluation and Research, 2012). The following themes were found:

- Ineffectiveness of the products (19);
- Possible drug interactions or side-effects (46);
- Cost or time constraints (15);
- Unnecessary or unneeded (33);
- Lack of knowledge (12); and

- Personal preference (10).

Participants were also asked whether the CM or stimulant-containing products they had used, were prescribed by a practitioner or if they were self-prescribed. A total of 154 (38.5%) participants did not make use of any prescribed or self-prescribed products, 25 (6.3%) said that the products were prescribed by a practitioner, 209 (52.3%) said that the products were self-prescribed, and 12 (3.0%) said that different products were either prescribed by a practitioner or were self-prescribed.

Participants were asked to identify which products they had used previously and more than one option could be chosen. A total of 3 (0.8%) participants had previously used aromatherapy, 19 (4.8%) had used Ayurveda, 64 (16.0%) had used caffeine, 2 (0.5%) made dietary changes, 145 (36.3%) had used energy drinks, 47 (11.8%) had used herbal preparations, 36 (9.0%) had used Homoeopathy, 13 (3.3%) had used Unani-Tibb, 64 (16.0%) had used vitamins or supplements, and 133 (33.3%) had not previously used any CM or stimulant-containing products.

Participants were asked to identify which products they used on a regular basis and more than one option could be chosen. A total of 2 (0.5%) participants used aromatherapy, 14 (3.5%) used Ayurveda, 49 (12.3%) used caffeine, 5 (1.3%) made dietary changes, 54 (13.5%) used energy drinks, 20 (5.0%) used herbal preparations, 17 (4.3%) used Homoeopathy, 6 (1.5%) used Unani-Tibb, 47 (11.8%) used vitamins or supplements, and 224 (56.0%) did not use CM or stimulant-containing products on a regular basis.

Participants were asked to identify which products they found to be effective in treating their health concerns and more than one option could be chosen. A total of 2 (0.5%) participants selected aromatherapy, 15 (3.8%) selected Ayurveda, 49 (12.3%) selected caffeine, 5 (1.3%) selected dietary changes, 79 (19.8%) selected energy drinks, 29 (7.3%) selected herbal preparations, 24 (6.0%) selected Homoeopathy, 7 (1.8%) selected Unani-Tibb, 45 (11.3%) selected vitamins or supplements as an effective treatment option. 182 (45.5%) did not find CM or stimulant-containing products effective.

Participants were asked if they were aware of any possible negative effects from using CM or stimulant-containing products. A total of 168 (42.0%) of participants were aware of possible negative effects from using CM or stimulant-containing products, 71 (17.8%) were not aware of any negative effects, and 161 (40.3%) were unsure of any possible negative effects.

Participants were asked to identify where they acquired their knowledge on CM or stimulant-containing products and more than one option could be chosen. A total of 78 (19.5%) participants acquired their knowledge from a CM practitioner, 208 (52.0%) from family or friends, 108 (27.0%) from lectures, 65 (16.3%) from health consultants at health shops, 95 (23.8%) from books, 203 (50.8%) from the internet, 57 (14.3%) from magazines, 48 (12.0%) from their general practitioner (GP), and 64 (16.0%) from a pharmacist.

Participants were asked to identify which CM practitioners they had previously consulted and more than one option could be chosen. There were 10 (2.5%) participants who had consulted an Ayurvedic doctor, 26 (6.5%) who had consulted a herbalist (phytotherapist), 135 (33.8%) who had consulted a homoeopath, 12 (3.0%) who had consulted a naturopath, 18 (4.5%) who had consulted a TCM practitioner, and 222 (55.5%) who had not consulted a CM practitioner.

Conclusions and Recommendations

Mental health is a rising concern for students and is affected by many pressures that students face on a daily basis (Sayarifard and Sayarifard, 2013). Analysis of the results shows that mental fatigue is a common occurrence amongst students. Health concerns for mental alertness indicated that 55.0% of participants experienced a decrease in concentration, 29.3% experienced a decrease in attention and 51% experienced low energy. These results relate to mental fatigue and the effects of long periods of studying as seen by Andreatta (2012).

Many students are, however, weary as to the effects of stimulant-containing products and are commonly unsure of which CM products to make use of. The use of CM and stimulant-containing products are most commonly on the basis of self-diagnosis and self-medication. Awareness of any possible negative effects was seen by 42.0% of participants; while 17.8% were not aware of any possible effects and 40.3% were unsure of any possible negative effects. These results correlate to those found by Mohamed (2014) that state that students made use of CM products without knowing any potential risks or side-effects of the products. Studies have found that students self-prescribed on the basis of their own knowledge for various reasons. These reasons were that their symptoms were not serious and they wanted to avoid the long waits at doctors. The study by Lukovic *et al.* found that stimulants were commonly self-prescribed by fifth and sixth year students due to their academic load and stress (Lukovic *et al.*, 2014). It was previously believed that the common reason for self-medication was a lack of time and available resources. However, due to technology and the increase of information found easily on the

internet, students self-medicate on the basis of self-knowledge through these medias (Sodhi *et al.*, 2016).

After analyses of the results, it can be concluded that there is a general lack of knowledge on the use, interactions and side-effects of CM and stimulant-containing products. These findings are consistent with those found in other studies. As a result, the use of these products was low and the perceptions of these products are often viewed in a negative light. Other factors such as time and financial constraints also play a role in the low use of CM or stimulant-containing products. Students were often unaware of the benefits of these products for their mental health concerns.

It was seen that energy drinks and caffeine were most commonly used. These results are consistent with other studies. However, the effects of these products weren't often known and thus may present a safety risk for students' overuse of these products and possible tolerances which may have been developed. Research has shown that students who make use of energy drinks on a regular basis do so for reasons such as increasing physical performance, help in studying, to decrease fatigue, and to combat sleepiness. Students who made use of energy drinks experienced effects such as increased concentration, increased energy, less sleepiness, increased muscle strength, and they felt happier (Bulut *et al.*, 2014).

A study done on medical students at the University of the Free State found that caffeine consumption increased from first year to third year students, with third year students consuming the highest amounts of caffeine. This study also showed that there were misconceptions on the benefits and side-effects of caffeine. Students were making use of caffeine without sufficient knowledge on the benefits and side-effects. It was suggested that programmes should be put in place to improve students' knowledge of caffeine and its safe use (Lee *et al.*, 2009).

Results also showed that friends or family and the internet were the main sources of information for students. Through information and communication technology (ICT), there is a growing interest by students to educate themselves and thus allow themselves to make their own decisions pertaining to their health. Modern society has developed a more technology based culture and therefore sources of information on the internet are vast. The use of ICT has increased over the last few years. The use of ICT by students and healthcare professionals is also on the increase. However, inadequate ICT skills may lead to its incorrect use. Research shows that majority of students have access to the internet and these students know how to use

computers. Students show a willingness to learn about ICT and its correct use. Therefore, universities should educate students on how to use ICT effectively so that they may know where to find information and which sites provided reputable information (Dery *et al.*, 2016).

The following may be of value for further research in this area:

- A larger sample group to allow for further validation of these results;
- A more equal spread of participants between the different departments in the Faculty of Health Sciences;
- Focusing on a single year of study rather than including all years of study as academic challenges are different and stress levels increase with year of study;
- Expanding the research to students from all faculties at the University of Johannesburg and to other universities to get a more comprehensive reflection on the use of CM and stimulant-containing products by students; and
- Separating the study to focus on either CM products or stimulant-containing products.

References

Alsunni, A. 2015. Energy Drink Consumption: Beneficial and Adverse Health Effects. *International Journal of Health Sciences*. [ONLINE]. 9(4), 468-474. Available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4682602/>. [Accessed 19 February 2016].

Andreatta, B. 2012. *Navigating the Research University: A Guide for First-Year Students*. 3rd ed. Boston, USA: Wadsworth Cengage Learning. [ONLINE]. Available at: https://books.google.co.za/books?hl=en&lr=&id=VeI8AAAAQBAJ&oi=fnd&pg=PR3&dq=andreatta+navigating+the+research+university&ots=SkuvnSFell&sig=9kuwU-_REIy6wPWLKDrVsHQbZFU#v=onepage&q=andreatta%20navigating%20the%20research%20university&f=false. [Accessed 28 October 2016].

Bulut, B., Beyhun, N.E., Topbas, M. and Can, G. 2014. Energy Drink Use in University Students and Associated Factors. *Journal of Community Health*. [ONLINE]. 39, 1004–1011. Available at: <http://0-web.b.ebscohost.com.ujlink.uj.ac.za/ehost/pdfviewer/pdfviewer?sid=117cfec0-44d2-4b6f-81d3-7361531992e7%40sessionmgr107&vid=0&hid=115>. [Accessed 30 October 2016].

Center for Evaluation and Research. 2012. *Tips & Tools #18: Coding Qualitative Data*. [ONLINE]. Available at: http://programeval.ucdavis.edu/documents/Tips_Tools_18_2012.pdf. [Accessed 17 November 2016].

Dery, S., da-Costa Vroom, F., Godi, A., Afagbedzi, S. and Dwomoh, D. 2016. Knowledge and Use of Information and Communication Technology by Health Sciences Students of the University of Ghana. *Ghana Medical Journal*. [ONLINE]. 50 (2), 180-188. Available at: <http://0-web.a.ebscohost.com.ujlink.uj.ac.za/ehost/pdfviewer/pdfviewer?sid=59fad346-b862-49f0-84a1-f9b89fb4822c%40sessionmgr4009&vid=0&hid=4209>. [Accessed 29 October 2016].

Du Plessis, S. 2013. *A Survey to Determine the Attitudes Towards Complementary and Alternative Medicine by Users in Cape Town*. [Unpublished]: University of Johannesburg. Retrieved from: <https://ujcontent.uj.ac.za/vital/access/manager/Repository/uj:7463?queryType=vitalDismax&query=Du+Plessis+complementary+medicine>. [Accessed 27 April 2016].

Kuhudzai, A. 2015. *STATKON*. Personal conversation on 11th September 2015. akuhudzai@uj.ac.za, 20 Chiselhurst Avenue Kingsway Campus, (011) 559 4407.

Lee, K.H., Human, G.P., Fourie, J.J., Louw, W.A.N., Larson, C.O. and Joubert, G. 2009. Medical Students' use of Caffeine for 'Academic Purposes' and their Knowledge of its Benefits, Side-effects and Withdrawal Symptoms. *South African Family Practice*. [ONLINE]. 51(4), 322-327. Available at: <http://0-www.tandfonline.com.ujlink.uj.ac.za/doi/abs/10.1080/20786204.2009.10873872>. [Accessed 13 September 2016].

Lukovic, J.A., Miletic, V., Pekmezovic, T., Trajkovic, G., Ratkovic, N., Aleksic, D. and Grgurevic, A. 2014. Self-Medication Practices and Risk Factors for Self-Medication among Medical Students in Belgrade, Serbia. *PLoS ONE*. [ONLINE]. 9 (12), 1-14. Available at: <http://0-web.a.ebscohost.com.ujlink.uj.ac.za/ehost/pdfviewer/pdfviewer?sid=ea31e468-9cf5-497a-ab25-c9cd7500edfd%40sessionmgr4010&vid=0&hid=4209>. [Accessed 29 October 2016].

Mohamed, A.D. 2014. Neuroethical Issues in Pharmacological Cognitive Enhancement. *WIREs Cognitive Science*. [ONLINE]. 5 (5), 533 - 549. Available at: <http://onlinelibrary.wiley.com/doi/10.1002/wcs.1306/full>. [Accessed 14 April 2016].

Nowak, A. L. and Hale, H. M. 2012. Prevalence of Complementary and Alternative Medicine Use among U.S. College Students: A Systematic Review. *American Journal of Health Education*. [ONLINE]. 43 (2), 116 - 126. Available at: <http://0-web.a.ebscohost.com.ujlink.uj.ac.za/ehost/detail/detail?vid=7&sid=823a2d3a-fa14-4682-b169-70ab400294d8%40sessionmgr4001&hid=4114&bdata=JnNpdGU9ZWhvc3QtbGl2ZSdzY29wZT1zaXRI#AN=EJ979303&db=eric>. [Accessed 1 June 2016].

Sayarifard, A. and Sayarifard, E. 2013. Identifying and Ranking the Factors Affecting the University Students' Mental Health. *Current Research Journal of Biological Sciences*. [ONLINE]. 5(4), 168-176. Available at: <http://maxwellsci.com/print/crjbs/v5-168-176.pdf>. [Accessed 28 October 2016].

Snyman, W. 2014. *A Survey to Determine Attitudes and Perceptions of Complementary and Alternative Medicine Users in Johannesburg Health Shops*. [Unpublished Mastered Dissertation]: University of Johannesburg. Retrieved from: <https://ujdigispace.uj.ac.za>. [Accessed 14 January 2016].

Sodhi, A., Tadiparthi, J. and Patil, B.A. 2016. Is the Practice of Self Medication More Prevalent Among Health Sciences Students? A Comparative Questionnaire Study. *Indian Journal of Medical Research & Pharmaceutical Sciences*. [ONLINE]. 3 (7), 44-47. Available at: <http://0-web.a.ebscohost.com.ujlink.uj.ac.za/ehost/pdfviewer/pdfviewer?sid=2756fd78-c226-40bf-90a9-726ea83969dc%40sessionmgr4007&vid=0&hid=4209>. [Accessed 29 October 2016].

Ujiie, Y. and Okada, H. 2015. Factors Affecting the Use of Complementary and Alternative Medicine among Japanese University Students. *Journal of Complementary & Integrative Medicine*. [ONLINE]. 12 (1), 89. Available at: <http://0-web.a.ebscohost.com.ujlink.uj.ac.za/ehost/detail/detail?vid=5&sid=823a2d3a-fa14-4682-b169-70ab400294d8%40sessionmgr4001&hid=4114&bdata=JnNpdGU9ZWhvc3QtbGl2ZSdzY29wZT1zaXRI#AN=100857826&db=s3h>. [Accessed 1 June 2016].