ORIGINAL ARTICLE

Association between irregular eating habits and irritable foods with dyspepsia syndrome in students

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ABSTRACT

Introduction: A group of conditions affecting the upper gastrointestinal tract, known as dyspepsia syndrome, includes epigastric pain, discomfort, bloating, frequent belching, nausea, and vomiting. According to the World Health Organization (WHO) data in 2015, dyspepsia was found to affect 13-40% of the population annually and is listed as one of the top 10 non-communicable diseases in Indonesia that can increase morbidity.

Materials and Methods: This study aimed to investigate the relationship between dietary habits and the prevalence of dyspepsia syndrome among preclinical medical students at the Christian University of Indonesia in the 2023 class. The methodology employed was a descriptive-analytical study, utilizing a cross-sectional approach and a sequential sampling strategy, with 108 participants. This study employed univariate and bivariate analysis as its analytical methods.

Results: The findings of the univariate study revealed that most participants were 18 years old, and 76 women (70.4%) of the total respondents reported experiencing dyspepsia syndrome, accounting for 61.1% of the sample. In this study, bivariate analysis using the Chi-square test revealed a strong correlation (p-value < 0.001) between the incidence of dyspepsia syndrome and diet.

Conclusion: This study concluded that there is a relationship between diet and the development of dyspepsia syndrome.

KEYWORDS:
Dyspepsia syndrome; irregular eating habits; irritable foods; students

INTRODUCTION

Dyspepsia syndrome is a collection of symptoms that indicate a disorder of the upper digestive tract. Symptoms of dyspepsia syndrome consist of pain in the epigastric area (upper middle part of the stomach) or solar plexus, discomfort or a burning sensation spreading in the chest, flatulence, feeling full quickly, frequent belching, nausea, and vomiting. The causes of dyspepsia syndrome are classified into two groups, namely organic dyspepsia and functional dyspepsia. Organic dyspepsia has underlying pathophysiological causes, such as peptic ulcers, cancer, or chronic drug consumption, that cause structural abnormalities in the stomach. In contrast, functional dyspepsia is not based on disease, and no structural abnormalities are found in the stomach.[1]

Based on data from the World Health Organization (WHO) in 2015, it is known that 13-40% of the total population experiences dyspepsia every year.[2] Dyspepsia has a prevalence that varies between 11-29.2% in several countries, such as the United States with a figure of 23- 25.8%, India at 30.4%, New Zealand at 34.2%, Hong Kong at 18.4%, and China at 23.3%[3,4] Based on 2010 Indonesian Health Profile data published by the Indonesian Ministry of Health in 2011, dyspepsia is included in the top 10 diseases of inpatient hospital patients in Indonesia and is in 5th place with the number of patients 24,716 while outpatients are in 6th place with the number of patients 88,599.[2] In Indonesia, especially big cities, have a high incidence of dyspepsia based on information from the Indonesian Ministry of Health 2015 with the incidence of dyspepsia in Surabaya reaching 31.2%, Denpasar 46%, Jakarta 50%, Bandung 32.5%, Palembang 35.5%, Pontianak 31.2%, Medan 9.6%, and Aceh reached 31.7%.[5] According to the Indonesian Health Profile 2020 explains that dyspepsia is still in the top 10 non-communicable diseases that can increase morbidity.[6]

Dyspepsia can be caused by unhealthy eating patterns and lifestyles which include irregular eating schedules, the habit of consuming spicy and sour foods, alcohol, and coffee. These factors can also increase the risk of gastric ulcers due to increased levels of stomach acid.[7] Dyspepsia can also be caused by disorders of gastric motility and anatomy, allergic reactions (hypersensitivity), psychosis, and Helicobacter pylori infection.[8] Research on the relationship between dyspepsia syndrome and pattern eating carried out by Tiana A, et al. (2017) found a correlation of 79.2% between dyspepsia syndrome and irregular eating habits.[9] Nuraini R, et al. (2023) stated that there was a correlation between eating habits and dyspepsia events in preclinical students at the Faculty of Medicine. They found that as many as 89.7% of students with irregular eating habits experienced dyspepsia. Other supporting research was conducted by Suriadi GM, et al. (2024), namely that there is a correlation between irregular eating patterns and the incidence of dyspepsia of 65.7%.[10]

The most significant behaviour that can influence nutritional status is diet. This is because the quantity and quality of food and drinks consumed can influence nutritional intake, which

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in turn can affect the health of individuals and society. If the diet is not changed to include a balanced nutritional intake, this can affect the body's condition and make it more susceptible to non-communicable diseases and other chronic diseases.[11] Three main factors shape the diet: the type, frequency, and amount of food consumed. Irregular eating schedules can interfere with normal stomach function. Gastric emptying can occur due to irregular food consumption, such as skipping meals so that it can reduce the amount of food that enters the stomach. Friction between the stomach walls can cause stomach erosion. Acid reflux is triggered by increased production of stomach acid (HCl) in this condition.[12]

Diet has a significant role in causing dyspepsia syndrome based on studies conducted by Pilichiewicz, et al. (2009) found that 15% of patients experienced dyspepsia due to irregular eating patterns[13] This statement is supported by research by Hassanzadeh S, et al. (2016) explained that having a habit of frequently consuming main foods and additional foods or snacks can influence the incidence of dyspepsia. Skipping meals can cause several problems, including antral hypomotility, delayed gastric emptying, poor gastric accommodation, changes in the gastrin hormone, and acid secretion in the stomach[14] The risk of developing dyspepsia syndrome can increase due to a person's habit of consuming certain foods and drinks that are irritants. such as spicy or sour foods, coffee, alcohol, and carbonated drinks.[2]

Adolescents are included in the group that is vulnerable to dyspepsia syndrome.[2] Adolescence, which is defined as the age range from 12 to 20 years, is a developmental transition from childhood to adulthood, according to Papilia and Olds in Jahja Y (2011).[15] Medical Faculty students have The schedule and activities that must be carried out are very tight, including various activities such as lectures, group discussions, and involvement in non-academic activities, especially for first-year students during the pre-clinical period because they need to adapt to the routine at the Faculty of Medicine. Their busy schedules and activities often interfere with their eating and the types of food they consume daily, resulting in a high risk of dyspepsia in medical students.[2]

Research conducted by Jaber at Gulf Medical University, United Arab Emirates (2016) found that 43.8% of pre-clinical medical students experienced dyspepsia.[16] Another study conducted by Dewi A (2017) showed that among students from the 2015 and 2016 classes of the Hasanuddin University Faculty of Medicine, it was found as many as 97.2% of respondents who consumed food and drinks that could irritate the stomach experienced dyspepsia syndrome.[12] Research conducted by Irfan in 2019 also revealed that 73.3% of pre-clinical students at the Faculty of Medicine at UIN Syarif Hidayatullah Jakarta experienced dyspepsia syndrome which was caused by irregular eating patterns and consumption of food and drinks that could irritate the stomach.[17]

The high incidence of dyspepsia syndrome among medical students makes researchers feel the need to conduct a study that discusses the relationship between diet and the incidence of dyspepsia syndrome in pre-clinical students class of 2023 at the Faculty of Medicine, Universitas Kristen Indonesia.

MATERIALS AND METHODS

Study design and setting

The methodology used is quantitative research with a cross-sectional study approach and descriptive analysis design. This research aims to understand the correlation between diet and the prevalence of dyspepsia syndrome in pre-clinical studentsclass of 2023 at the Faculty of Medicine, Indonesian Christian University. Data was obtained and analyzed using a research instrument in the form of a questionnaire.

Sample size and sampling technique

Subjects who met the inclusion and exclusion criteria were taken from the population at the Faculty of Medicine, Universitas Kristen Indonesia as research samples. Sequential sampling determines the sample by including all participants who come in a row and meet the research selection criteria until the required number of subjects is met. This is the sampling technique used in this research13.

Research Criteria

Inclusion Criteria: Students from the Faculty of Medicine class of 2023, Universitas Kristen Indonesia who are active and willing to be respondents.

Exclusion Criteria: Students from the Faculty of Medicine, Universitas Kristen Indonesia who are on leave and are not willing to be respondents.

Research Variables

Independent Variable

Free factors are known as independent variables that have an impact on the dependent variable. The independent variable in this study is eating patterns (eating regularly and irritable eating foods and drinks).

Dependent variable

The dependent variable that is influenced or is the result of the independent variable is called the dependent variable. The dependent variable in this study is dyspepsia syndrome.

Data Collection Methods

How to Collect Data

This research uses primary data, namely data obtained directly from research participants through observation and the use of questionnaires.

Data Collection Instruments

This research instrument consisted of 3 questionnaires which were used based on previous research references, namely a dietary pattern questionnaire that asked about eating regularity, irritating foods, and drinks, and a dyspepsia questionnaire based on Rome III criteria. The three questionnaires used in previous research were valid and reliable, then validity and reliability tests were carried out again.

1. Dietary regularity questionnaire
   The questionnaire about eating pattern regularity which consists of meal frequency, meal intervals, and additional foods has 11 questions. Ten questions (numbered 1 to 10) are positive questions and one negative (numbered 11) is a negative question. A Likert scale with options (a), (b), (c), or (d) is used in this questionnaire. Each question with the lowest score is 0 and the maximum score is 3. An overall score of 0 to 16 is irregular eating habits and a score of 17 to 33 is regular eating habits.
2. Irritant food and drink questionnaire
   There are eight negative items on this questionnaire. Likert scale with options (a), (b), (c), or (d). Each question with the lowest score is 0 and the maximum score is 3. An overall score of 0 to 11 assumes that the type of food and drink is not irritating and a score of 12 to 24 is not irritating.
3. Dyspepsia syndrome questionnaire
   The dyspepsia syndrome questionnaire uses 7 questions based on the Rome III Criteria with answer options of "no" or "yes". This questionnaire uses the Guttman scale. Dyspepsia syndrome is positive (+) if the respondent answers "yes" to 1 or more of questions number 1-4 or 2 or more of all questions. Dyspepsia syndrome is negative (-) if the respondent answers "no" to the total question.

Data Analysis Methods

SPSS (Statistical Product and Service Solution) statistical software package and data analysis will be carried out, namely univariate analysis and bivariate analysis.

1. Univariate analysis
   Each variable describes and summarizes the data in table or graph form using univariate analysis. The characteristics of the respondents were known and every variable related to pre-clinical students class of 2023 at the Faculty of Medicine, Universitas Kristen Indonesia was examined in this research.
2. Bivariate analysis
   The relationship between each independent variable and the dependent variable was examined using the chi-square statistical test with a significance level of p-value <0.05 in SPSS software as part of the bivariate analysis to ensure interaction between the two variables.

RESULTS

Descriptive research on research variables using frequency distribution and percentages and univariate analysis was carried out. The following are details of the univariate analysis of this study, which includes: the subject age and gender; the subject's eating habits, including how often the subject eats and what foods and drinks cause irritation; and the incidence of dyspepsia in 108 students' class of 2023 at the Faculty of Medicine, Universitas Kristen Indonesia.

Subject Characteristics Based on Age and Gender

Frequency distribution of respondents based on the age and gender of students at the Faculty of Medicine, Universitas Kristen Indonesia, classified as data in Table I.

Table I above describes the characteristics of respondents based on age among students class of 2023 Faculty of Medicine, Universitas Kristen Indonesia. Of the 108 respondents, there were 2 people aged 17 years (1.9%), 56 people aged 18 years (51.9%), 39 people aged 19 years (36.1%) and 11 people aged 20 years (10.2%). It was found that 18-year-olds had the largest proportion of FK UKI students class of 2023, namely 56 people with a percentage of 51.9%.

This research is in line with research from Putri RN, et al. (2015) regarding the incidence of dyspepsia in students at the Faculty of Medicine, the largest number of respondents at the age of 18 was 94 people (68.1%) based on the age range of 16-19 years.[18] Variations in age frequency in several studies can be caused by differences in age and number of respondents. in several studies. The characteristics of respondents based on gender are 32 people who are male (29.6%) and 76 people who are female (70.4%), so it is known that the female gender dominates this research. It was found that the female gender had the largest proportion among FK UKI students class of 2023, namely 76 people with a percentage of 70.4%.

Research conducted by Tiana A., et al. (2017) explained that the majority of Medical Faculty student respondents who experienced dyspepsia were women with a percentage of 75%.[9] Syah MSF, et al. (2022) have research results in the same direction, namely that the majority of respondents who experienced dyspepsia syndrome were female.[4]

Women are at risk of experiencing dyspepsia compared to men because they try to maintain an ideal body weight and tend to have the wrong body image, such as being afraid of being too thin or fat. Women also have higher levels of the hormones estrogen and progesterone than men. The hormone estrogen has a role in modulating pain responders in the pain recognition pathway when interacting with neurotransmitters. When estrogen hormone levels fluctuate during menstruation, it causes mood swings and impacts visceral pain and gastric motility, so women tend to experience dyspepsia syndrome.[4]

Eating patterns of students class of 2023 at the Faculty of Medicine, Universitas Kristen Indonesia

a. Eating Regularity

The questionnaire to determine the respondent's eating regularity consisted of 11 questions which were categorized into two, namely regular and irregular. The results of the distribution of respondents are explained in the following table:

Table II explain the results of analysis regarding eating patterns based on eating regularity are obtained. Data has been collected and researched on 108 respondents, 39 people have a regular eating pattern (36.10%), and 69 people have an irregular eating pattern (63.90%). These results state that what dominates is irregular eating patterns among students class of 2023 at the Faculty of Medicine, Universitas Kristen Indonesia.

Research conducted by Dewi A (2017) is in line with the results of research on students at the Faculty of Medicine, Hasanuddin University, which found that 315 respondents

Table I: Frequency Distribution of Respondents Based on Age and Gender

Characteristic based on	Frequency (n)	Percentage (%)
Age		
17 years	2	1.9
18 years	56	51.9
19 years	39	36.1
20 years	11	10.2
Gender		
Male	32	29.6
Female	76	70.4

Table II: Distribution of Respondents Based on Eating Regularity

Meal Regularity	N	Percentage (%)
Regular	39	36.10%
Irregular	69	63.90%

Table III: Distribution of Respondents Based on Eating Irritable Foods

Irritant foods and drinks	N	Percentage (%)
Not irritating	58	53.7%
Iritative	50	46.3%

Table IV: Frequency Distribution of Respondents Based on the Occurrence of Dyspepsia Syndrome

Dyspepsia Syndrome	N	Percentage (%)
Negative	42	38.9%
Positive	66	61.1%

Table V: Cross Tabulation and Chi-Square Test Between Eating Patterns Based on Eating Regularity and the Incidence of Dyspepsia Syndrome, and Between Irritant Foods and Drinks and the Incidence of Dyspepsia Syndrome

Description	Dyspepsia Syndrome				Total		p-value
	Negative		Positive				
	N	(%)	N	(%)	Number	(%)	
Eating Regularity							
Regular	34	87.2%	5	12.8%	39	100%	<0.001
Irregular	8	11.6%	61	88.4%	69	100%	
Irritant foods and drinks							
Not Irritating	40	69.0%	18	31.0%	58	100%	<0,001
Irritative	2	4.0%	48	96.0%	50	100%	

(51.5%) had irregular eating patterns. Other supporting research results were conducted by Thoriq M, et al. (2023) on students at the Faculty of Medicine, Islamic University of North Sumatra, which showed that 33 respondents experienced irregular eating patterns (55%).[6] Irregular eating patterns could potentially cause dyspepsia syndrome due to students having busy and a lot of activities on campus. A regular eating pattern has a significant impact on gastric acid secretion because this eating pattern can facilitate the stomach's ability to detect food intake patterns and regulate gastric acid production. Irregular eating habits will make it difficult to control stomach acid properly. This condition for a long period cause excessive stomach acid production, thereby increasing the risk of stomach ulcers.[19]

Irritant Foods and Drinks

The questionnaire consisted of 8 questions to find out whether respondents consumed irritating foods and drinks. The results of the distribution of respondents are described in the following table.

Table III explain the results of analysis regarding eating patterns based on foods and drinks irritating were obtained. From the data that was collected and researched on 108 respondents, 58 people did not consume irritating foods and drinks (53.7%), and 50 people consumed irritating foods and drinks (46.3%). The results of this research show that of the 108 students class of 2023 at the Faculty of Medicine, Universitas Kristen Indonesia. FK UKI 2023, the largest distribution was not to consume food and drinks that could irritate.

The results of research on students at the Hasanuddin University Faculty of Medicine by Dewi A (2017) are in line with this research that the majority of respondents did not consume irritating foods and drinks, amounting to 358 respondents (58.5%).[7] Based on Research conducted by Nuraini R, et al. (2023) among students at the Faculty of Medicine, Wahid Hasyim University, also agreed with the results of this study, namely that 109 respondents did not consume irritating foods and drinks (85%).

The incidence of dyspepsia syndrome in students class of 2023 at the Faculty of Medicine, Universitas Kristen Indonesia

This questionnaire was conducted to see whether respondents experienced dyspepsia syndrome by categorizing it into two, namely negative and positive. The results of the frequency test of respondents are follows:

The results on Table 5 explain the analysis were obtained based on the incidence of dyspepsia syndrome which consisted of questions regarding dyspepsia syndrome. Data was collected and examined on 108 respondents, 42 people did not show dyspepsia syndrome or were negative (38.9%), and 66 people had dyspepsia syndrome or were positive (61.1%). These results state that those who dominate are positive or experiencing dyspepsia syndrome among students class of 2023 at the Faculty of Medicine, Universitas Kristen Indonesia.

The results described above are in line with research conducted by Prasetyo AV, et al. (2023) examined students at the Faculty of Medicine, Udayana University, it was found that 202 respondents experienced dyspepsia (75.4%).[17] Another study that explained the distribution of respondents who experienced the highest incidence of dyspepsia was conducted by Irfan (2019) on students at the Faculty of Medicine, UIN Syarif Hidayatullah Jakarta, namely totaling 66 respondents (73.3%).[20] Dyspepsia syndrome can be caused by dietary and environmental factors, psychology, gastric acid secretion, gastrointestinal dysmotility, autonomic dysfunction, and Helicobacter pylori infection.[21] Dietary factors that are at risk of causing dyspepsia include the regularity, frequency, and intervals of eating, breakfast habits, food consumption habits (spicy and sour), and risky drinks (coffee, soda, etc. alcohol).[22] Busy schedules or busy activities on campus can cause students to often neglect their eating habits, thereby increasing the risk of dyspepsia syndrome

Bivariate Analysis

Bivariate analysis was used to determine whether there was a relationship or influence between diet on the incidence of dyspepsia syndrome in students class of 2023 at the Faculty of Medicine, Universitas Kristen Indonesia. The results of the bivariate analysis of the relationship between diet patterns based on the regularity of eating patterns and irritating foods and drinks with the incidence of dyspepsia syndrome and also between Irritant Foods and Drinks and the incidence of dyspepsia syndrome are described below:

DISCUSSION

Based on the cross-tabulation results in Table V, it is known that of the 39 respondents, there were 34 people had a regular eating pattern, did not experience dyspepsia syndrome (87.2%). There were 5 people had a regular eating pattern and experienced dyspepsia syndrome (12.8 %). There were 69 respondents with irregular eating patterns, 8 respondents did not experience dyspepsia syndrome (11.6%) and 61 other respondents experienced dyspepsia syndrome (88.4%). The results of statistical analysis using the Chi-square correlation test showed that there was a significant relationship between eating patterns based on eating regularity and irritating foods and drinks and the incidence of dyspepsia syndrome in pre-clinical students class of 2023 at the Faculty of Medicine, Universitas Kristen Indonesia with a p-value <0.001.

This research is in line with that carried out by Thoriq MA, et al. (2023) on students at the Faculty of Medicine, Islamic University of North Sumatra, showed that there was a relationship between the regularity of eating patterns and the incidence of dyspepsia using the Chi-square correlation test with a p-value <0.0016. This research is also in line with research by Prasetyo AV, et al. (2023) on students at the Faculty of Medicine, Udayana University, showed that there was a relationship between eating regularity and the incidence of dyspepsia syndrome, Chi-square correlation test with p-value <0.022.[17]

Meal schedules, meal frequency, and types of food consumed are components that play a role in regular eating patterns. Irregular food consumption, such as skipping meals, will cause a reduction in the amount of food entering the stomach, resulting in gastric emptying, which over a long period will result in erosion of the stomach due to friction between the stomach walls. The increase the production of gastric acid (HCl) which stimulates gastric acid reflux. The impact of irregular eating patterns will cause dyspepsia syndrome such as pain in the epigastric area (upper middle of the stomach) or solar plexus, discomfort or a burning sensation spreading in the chest, flatulence, feeling full quickly, frequent belching, nausea and vomiting.

Based on the cross-tabulation results in Table V, it is known that of the 58 respondents who did not consume irritating foods and drinks, it was found that 40 people did not experience dyspepsia syndrome (69.0%) and 18 people experienced dyspepsia syndrome (31.0%). There were 50 respondents known to consume irritating foods and drinks, which two respondents did not experience dyspepsia syndrome (4.0%) and 48 respondents experienced dyspepsia syndrome (96.0%). The results of statistical analysis using the Chi-square correlation test showed that there was a significant relationship between eating patterns based on irritating foods and drinks and the incidence of dyspepsia syndrome in pre-clinical students class of 2023 at the Faculty of Medicine, Universitas Kristen Indonesia with a p-value of <0.001.

This research is in line with research conducted by Prasetyo AV, et al. (2023) on students from the Faculty of Medicine, Udayana University, which showed that there was a

relationship between consuming irritating foods and drinks and the incidence of dyspepsia syndrome, Chi-square correlation test with p-value <0.026.[17] Another study conducted by Dewi A (2017) on students from the Faculty of Medicine, Hasanuddin University also stated that that there is a significant relationship between consumption of irritating foods and drinks and the incidence of dyspepsia syndrome in the Chi-square test with a p-value of 0.000.[17]

Dyspepsia syndrome can be caused by consuming irritating foods and drinks, one of which is coffee because it contains caffeine which has the potential to increase stomach acid secretion. Low prostaglandin secretion which protects the stomach and promotes smooth muscle contraction is caused by high gastric acid production. This disrupts gastro-duodenal motility and increases sensitivity thereby causing symptoms of epigastric pain. Increased stomach acid also causes an increase in systemic or local cholecystokinin levels which influence symptoms of early satiety and accelerate the initiation of cholinergic signals from the vagus nerve, causing nausea or vomiting.[23] Foods or drinks that contain gas and are acidic with a low pH of around 3-4 can trigger production. excess gas and accelerates the increase in stomach acid which causes irritation of the stomach and causes symptoms such as flatulence.[2]

Another irritating drink that is at risk of causing dyspepsia syndrome is fizzy drinks. Fizzy drinks contain a lot of gas so when consumed, the gas that is formed is then trapped in the digestive tract which will cause dyspepsia syndromes such as flatulence, frequent belching and nausea.[23] Consuming alcohol can also cause aggressive factors that affect the gastric mucosa, namely reducing defensive factors. Alcohol can also relax the lower esophageal sphincter (LES) resulting in reflux or the return of stomach acid and gas into the esophagus.[24]

Eating fatty foods can worsen dyspepsia due to a condition characterized by delayed gastric emptying and reactivity to gastrointestinal hormones such as cholecystokinin.[25] Spicy foods such as chilies contain the substance capsaicin which changes the way gastrointestinal hormones are secreted and causes the stomach to produce more acid, thereby increasing gastrin synthesis. Lesions and inflammation of the gastric mucosa caused by high levels of stomach acid result in dyspepsia syndrome.[26]

Dyspepsia syndrome can be prevented by administering aloe vera extract because it contains Lemon Juice Concentrate which plays a role in increasing the defense of the gastric mucosa and Chamomile Herb Extract which has anti-inflammatory properties to reduce inflammation in the stomach. Papaya fruit contains proteolytic enzymes that help regenerate damaged stomach cells and reduce or prevent dyspepsia syndrome. The papain enzyme can help in the treatment of dyspepsia syndrome because it contains 11.6% potassium benzylglucosinolate[27] Research conducted by Wang A, et al. (2020) also found that consuming yoghurt made from probiotics containing lactobacillus gasseri showed the effect of reducing dyspepsia symptoms[23] Research by Elliya R, et al. (2022) found that the turmeric plant can be used in traditional medicine because it contains curcumin which can coat the stomach walls due to wounds and functions in reducing stomach acid levels so that it can reduce dyspepsia syndrome.

CONCLUSION

From the processing and analysis of research data, it can be concluded that there is a relationship between eating patterns based on eating regularity and irritating foods and drinks and the incidence of dyspepsia syndrome in pre-clinical students class of 2023 at the Faculty of Medicine, Universitas Kristen Indonesia with a p-value <0.001.

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CONFLICT OF INTEREST

None.

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