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Effect of cognitive behavioral interventions (Yoga) on premenstrual syndrome among adolescents

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Abstract
Background: Adolescence is the period where the childhood changes into grownup stage where the children will experience the new world around them irrespective of sex. That too for Girls being in Adolescent period hormonally, their body undergoes more physiological changes and psychological changes. This is the period where they try to recreate themselves and have a constant goal towards the life by concentrating on studies. But, during this period if they phase premenstrual syndrome, functionally, mentally will be suffering. Their concentration towards academics, social activity, productivity will be affected due to illness like pain, stress and all. Hence as a researcher, I have decided to study about PMS, its significance and how to overcome the PMS through Cognitive Behavioral Interventions (Yoga among school students.
Objective: To assess the effect of Cognitive Behavioral Interventions on Premenstrual Syndrome.
Materials and Methods: This used to be a potential study conducted among adolescent school students in St. Lourdes Girls High school at Chennai from August 2019 to October 2019. Participants were asked to prospectively entry Self-reported Demographic History, personal history, Menstrual history, PMS Signs to be recorded on each day each day calendar/ Diary proposed by ACG criteria and Short Form – 36 Item Health Survey in order to assess their somatic and cognitive problems.
Results: Of the 300 contributors who met the inclusion criteria, 289 crammed out the self-report questionnaire completely, amounting to a response rate of 72.4%. Applying the ACOG guidelines, PMS was once recognized in 289 participants (95%; 71.8% CI, 35.4%; 24.5%). 11 absentees were in Control Group. I50 students in Experimental group were completed the intervention study and therefore the before –and – after form. Two hundred sixty-eight individuals (85.8%) pronounced having at least one of the 10 signs of PMS. The pronounced premenstrual somatic and affective signs and symptoms.The results incontestible that emission pain mitigation when yoga exercise was related with improvement in the SF-36, as well as physical perform (r = 0.529), bodily pain (r = 0.365), general health perception (r = 0.280), vitality/energy (r = 0.351), social event (r = 0.318), and psychological state (r = 0.3555).The yoga exercise intervention was related to the development of the dimensions of physical function (p = zero.0340) and bodily pain (p = zero.0087) of SF-36.
Conclusion: In conclusion, within the present study, School students (adolescents) participated in short term yoga exercise intervention reported fewer physical premenstrual symptoms related to a lower risk of menstrual pain. Cognitive behavioral interventions (Yoga) which can decrease premenstrual Symptoms physically, enhances the mental status psychologically distress therby improve the health of adolescents. Yoga would possibly result in major pain acceptance, the temperament to expertise pain and acknowledge the negative thoughts and emotionsthere by managing depression and distress.

Keywords: premenstrual syndrome, cognitive behavioral interventions, yoga, short form-36 item health survey, American college of obstetrics and gynaecological criteria

1. Introduction

Premenstrual syndrome (PMS) may be a common disorder in all females. Girls with PMS usually report significant symptoms that are both psychological like depression, irritability and physical like headache and back pain [1]. Up to 80% of females expertise a minimum of one premenstrual symptom throughout their cycle [2]. Premenstrual dysphoric disorder (PMDD) may be a severe, typically disabling variant of syndrome (PMS) [3]. Females with PMS report a poorer perceived work-related quality of life in their skilled lives [4] and health-related quality of life [5, 6], and PMS might end in a depressed mood and larger medical specialty comorbidity [7]. Severe menstrual symptoms will considerably impact the standard of lifetime of the affected girls, interfere with academics, social relationships, family, social life [6], and result in enlarged care utilization, attenuated activity productivity, and absence from school [8]. However they are ready to perform commonly at work, home and society.

School children with PMS will have stress during their studies that leads to depression and distress, absent in school, conflict in role performance. They are less concerned in choices that have an effect on themselves at school; and are less happy concerning their academic conditions [4]. All adolescents notwithstanding race, age, or socioeconomic standing, have fully fledged discomfort throughout their menstrual periods. According to our data, one study shows that adolescents have PMS in West Bengal, typically given treatment heat packs or recommended bed rest at a clinic or might provide painkillers. These strategies, that just alleviate adolescents' pain at the time the menstrual cramps occur, but that are not preventive strategies. Hence, additional and more studies try to see preventive strategies that may ameliorate PMS in adolescents throughout their emission periods, and additionally investigate the correlation
between yoga exercise intervention categories at school and at home for indexes of pms, menstrual pain, discomfort

throughout emission periods, overall well-being, and quality of life.

PMS is additionally joined to anxiety and depression [9, 10] and is related to each direct and indirect medical prices because of absence and low performance in school and slow activity at home [11]. The etiology of discharge symptoms is unsure. a large variety of various treatment regimens, as well as manner changes, complementary and medicine (CAM), and drug therapies are promoted for PMS and PMDD [12]. Exercise is usually listed as a remedy for PMS. Intervention studies demonstrate that aerobics will increase hemoprotein, hematocrit, red cell count, and blood platelet count, and reduces the degree of gonadotropic hormone, estradiol, and progesterone; leading to improvement of fatigue, impaired concentration, confusion, and most different discharge symptoms [12, 13]. These findings reveal that exercise effectively reduces the symptoms of PMS and might be used as a treatment. A growing body of proof indicates that yoga advantages physical and psychological state by regulating the hypothalamic-pituitary-adrenal axis and therefore the sympathetic system [14], and yoga has become an progressively well-liked variety of CAM among folks with pain [15, 16]. An irregular controlled trial in India incontestible that Yoga was useful in patients with secretion imbalances [17]. One study suggested that 3 yoga poses reduced the severity and period of dysmenorrhea [18]. Another study rumored that a yoga intervention was related to a reduction in the severity of illness [19]. Yoga may be a mind and body observe with historical origins in ancient Indian philosophy. Several clinicians treating persistent pain by concerning the advantages of yoga from patients UN agency head center of yoga. Yoga categories specifically designed for girls with PMS have increased. But, few intervention-based studies have centered on this issue adolescents.

Empirical research on the alleviation of emission discomfort through yoga-centered health promotion activities remains scarce, and no remarkable study on emission discomfort through interventional psychologic and physical yoga activities among the school students (adolescents). Thus, the aim of this study was to research the impact of a 12-week yoga exercise program on discharge symptoms in school students. We have a tendency to postulated that adolescents collaborating in an exceedingly regular yoga exercise program would have fewer discharge symptoms. The results can contribute to our understanding of the present standing of a menstrual health-friendly atmosphere for school students(adolescent) and might be accustomed establish a model for a healthy manner with an everyday yoga exercise to decrease the negative impact of discharge symptoms.

2. Methods and Materials

2.1 Study setting and Population

This was a yoga exercise intervention study for PMS symptoms conducted from August 2019 to Oct 2019 among school students (adolescents) in St, Lourdes Girls Higher Secondary School at Chennai after getting the a proper approval from Ethical committee. The analysis setting was elected as school. Since the school principal was hearing many complaints regarding PMS and absentism due to PMS, Principal was given permission to conduct the study after obtained permission from the Management. Thus, the school was willing to help in administering this study. School playground was selected for this yoga interventions study of premenstrual symptoms. The school PET teacher also helped a lot through by providing her PET period for our study. We recruited 300 menstruating High school students (8th to 9 th standard Girls) in that school. since the study was evaluative approach, Quasi Experimental design was used for the study. A cluster sampling approach was utilized in enrolling the participants. The goal sample measurement used to be estimated to be 300, on the basis of an 80% strength and 95% CI for the expected incidence of 50%, with 10% loss to follow-up. Eligible standards included

Inclusion criteria were

School Students who were studying 8th and 9th standard, age between 13 to 15 years, who attained menarchy, those who are taking analgesics for menstrual pain was noted, asked them to report to the researcher, students who doesn't have any major illness and gynaecological issues and without any untreated psychiatric disorders., and those who were willing to participate by providing consent form and alos after obtaining consent from parents, and taking no medication throughout the last three months study period. Information about the students were obtained by physical education teacher. By keeping these data, 300 students were selected eligible for the study. This study invited all eligible students to participate within the study. The ethical committee approved the study. Written and signed consent was obtained from every student. 300 students were participated in the study. Among 300 students 150 students had been allotted for Experimental group for to undergo Cognitive Behavioral Interventions (Yoga) and 150 students had been allotted to control group only for observation without undergoing any yoga interventions. Students were asked to maintain the Diary on pms symptoms including physical and psychological symptoms for 3 consecutive months.

2.2. Description of the study and Cognitive Behavioral Interventions (Yoga)

The yoga exercise program was twelve weeks long and featured physically and psychologically interventional yoga activities to see changes in students (adolescents) premenstrual discomfort. In this study, I was as a Researcher selected a Female Yoga Instructor. Since the study was focusing on female adolescent school students and premenstrual symptoms, the female participants who would possibly feel self-conscious throughout the intervention/ exercise program. The Yoga Instructor was a fully-fledged professional person. To encourage prosperous completion of the 12-week intervention program and to facilitate active engagement of the participants during the study, the Yoga Instructor, the Obstetrician & Gynaecologist, and the Researcher determined the best yoga protocol, frequency of the yoga category, and sophistication location at the start of the study

The yoga teacher personally guided every participant's about yoga exercise instruction twice-a-week 50-min sessions in school. There have been two yoga classes every week to settle on from, permitting subjects to pick the convenient time to participate in 2 yoga classes per week. Every 50-min session comprised a 5-min respiratory exercise, a 35-min yoga poses to reduce pms symptoms, and 10-min supine meditation/relaxation techniques to relax the abdominal muscles. In this study, the researcher adopted Pranayama respiratory exercises of yoga, and 5 basic yoga

poses (vajrasana, matyasana, bhujangasana, candra anuloma pranayama, nadisudhi pranayama, bhramari pranayama and 5 instant relaxation techniques) were enclosed in yoga protocol. To make sure the safety and flexibility of the female students, it absolutely agreed upon in the planning stage of the study that solely a simple and basic yoga protocol would be practiced in the class. Initially yoga interventions carried out on the 150 Experimental group students. Control group students 150 kept for assessment without administering any yoga interventions on them. But both the Groups had been instructed to maintain the menstrual diary for 3 consecutive months in order to evaluate the physical, psychological changes.

Yoga exercise observe sessions began with a prayer or invocation to form an atmosphere that relaxes the mind. Yoga is usually performed slowly, in an exceedingly relaxed manner, with awareness of one's body and respiration. To reap the actual uses from yoga practice, one should master in breath management or Pranayama. Respiratory exercises were adopted in my study and therefore the Pranayama technique includes automatic inhalation with short and forceful exhalations. The 5 basic yoga exercise with relaxation techniques practiced in the study included were vajrasana, matyasana, bhujangasana, candra anuloma viloma pranayama, nadisuddhi pranayama, bhramari pranayama and yoga relaxation techniques. These techniques conjointly improves poor posture, relives muscle spasm, stretches the abdominal muscle neck and back, maintains the flexibility of spine and stretches the lower back and hip thereby lowesr back discomfort and helps to relieve stress and reduces the fatigue, gas, bloating. It also improves the poor posture and combats Depression. The session ends with supine meditation/relaxation. Throughout supine meditation, any meditavive posture are often assumed with the eyes closed and therefore the whole body relaxed. The savasana pose (dead body posture), is performed by lying down, approach with the arms and legs well apart and palms facing upward, eyes closed, and therefore the whole body consciously relaxed. These final postures facilitate to relax the complete psycho-physiologic system. an equivalent yoga routine was practiced for twelve weeks.

Before beginning the yoga exercise intervention programme. Researcher administered a structured self-report form to the participants to gather information concerning the demographics, personal lifestyle, menstrual status, menstrual pain scores, PMS symptoms and health-related quality of life throughout the previous three months. At the finish of the 12-week yoga exercise intervention, we administered an evaluation form to assess changes within the participants among the experimental group with the administration of yoga interventions and

control group without administration of yoga interventions to evaluate the PMS symptoms discomfort.

2.3. Description of Assessment Instruments.

2.3.1. Demographics, Personal life style, Behavioral History

Patricipants self-reported demographic history, personal lifestyle, behavior, and menstrual history were assessed. Exercise habit enclosed exercise that was initiated or/and maintained throughout the month before initiating the study, self-reported psychological feeling like, depression, distress, social and academic activities were assessed through evaluation tool throughout the study period.

2.3.2. Menstrual history (Status, Pain Scores), Self-Reported PMS Symptoms and SF 36 Item Health Survey

The students reported menstrual status info concerning age at start, menstrual regularity (cycle regularity), cycle, period of the cycle, menstrual amount (little, moderate, or significant flow), self-reported perception of the impact of menstrual pain (no effect, mlid, moderate, and severe), and menstrual pain score. Analgesic use at intervals the last three months was recorded. The questionnaires enclosed screening queries relating to PMS symptoms at intervals of 3 months and subjects were asked to rate the severity of premenstrual symptoms as "no symptom," "mild," "moderate", or "severe". We divided the participants with discharge symptoms into 2 groups: "moderate to severe premenstrual symptoms" and "no/mild premenstrual symptoms". The Short-Form thirty-six (SF-36) may be a generic live that assesses health ideas representing basic human values relevant to everyone's practical standing and well-being. The SF-36 includes eight aspects of health status: physical functioning, role limitations because of physical health issues, bodily pain, general health, vitality, social event, role limitations because of emotional issues, and psychological state.

2.3.3 Applied Mathematics Analysis

Descriptive statistics, Differential statistics were used to analyse the study finding.

3. Results

A total of 150 experimental group students were completed the intervention study and therefore the before-and-after form. Mean age of the themes was 34.14 ± 1 years. Of the 300 contributors who met the inclusion criteria, 289 crammed out the self-report questionnaire completely, amounting to a response rate of 72.4%. Applying the ACOG guidelines, PMS was once recognized in 289 participants (95%; 71.8% CI, 35.4%; 24.5%). 11 absentees were in Control Group. Characteristics of the participants are proven in Table1. There had been no differences in participants baseline characteristics.

Table 1: Demographic Variables of Students

Characteristics	Experimental & control group (n=289)
BMI (kg/m2)	
Underweight	89 (72.0)
Normal	129 (82.2)
Overweight	39 (36.4)
Obese	33 (31.8)
Education	
Std 08	137 (83.1)
Std 09	152 (85.7)
Exercise	
Practised	103 (81.2)
Not Practised	186 (87.0)
Menstruation	
Menarche (year)	12+/-1
Dysmenorrhea	
Present	268 (92.4)
Absent	21 (24.6)

SD.±Note: Data are presented as numbers (percentage) or mean

Abbreviations: BMI- Body mass index; PMs- Premenstrual

Including age, body mass index, exercise, Menustration and

among the student groups, Dysmenorrhea was the most frequent peculiar menstrual symptom among adolescents. (92.4% in and 62.9% group). Their Two hundred sixty-eight individuals (85.8%) pronounced having at least one of the 10 signs of PMS. The pronounced premenstrual somatic and affective signs and symptoms. Adolescents are in the technique of present process exquisite physical and psychological changes on their way to adulthood. Moreover, they frequently have stress associated to their studies, as well as their sexual and reproductive health. The most popular somatic signs were physical (breast tenderness) (63.6%) , limitation of activity (63.2%). The most popular affective signs and symptoms included irritability outbursts (25.1%), depression (24.1%), and emotional liability (20.3%), which was comparable to before reported findings amongst adolescent. The large majority of subjects (90.6%) stated that they fully fledged menustral pain throughout their menstrual amount (Table 2). The comparison of characteristics of flow, exercise habit, sleep status, and SF-36 scores before the yoga exercise intervention and when three months discovered that subjects attenuated their use of analgesics throughout flow (after: twenty one.9% vs. before: 35.9%, p = 0.0290) and therefore the prevalence of a moderate or severe impact of menstrual pain on academic activity was lower (after: 29.7% vs. before: 53.1%, p = 0.0011) when the yoga exercise interventions were performed. Regular exercise was performed by solely 45.3%, however when intervention, 71.9% subjects reported an everyday exercise habit. The yoga exercise intervention was related to the development of the dimensions of physical function (p = zero.0340) and bodily pain (p = zero.0087) of SF-36.

Table 2: Experimental Group Comparison of characteristics of menstrual flow, exercise habit, sleep status, and SF-36 scores at baseline and after three months yoga exercise intervention. (p value – paired test)

Variables Participants p-Value			
Baseline (%) After3month			
	Characteristics of menstruation		
Menstruation regularity (Irregular)	17.2	17.2	1.0000
Menstruation quantity (Heavy)	10.9	8.8	0.4142
Menstrual pain (Yes)	80.6	59.1	0.7630
Take analgesics drugs monthly			
during flow (Yes)	45.9	21.9	0.0290
Impact of menstrual pain in activity			
(Self-reported moderate or severe)	63.1	29.3	0.0011
Menstrual pain scores (mean ± SD)	77.82 +-24 +-25.7	44.8	0.0004
Exercise habit (Yes)	35.3	71.9	0.0004
Sleep status (bad)	20.3	12.5	0.1655
SHORTFORM 36			
Physical	63.6 ± 25.0	71.3 ± 12.1	0.0340
Role limitations: physical	63.2 ± 22.8	90.8 ± 24.5	0.6763
Bodily pain	51.3 ± 20.5	58.9 ± 18.7	0.0087
General health perceptions	65.9 ± 14.7	65.5 ± 16.9	0.7995
Vitality/energy	44.6 ± 14.5	53.6 ± 13.8	0.6557
Social function	65.5 ± 16.7	77.1 ± 16.4	0.8795
Role limitations: emotional	79.5 ± 28.3	85.9 ± 27.9	0.5480
Mental health	52.2 ± 12.5	63.3 ± 12.2	0.545

The 12-week yoga exercise intervention was considerably related with attenuated prevalence of 4 physical symptoms, as well as abdominal swelling (p = 0.0011), breast tenderness (p = 0.0348), abdominal cramps (p = 0.0016), and cold sweats (p = 0.0143; (Table 3) The correlation of changes within the millions of the SF-36 and menstrual pain scores at baseline and when the 3-month yoga exercise intervention is shown in (Table 4). The results incontestible that emission pain mitigation when yoga exercise was related with improvement in the SF-36, as well as physical perform (r = 0.529), bodily pain (r = 0.365), general health perception (r = 0.280), vitality/energy (r = 0.351), social event (r = 0.318), and psychological state (r = 0.3555).

Table 3: Experimental Group Comparison of self-reported moderate or severe frequency of discharge symptoms, exercise habit. (p value paired t test)

Variables Self-Reported Moderate Severe P value			
Frequency menstrual Symptoms			
	Baseline	**after 3 Months**	
Physical symptoms			
Muscle stiffness	37.81	15.6	0.1655
Faintness	0 .56	1.56	--
Abdominal swelling	40.0	13.4	0.0011 *
Dizziness, fuzzy version	32.5	15.6	0.5271
Breast tenderness	40.3	25.4	0.0348 *
Easy to fatigue	48.4	35.0	0.1797
Abdominal cramps	42.9	21.9	0.0016 *
Leg swelling	19.0	10.9	0.1317
Backache	48.4	30.5	0.1266

Somatic discomforts	25.0	12.2	0.1967
Headache	28.1	23.4	0.3657
Palpitation	13.1	08.6	0.3333
Skin allergies, itch	14.1	10.9	0.5271
Cold sweats	12.5	3.1	0.0143 *
Nausea, vomiting	6.3	6.2	0.9999
Diarrhea	14.1	10.9	0.5271
Constipation	12.5	4.7	0.0956
Weight gain	14.1	10.9	0.5271
Psychological symptoms			
Irritability	25.0	15.6	0.1573
Feeling depressed	24.1	14.6	0.7815
Crying	7.8	5.3	0.7055
Tension	15.9	8.9	1.0000
Emotional lability	20.3	12.9	0.1573

*: $p < 0.05$.

Table 4: Experimental Group Correlation of Score IN SF-36 and emission pain scores between baseline and after 3 months yoga exercise interventions.

Variable	**Positive Score Changes within the eight Scales of the S F-36 between Baseline and when three Months Yoga Exercise Intervention (after 3 Months Scores—Baseline Scores)**							
F	Physical function	Role limit	Bodily pain	General health	Vitality/ energy	social functi	Role limit	Mental state
Positive 0.0213	0.529	0.237	0.365	0.280	0.351	0.318		0.3555
changes	(p<0.0	(p>0.	(p=0.0	(p=0.0	(p=0.0	(p=0.0	(p>0.	5(p=0
inmenstr ual pain score	001)	05)	032)	257)	051)	124)	05)	004)

4. Discussion

In this study, 82.8% participants had regular emission cycles. Moderate and significant menstrual blood was reported by 85.9% of the participants and emission pain was reported by 80.6% of the participants. the more number of the participants, 63.1%, stated that moderate or severe effects of emission pain on activity, with 45.9% participants needed analgesics monthly throughout flow to alleviate emission pain. None of the participants had any gynaecological illness notable to induce emission pain, however all stated that PMS affected their well-being and quality of life. The study subjects had lower scores (i.e., larger disability) in four of the eight scales of the SF-36: bodily pain, general health perceptions, vitality/energy, and psychological state. Though the decline within the quality of life caused by flow wasn't unmanageable, different factors, similar to job stress, may influence the scores. These dimensions of health-related quality of life discovered that subjects were uncomfortable, felt tired or blue, and failed to feel as healthy as they needed. supported our results, the regular yoga exercise intervention increased the bodily pain score and physical perform millions of the SF-36. Additionally, four self-reported moderate or severe discharge symptoms (abdominal swelling, breast tenderness, abdominal cramps, and cold sweats) were considerably reduced when the 12-week yoga exercise interventions. These findings recommended that continuous yoga exercise within the regular time interval effectively reduces the symptoms of PMS and might be applied to different types of population other than school students (adolescents) to alleviate PMS.

Painful emission periods and PMS are the foremost common gynaecological issues, and are the foremost common reasons for frequent absence during school period [23]. Recent studies rumored AN association between exercise and PMS, and indicated that an everyday exercise habit would possibly decrease some physical and psychologic discharge symptoms [24, 25]. Pain, a standard symptom of PMS, may be a complicated expertise that affects mood and behavior, and might modify thought patterns resulting in activation of various brain regions throughout psychological feature tasks [25]. One study [25] incontestible that adolescents with PMS collaborating in an exceedingly short-run yoga exercise within the luteal phase felt higher and had improved attention. Another study incontestible that the mean millions of PMS and symptoms declined when eight weeks of aerobics coaching within the experimental cluster and advised that 8 weeks of aerobic exercise effectively reduces the symptoms of PMS and might be used as a treatment [24]. a rise in brain wave production induced by yoga exercise is closely related to slower respiration [25]. Yoga has positive effects on brainwave activity, and alpha brain waves are related to state of peace, relaxation, creativity, mood elevation, and therefore the unleash of serotonin; therefore, the rise in alpha brain waves suggests that participants felt additional relaxed when yoga exercise [26]. different studies investigated the mitigation of PMS effects in participants that actively performed yoga postures [17, 18, 19]. An irregular controlled trial in India incontestible Yoga pranayama observe was useful in patients with secretion imbalances, similar to hurting, period, hemorrhage, and hypomenorrhea [17]. Yoga poses (vajrasana, matyasana, bhujangasana, candra anuloma viloma pranayama, nadisuddhi pranayama, bhramari pranayama, relaxation techniques) cut back the severity and period of pms, and are a secure and straightforward treatment for premenstrual syndrome [18]. A yoga intervention reduces the severity of hurting and should be effective for lowering blood serum homocysteine levels when an intervention amount of twelve weeks [19]. These findings indicate that yoga exercise will reduce the emission pain.

Our study has some limitations. First, the study was a straightforward quasi experimental style examination before

and after intervention; thus, the results weren't obtained victimisation control group or a random allocation style. Further, no temporal relations might be assessed, and solely associations, not causing, were evaluated. second, queries of demographics, lifestyle, emission characteristics, and perceived self-reported discharge symptoms at intervals 3 months within the form were developed for this study; thus, the actual fact that normal instruments weren't applied within the gift study may have light-emitting diode to a misclassification of knowledge, Finally, future studies ought to compare the impact of various yoga protocols.

But the control group has given with Teaching –Learning session about pms symptoms, management, diet, yoga interventions which will reduce PMS.

5. Conclusion

In conclusion, within the present study, School students(adolescents) participated in short term yoga exercise intervention reported fewer physical premenstrual symptoms related to a lower risk of menstrual pain. Cognitive behavioral interventions (Yoga) which can decrease premenstrual Symptoms physically, enhances the mental status psychologically distress therby improve the health of adolescents. Yoga would possibly result in major pain acceptance, the temperament to expertise pain and acknowledge the negative thoughts and emotionsthere by managing depression and distress.

Conflicts of Interest

The authors declares no conflict of interest.

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