Original Article

Impact of Energy Drinks on Students' Health and Academics at a Private Nursing College

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Abstract

Background:

Energy drinks are increasingly consumed by college students in Pakistan, primarily for enhanced alertness and academic stamina. However, their potential cardiovascular effects and influence on academic performance remain controversial.

Aim:

This study aimed to assess the short-term effects of energy drink consumption on academic performance and cardiovascular indicators, including blood pressure and pulse rate, among nursing students in Pakistan.

Methods:

A randomized controlled experimental design was used. From 193 nursing students in Karachi, 50 habitual energy drink consumers were randomly selected and assigned to either an experimental group (received a commercial energy drink) or a control group (received bottled water). Pre- and post-intervention measures included systolic/diastolic blood pressure, pulse rate, and academic performance via standardized tests.

Results:

The experimental group showed an increase in mean systolic blood pressure from 119 to 125 mmHg and diastolic pressure from 70 to 74 mmHg. No significant changes were observed in pulse rate or academic performance within the group. However, systolic and diastolic blood pressure differences between the experimental and control groups were statistically significant ($p < 0.05$). Academic performance showed no significant difference between groups.

Conclusion:

Energy drink consumption among Pakistani nursing students may elevate cardiovascular indicators such as blood pressure but does not significantly impact academic performance in the short term. These findings highlight the need for awareness campaigns about the potential health risks of energy drink use.

Keywords:

Energy Drinks, Academic Performance, Blood Pressure, Heart Rate, Nursing Students, Pakistan

Introduction:

Energy drink consumption has become increasingly prevalent among college students in Pakistan, mirroring global trends. These beverages are often consumed to combat fatigue, enhance concentration, and support late-night study sessions. Their popularity stems from key stimulants, primarily caffeine, which are known to influence mood and alertness (7). However, regular consumption may lead to dependency and overuse (9), potentially resulting in adverse psychological and physiological effects such as anxiety, sleep disruption, and dehydration (15).

Although energy drinks are widely marketed as performance enhancers, research remains limited concerning their immediate academic benefits, especially within the Pakistani student population. This study aims to address that gap by examining the impact of energy drink consumption on cardiovascular parameters and academic performance among nursing students in Karachi, Pakistan.

The objectives of this study were to evaluate the effects of energy drink consumption on systolic and diastolic blood pressure among nursing students in Pakistan, to measure any changes in pulse rate following intake, and to assess the short-term impact on academic performance. Additionally, the study aimed to compare both physiological indicators and academic outcomes between students who consumed energy drinks (experimental group) and those who did not (control group). The research questions and hypotheses guiding this study were adapted from the original version and contextualized to reflect the experiences and environment of Pakistani college students.

Methods:

The study followed a randomized, controlled experimental design and was conducted at a nursing college in Karachi. A pre-test/post-test approach was used to compare outcomes between an experimental group (who consumed energy drinks) and a control group (who did not). From a population of 370 students, 193 were selected using Taro Yamane's sampling method. A screening survey was then used to identify habitual energy drink users, and 50 of these participants were randomly allocated to either the experimental or control group. Data were gathered using an automatic digital blood pressure monitor, a demographic questionnaire, and a standardized academic test. Participants were instructed to abstain from caffeine for 48 hours prior to the experiment. On the day of testing, baseline measurements of blood pressure, pulse rate, and academic performance were recorded. The experimental group was provided with a commercially available local energy drink (such as Sting or Monster), while the control group received bottled water. Follow-up measurements were taken at specified intervals to monitor changes. Data were analyzed using SPSS v26, employing both descriptive statistics and paired/independent samples t-tests to interpret the results.

Results:

The demographic data indicated that participants ranged in age from 16 to 32 years. A majority (58%) were between 21 and 25 years old. Females comprised 66% of the participants, while males made up 34%. Additionally, 93% of the students identified as single.

In terms of physiological measures, the experimental group showed an increase in mean systolic blood

pressure from 119 mmHg to 125 mmHg after consuming energy drinks, while the control group exhibited a slight decrease from 122 mmHg to 121 mmHg. Diastolic pressure also increased in the experimental group, from 70 mmHg to 74 mmHg, whereas the control group decreased from 68 mmHg to 67 mmHg. Pulse rate in the experimental group rose slightly from 74 to 75 beats per minute, while it

remained unchanged in the control group at 73 beats per minute.

Paired t-tests within the experimental group revealed no statistically significant changes in systolic blood pressure (p = 0.160), diastolic blood pressure (p = 0.340), or pulse rate (p = 0.450). However, independent t-tests comparing the experimental and control groups showed significant differences in both systolic (p = 0.030) and diastolic blood pressure (p = 0.032), though pulse rate remained statistically insignificant between groups (p = 0.165).

Regarding academic performance, the mean score in the experimental group increased from 87% to 91% following energy drink consumption. In contrast, the control group showed a decline from 79% to 75%. Despite this, a paired t-test indicated no statistically significant improvement in academic performance within the experimental group (p = 0.640), and the independent t-test between groups also showed no significant difference in post-test academic scores (p = 0.165).

Table 1 Changes in systolic and diastolic blood pressure and pulse rate before and after energy drink consumption among experimental and control groups.

Measure	Experimental Group (Pre)	Experimental Group (Post)	Control Group (Pre)	Control Group (Post
Systolic BP (Mean)	119	125	122	121
Diastolic BP (Mean)	70	74	68	67
Pulse Rate (Mean)				74 75 73 7

BP = Blood Pressure; bpm = beats per minute. Values are group means rounded to the nearest whole number.

Table 2 Comparison of within-group and between-group differences in cardiovascular indicators following energy drink consumption.

Measure	Experimental Group (Pre)	Experimental Group (Post)	Control Group (Pre)	Control Group (Post)
Mean Score (%)	87	91	79	75

Significance determined at p < 0.05.

Discussion:

The study reinforces growing concerns regarding the cardiovascular impact of energy drink consumption, as evidenced by a noticeable rise in both systolic and diastolic blood pressure among participants who consumed energy drinks. This physiological response is consistent with findings from previous research SOMW studies which also reported similar cardiovascular effects following energy drink intake in young individuals (13, 14). Interestingly, despite the elevated blood pressure readings, pulse rate remained relatively stable post-consumption, a result that supports that heart rate may not be immediately affected by short-term energy drink use. (12)

In contrast to the marketed claims of enhanced mental alertness and academic benefit, this study found no statistically significant short-term improvement in academic performance following energy drink consumption. These findings challenge the perceived cognitive-enhancing effects of such beverages (4,14). It is worth noting that factors such as cultural attitudes towards energy drink use, habitual consumption patterns, and individual physiological responses could play a role in modulating both the physical and academic effects observed. These contextual influences may explain the variability in findings across different populations and highlight the need for further region-specific research.

Conclusion:

Energy drink consumption among Pakistani nursing students may elevate cardiovascular indicators such as blood pressure but does not significantly impact

academic performance in the short term. These findings highlight the need for awareness campaigns about the potential health risks of energy drink use.

Author's Contribution:

A.S. contributed to the study design and data analysis, literature review and manuscript writing.

Conflict of Interest:

The author declare no conflict of interest related to this study.

Funding & Ethics:

This research was self-funded by author. The study was conducted in accordance with ethical guidelines and approved by the institution.

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