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Energy Drink Consumption Among Papuan Athletes

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ABSTRACT: This study aimed to determine the description of energy drink consumption in Papuan athletes. Energy drinks are popular, and their consumption is increasing in today's fast-paced and active era, including among active workers and athletes. This study used a cross-sectional survey design involving 146 athletes using an accidental sampling technique. The energy drink consumption was known by a questionnaire consisting of 9 questions. The data to be collected includes sample characteristics (age, gender, sports, and last education), consumption, form, time, the purpose of consumption, perceived effect, amount, and side effects. The results showed that 52.74% of Papuan athletes had never consumed energy drinks, while 47.26% said they had consumed energy drinks. The energy drink consumption habits were 1-4 times in the form of sachets consumed during the day with no specific purpose. The perceived effect was the loss of tiredness with the amount taken one can/sachet/portion without experiencing side effects.

KEYWORDS: consumption, energy drink, athlete, Papua

I. INTRODUCTION

In this fast-paced and active era, energy drink consumption is in vogue. Energy drinks are the most consumed energy supplements compared to drug supplements or tablets (Putriastuti et al., 2007). Energy drink consumption is increasing among the general public and sports individuals. Data shows an increase in 100 mL packaged energy drink consumption occurred between 2014 and 2017 by 62.22%, from 1.59 per capita per year to 2.58 (Ministry of Agriculture, 2017). The 2018 National Health Survey (known in Bahasa Indonesia as *Riskesda*) data occupies the second highest number in Indonesia. The proportion of energy drink habits in Papua province with a frequency of 1 time per day was 5.9% and 1-6 times per week was 13.28% (Ministry of Health, 2019). This increase was triggered by the community's need for additional energy, stamina, and fatigue recovery. In addition, advertising promotions, ease of access, practical packaging, and good taste are also triggered for increasing energy drink consumption (Putriastuti et al., 2007).

However, the consumption of energy drinks is still controversial worldwide (Higgins et al., 2018; Alsunni, 2015), especially in Indonesia. Energy drinks contain amino acids such as taurine, caffeine, sugar and B-complex vitamins. Currently, many questions arise regarding facts or myths related to energy drinks, the most popular of which is "is it safe to consume energy drinks?" "What are the implications and dangers?" On the other hand, awareness of meeting nutritional needs and maintaining public health is increasing. The Indonesian Food and Drug Supervisory Agency (BPOM) issued a distribution permit for energy drinks circulating in Indonesia. Research shows energy drinks harm health, such as cardiac arrhythmias, worsening the work of the liver and kidneys (Gutierrez-Hellin et al., 2021; Lasheras et al., 2021; Woolsey et al., 2010). Excessive energy drink consumption could be life-threatening and lead to several drawbacks, including anxiety, trouble sleeping, and seizures (Higgins et al., 2018). Continuous use can slowly damage the renal blood vessels (Erdmann et al., 2021). The sugar content can cause excess energy and diabetes, and dental caries (Ballard et al., 2010; Nowak et al., 2018).

Consumption has its consumption rules based on the composition of each package. Energy drinks are only recommended for high-activity individuals (Astorino et al., 2012). Knowledge and understanding of energy drinks also vary, especially when there are advertisements (Hardy et al., 2017). Each individual has a different tolerance for the content of energy drinks (Aulawi, 2005). The highest energy drink consumers are teenagers (52-68%), while adults are around 32% (Erdmann et al., 2021). Athletes are at risk of high energy drink consumption due to high sports activities, especially outdoors or under scorching heat compared to society in general (Giriwijoyo, 2012). Energy drinks are popular among workers and athletes to increase stamina, prevent sleepiness and maintain fitness (Pratiwi & Mu'in, 2017). Energy drinks contain ergogenic substances (caffeine, taurine) that

make them more stamina or energy (Tabassum et al., 2021). However, research on female sprint athletes showed no ergogenic effect (Astorino et al., 2012). Other studies have found side effects that interfere with psychological performance in athletes, namely nervousness and insomnia (Salinero et al., 2014). Furthermore, there was no mental or physical improvement in performance among e-sport athletes (Thomas et al., 2019), tough Simulescu et al. (2019) found the opposite effects. Sports drink beneficial for the physical performance of endurance in adult athletes. Energy drinks containing caffeine and taurine showed no impact on sprint athletes' performance (Jeffries et al., 2020).

Although the proportion of energy drink consumption habits in Papua is known, the proportion and description of its consumption among Papuan athletes have yet to be discovered. In contrast, information about Papuan athletes' energy drink consumption is essential. Furthermore, paying attention to the impact caused by excessive consumption of energy drinks is important to do this research.

II. METHODS

This cross-sectional study used a questionnaire with 146 sample athletes. Accidental sampling was used in this study in Jayapura Papua between July and December 2022. The questionnaire was adopted from Singh (2010), consisting of 9 items questions regarding the consumption of energy drinks. We collected data including sample characteristics (age, gender, and sports), frequency of consumption, the amount of consumption, the reason for consumption, the situation of consumption, the time of the consumption and the way of serving. The SPSS program version 28 was used to process data using univariate analysis to describe the consumption of energy drinks. For example, the total of athletes who consume energy drinks, frequency of consumption, amount of consumption, the reason for consumption, consumption situation, time of consumption and method of serving.

III. RESULTS

According to the data analysis, the study results are presented as follows.

A. Subject Characteristics

Table 1. Subject Characteristics

Characteristics	Means ± SD	Total	Percentage (%)
Age	16.15±3.31		
Gender			
Male		99	67,81
Female		46	31,51
Characteristics		**Total**	**Percentage (%)**
Sports			
Athletics		21	14,38
Basketball		4	2,74
Hockey		7	4,79
Taekwondo		5	3,42
Martial Arts		7	4,79
Wrestling		5	3,42
Volley Indoor		6	4,11
Football		28	19,18
Karate		5	3,42
Judo		3	2,05
Tennis Court		3	2,05
Outdoor Volley		1	0,68
Anchovy		3	2,05
Rowing		9	6,16
Weightlifting		5	3,42
Boxing		6	4,11
Cycling		5	3,42

Outdoor Hockey	1	0,68
Swimming	1	0,68
Rugby	21	14,38
Education		
Elementary	16	10,96
Junior High School	52	35,62
Senior High School	77	52,74
Bachelor's degree	1	0,68
Total	146	100

The above table shows the average age of the respondents involved in this study is 16.15 years, with a standard deviation of 3.31. Data based on gender, the respondents involved were dominated by male athletes (67.81%) who play football (19.18%). Based on educational background, most of the samples were at senior high school (52.74%).

B. Energy Drink Consumption

The descriptive analysis is consecutively presented as follows.

1. Energy drink consumption

Table 2. Energy drinks consumption

Consumption	Total	Percentage (%)
Yes	69	47,26
No	77	52,74
Total	146	100

The above table shows that 52.74% of respondents have never consumed energy drinks, while 47.26% stated that they had consumed energy drinks. Thus, more samples have never consumed energy drinks than those consumed.

2. Frequency of consumption

Table 3. Frequency of consumption of energy drinks

Frequency	Total	Percentage (%)
1-4 time(s)	56	81,16
5-10 times	8	11,59
>11	5	7,25
Total	69	100

Based on the above table, the respondents who have consumed energy drinks are mostly consuming energy drinks at a frequency of 1-4 times (81.16%). Around 7.25% consumed energy drinks more than 11 times during the week.

3. Drink shape

Table 4. The shape of the energy drink

Shape	Total	Percentage (%)
Sachet	47	66,67
Can	11	15,94
Bottles	12	17,39
Total	69	100

Table 4 shows that approximately 66.67% of respondents consume energy drinks in sachets, followed by cans and bottles; respectively, 17.39% and 15.94% of the total respondents.

4. Time of consumption

Table 5. Consumption time energy drink

Time	Total	Percentage (%)
Noon (before lunch)	34	49,28

Afternoon (after lunch before dinner)	21	30,43
Night (after dinner)	13	18,84
Noon (before lunch) and afternoon (after lunch before dinner)	1	0,01
Total	69	100

Table 5 informs that about half of the respondents (49.28%) consume energy drinks during the day or before lunch. One person (0.01%) is reported to consume energy drinks before lunch and in the afternoon.

5. Purpose of consumption

Table 6. Consumption purpose

Purposes	Total	Percentage (%)
To feel fresh and refreshed	1	1,45
To be able to stay up late (not easily sleepy)	2	2,90
Overcoming body fatigue due to lack of sleep	9	13,04
Fad (no specific purpose)	31	44,93
To get excellent stamina during exercise	20	28,99
To restore stamina	3	4,35
Stay fresh and fit all day / don't get tired easily	2	2,90
To refresh the body in hot weather	1	1,45
Total	69	100

Table 6 informs that the most frequent reasons given by respondents to consume energy drinks are for fun or not having particular goals (44.93%) and maintaining stamina during exercise (28.99%).

6. Consumption effect

Table 7. Effect of energy drink

Effects	Total	Percentage (%)
Enjoy the freshness	1	1,45
Fresh with stamina	1	1,45
Feel fresher	2	2,90
Increased body energy	22	31,88
Feel more awake	14	20,29
Increased concentration	3	4,35
Eliminate fatigue	20	28,99
Don't feel any difference before and after drinking	6	8,70
Total	69	100

Table 7 informs that the dominant effects felt by respondents after consuming energy drinks were increased body energy (31.88%), eliminating fatigue (28.99%), and feeling more awake (20.29%).

7. Amount of consumption to feel the effect.

Table 8. Amount to feel energy drinks effects.

Amount to feel the effect	Total	Percentage (%)
1 can/sachet/portion	49	71,01
2-3 can/sachet/portion	11	15,94
> 3 can/sachet/portion	9	13,04
Total	69	100

The table above shows the effect of energy drinks felt by respondents after consuming one can/sachet/portion (71.01%) and around 13.04% consuming more than three cans/sachet/portion to get the effect.

8. Side Effects

Table 9. Effects felt after consuming energy drinks.

Side Effects	Total	Percentage (%)
Frequent urination	18	26,09
Heartbeats	3	4,35
headache	1	1,45
Did not feel any of the above side effects	46	66,67
Drowsy	1	1,45
Total	69	100

The data shows that 66.67% of respondents do not feel the side effects of energy drinks. Meanwhile, frequent urination (26.09%) and heart palpitations (4.35%) are the dominant side effects.

IV. DISCUSSION

This study aims to provide an overview of Papuan athletes' consumption of energy drinks. This study found that 52.74% of Papuan athletes had never consumed energy drinks, while 47.26% stated they had consumed energy drinks. The dominant pattern of energy drink consumption is 1-4 times in the form of sachets consumed during the day. The most consumed reason was no specific purpose, where the perceived effect is the loss of tiredness with the amount taken one can/sachet/portion without experiencing side effects. Sequentially the findings will be discussed below.

The results showed that most athletes (52.74%) never consumed energy drinks, while 47.26% said they had consumed energy drinks. The dominant pattern of energy drink consumption is 1-4 times in the form of sachets consumed during the day. Consuming activity is the behavior or act of drinking energy drinks. Energy drinks included in supplements should be consumed in moderation because the aim is only to complete the insufficient nutritional needs. The function of a supplement is as an additional substance to improve and increase the body's resistance (Ambika, 2010). Data from *Riskedas* Papua shows that the proportion of energy drinks consumption in Papua is the second highest in Indonesia. The difference in results is probably due to the distribution of the data collection population: the general public or non-athletes. According to Woolsey et al. (2010), athletes are considered a high-risk group with adverse effects due to energy drink consumption combined with alcohol. The frequency of consumption is in line with the findings of *Riskesdas*, which is more than one time with a frequency of 1-6 times (Ministry of Health, 2019).

Although the percentage of consumption is below 50% among Papuan athletes, 47.26% consume energy drinks. This amount is almost half of the samples. Research shows energy drinks are detrimental to health, such as diabetes, liver and kidneys damage, cardiac arrhythmias and dental caries (Erdmann et al., 2021; Gutierrez-Hellin et al., 2021; Lasheras et al., 2021; Woolsey et al., 2010; Ballard et al., 2010). Findings show that the most consumed brand in Indonesia contained ginseng extract, taurine, caffeine, royal jelly and vitamins. Harsh energy drinks may contain various ingredients. The most common ingredients are caffeine, amino acids, carbohydrates, herbs, and vitamins (Mora-Rodriguez & Pallares, 2014). Caffeine is the most common substance expected to provide ergogenic effects (Jimenez et al., 2021). Thus, the consumption might cause excess caffeine consumption (Rosenbloom, 2014; Sanctis et al., 2017). Easy access at the kiosk or grocery store and the marketing of this trademark advertisement on electronic and social media affect the products sale among vulnerable groups, including adolescents and young adults (Kraak et al., 2020; Harris & Munsell, 2015; Rambe & Jafeta, 2017).

This study also found that most athletes consume energy drinks without any specific purpose. The perceived effect is the loss of fatigue with the amount taken one can/ sachet/ portion without experiencing side effects. The motivation for consuming energy drinks is different for each individual. A study among US high-school athletes found that the highest percentage of reasons to consume energy drinks is to rehydrate and gain energy (Fields et al., 2015). Adolescents could recognise energy drinks, but they are reported to need more knowledge regarding the containing substances (Costa et al., 2014; Hardy et al., 2017). The samples of this study are dominantly adolescents in their 16s. In line with a study in Jeddah, adolescents' and young adults' energy drink consumption is at least one can per week (Alrasheedi, 2016). In line with Astorini et al. (2012), energy drink consumption has no side effects. Studies have found side effects of energy drink consumption among 11-18 years individuals, such as insomnia, headaches, stomach aches and hyperactivity (Visram et al., 2016). However, energy drinks could not increase neuromuscular performance.

Meanwhile, several studies found muscle strength and power (Mora-Rodriguez, 2014). Cardiac arrest, seizures and dental enamel erosion are also reported as energy drink consumption adverse effects among young athletes (Duchan et al., 2015).

Thus, it is essential to conduct dissemination regarding energy drink consumption and the consequences due to excessive amount of consumption among athletes (Buxton & Hagan, 2012).

V. CONCLUSIONS

This study concluded that 52.74% of Papuan athletes had never consumed energy drinks, while 47.26% stated that they had consumed energy drinks. The dominant pattern of energy drink consumption is 1-4 times in the form of sachets consumed during the day. They consume energy drinks with no specific purpose, where the perceived effect is the loss of tiredness with the amount taken in one can/sachet /portion and without feeling the side effects.

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