Original Article

Predictors of Female Health Care Providers' Knowledge on Symptoms and Risk Factors of Ovarian Cancer: A Tertiary Health Care Institutional Based Cross-sectional Study

Obinna Chinedu Nwafor[1], Emmanuel Obiora Izuka[2], Joseph Tochukwu Enebe[3], Ifeanyichukwu Jude Ofor[3], Chinelo Elizabeth Obiora-Izuka[4], Uchenna Ifeanyi Nwagha[2]

Departments of [1]Obstetrics and Gynaecology and [4]Paediatrics, University of Nigeria Teaching Hospital, [2]Department of Obstetrics and Gynaecology, College of Medicine, University of Nigeria, [3]Department of Obstetrics and Gynaecology, Enugu State University of Science and Technology Teaching Hospital, Enugu, Enugu State, Nigeria

Abstract

Context: Ovarian cancer is responsible for more deaths per year than all other gynaecological cancers combined, and its overall mortality is high because of late presentation. **Aims:** To evaluate the predictors of knowledge of the symptoms and the risk factors of ovarian cancer among female healthcare providers in Enugu, Nigeria. **Settings and Design:** Cross-sectional survey conducted at the University of Nigeria Teaching Hospital (UNTH), Enugu from June to August 2018. **Subjects and Methods:** A self-administered, structured questionnaire on symptoms and risk factors of ovarian cancer was given to 422 randomly selected female healthcare providers working at UNTH. **Statistical Analysis:** Data were analysed using SPSS version 22.0 for Windows (Chicago, IL, USA). Predictors of knowledge level were determined using logistic regression. $P < 0.05$ was considered statistically significant. **Results:** Mean age of the respondents was 39.22 ± 7.89 years. Less than 50% of participants know the other symptoms of ovarian cancer outside increased abdominal size ($n = 268$, [63.5%]). Also, <50% of participants know the other risk factors of ovarian cancer outside family history of cancer ($n = 288$, [68.2%]) and genetic predisposition ($n = 251$, [59.5%]). Female doctors are less likely not to know about the symptoms (odds ratio [OR] = 0.011, 95% confidence interval [CI] = 0.004–0.024, $P < 0.001$) and risk factors (OR = 0.005, 95% CI = 0.002–0.013, $P < 0.001$) of ovarian cancer. **Conclusions:** Female healthcare providers had a reduced level of awareness of the risk factors and symptoms of ovarian cancer, while female doctors are less likely not to know about the symptoms and the risk factors.

Keywords: Female health care workers, knowledge, ovarian cancer, predictors, risk factors, symptoms

Introduction

Cancer of the ovary is one of the significant causes of morbidity and mortality among women.[1] Ovarian cancer is responsible for more death per year than all other gynaecological cancers combined.[2] The American Cancer Society estimates that 22,440 women will be diagnosed with ovarian cancer, and 14,080 are expected to die from it in 2017.[2] The current lifetime risk is 1 per 70 women, with an incidence of approximately 22 per 100,000 population and a peak age incidence of 67 years.[3,4] In the UK, there are about 7000 new cases of ovarian cancer diagnosed annually with about 4370 deaths, and the 5 years overall survival is around 40%.[4]

Ovarian cancer is the fourth most common cause of cancer deaths worldwide and also the most frequent cause of death among all gynaecological cancers.[2,5,6] This high case fatality rate is mostly due to the absence of specific signs and symptoms in the early stages of the disease and lack of adequate screening.

Address for correspondence: Dr. Emmanuel Obiora Izuka, Department of Obstetrics and Gynaecology, College of Medicine, University of Nigeria, Ituku-Ozalla, Enugu, Enugu State, Nigeria.
E-mail: izuksman@yahoo.com

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Hence most ovarian cancers are diagnosed in advanced Stages 3 and 4 with a 5-year survival rate of 30%–40%.[7,8]

In Nigeria, previous studies done gave the incidence of ovarian cancer as 7%–22%;[9-15] however, a more recent study done at the University of Nigeria Teaching Hospital (UNTH) revealed an incidence of 25%.[8] This study also revealed a rising incidence of ovarian cancer in the study centre.

Signs and symptoms of early ovarian cancer could be varied and vague at best, many attribute them to be benign symptoms of the digestive and/or urinary systems. It was erroneously thought that early symptoms of ovarian cancer are silent. Still, a new study shows that although symptoms are not specific, increasing appearance and duration of symptoms over a while should raise a practitioner's suspicions towards this disease.[16-20] It was observed that symptoms are noted 12 or more times a month during 12 months or less; or new onset of abdominal pains, bloating, easy satiety, anorexia, urinary symptoms occurring almost daily and lasting over 3 weeks.[21]

As with most cancers, the exact cause is unknown; however, risk factors do exist. Some risk factors reported in previous studies include family history, age >50 years, nulliparity, early menarche, late menopause, fertility treatment, late onset of childbearing, history of breast cancer, obesity and use of hormone replacement therapy.[4,8,16]

Increased awareness of these symptoms and risk factors of ovarian cancer amongst women and their primary care providers may lead to quicker diagnosis of ovarian cancer, with a subsequent reduction in treatment-related morbidity and possibly increased survival.[3] However, despite numerous national ovarian cancer organisations raising awareness in the United States of America, studies have shown that identification of ovarian cancer symptoms and risk factors is weak among women and there is a knowledge deficit among health care providers.[3] Similar studies among working Malaysian women also demonstrated poor knowledge of risk factors and symptoms of ovarian cancer.[17,18]

Additionally, a knowledge deficit was noted by Fallowfield *et al*., in a prerandomisation study done among women that participated in the United Kingdom Collaborative Trial of Ovarian Cancer Screening.[22] An intervention follow-up study done in Egypt observed low awareness among working Egyptian women about risk factors, signs and symptoms of ovarian cancer but noted that health education session about ovarian cancer had a significant effect in the form of a remarkable increase in the level of knowledge about the disease.[19]

A recent hospital-based study in South-western Nigeria observed that the level of awareness of ovarian cancer symptoms is very low among the female health workers and that there is a poor medical help-seeking habit among those participants that could identify those symptoms.[23]

Ofinran *et al*., in a hospital-based UK. study, found that occupation was a significant predictor of knowledge of signs and symptoms of ovarian cancer and that nurses that work with in-patients were found to have a good understanding of signs and symptoms of ovarian cancer, but noted that their knowledge of risk factors was poor.[7] More so, Elmahdi *et al*. in a cross-sectional study of 366 female nonacademic staff in the University of Putra, Malaysia in 2015 noted that age (older ages) and to have heard or read about ovarian cancer were the significant predictive factors of knowledge of symptoms and risk factors of ovarian cancer among female non academic staff in the university.[24]

The media globally has focused so much on breast and cervical cancer screening giving it some high level of understanding among women. Little has been done to emphasize the importance of ovarian cancer screening. Also, globally, there is a lack of data on the predictors of knowledge of symptoms and risk factors of ovarian cancer among women. The factors that determine or predict the knowledge levels have not been thoroughly studied especially in a resource-limited setting. Although a consensus among researchers on the signs and symptoms of ovarian cancer has evolved, whether women themselves know isn't clear.[25]

Healthcare providers are a source of health information to the patients and general populace. Unfortunately, their knowledge of the risk factors, signs and symptoms of ovarian cancer is not explicit. What predicts the experience or level of knowledge also is not precise. Thus, the development of policies or review of existing ones that will help change the behaviour and understanding of ovarian cancer among female health care providers cannot be overemphasised. It is thus imperative we have background knowledge about what they know as well as determine the predictors of knowledge about the symptoms and the risk factors of ovarian cancer and its prevention.

Subjects and Methods

Study centre

The study was conducted at the UNTH, Ituku-Ozalla, Enugu; a tertiary institution serving as a principal referral centre for patients from the neighbouring states of Anambra, Ebonyi, Benue, Imo and Abia. It is also a training and research institution.

Study population

The participants for the study were drawn from female healthcare providers in the study institution. They included doctors, pharmacists, physiotherapists, nurses, radiographers and laboratory scientists.

Eligibility criteria

All-female healthcare providers who gave their consent were eligible for this study.

Exclusion criteria

Women diagnosed with ovarian cancer and those directly treating cancer patients were excluded from this study.

Study design

The study was a cross-sectional survey. Using a three-staged sampling technique, the participants were selected from all the departments in the hospital. In the first stage, all the departments of the hospital were selected for the study. In the second stage, a proportionate sampling technique was used to allocate the number of participants selected from each department. Lastly, utilizing a simple random method, computer-generated random numbers were used to choose consenting eligible participants from the various departments of the institution.

Healthcare provider was defined as an individual directly involved in the provision of preventive, curative, promotional or rehabilitative health care services in a systematic way to people, families, or communities. The study was carried out over 12 weeks period, from June 1 to August 31, 2017.

Sample size determination

The sample size for the study was calculated to be 422 participants using $n = Z^2pq/d^2$ formula.[26] The normal standard deviation (Z) corresponding to a 95% level of significance or confidence interval was 1.96, the degree of precision (d) was set at 5%, the prevalence was set at 50%, and an attrition rate of 10% was used.

Ethical considerations

Permission for this study was obtained from the Health Ethics and Research Committee of UNTH with reference number NHREC/05/01/2008B-FWA00002458-1RB00002323. Voluntariness in participation and confidentiality was ensured throughout the study. Verbal informed consent was obtained from each respondent before the administration of the questionnaire.

Data collection

A structured, pretested, validated, self-administered questionnaire adapted from the Ovarian Cancer Awareness Measure toolkit, which is a site-specific version of the generic Cancer Awareness Measure, was used to extract information from the participants. The questionnaire consisted of three sections: sections A, B and C. Section A was on sociodemographic characteristics; section B assessed the knowledge of symptoms of ovarian cancer while section C assessed knowledge of risk factors. Three incorrect options were added to examine possible response bias. Five research assistants were trained, and they helped in data collection.

Validity and reliability of the instrument

Two research experts validated the questionnaire, a consultant obstetrician and gynaecologist and a medical statistician. A pilot study was conducted, and 20 questionnaires were administered to test for internal consistency of responses. We employed the split-half test (we divided the 20 questionnaires into two groups and then compared as if they were two separate administrations) instead of the test-retest technique, to avoid bias. The result showed that the Cronbach's alpha coefficient for each of the split halves 1 and 2 were 0.626 and 0.708 respectively, and the correlation between forms was 0.758 indicating robust reliability.

Method of data analysis

Data collated was analyzed using SPSS version 22.0 for Windows (Chicago, IL, USA). Categorical variables were presented as frequency and percentages while means and standard deviations were obtained for continuous variables. Predictors of outcome variables were done using logistic regression. $P < 0.05$ was considered statistically significant.

Results

A total of 430 questionnaires were distributed, and 422 were correctly filled giving a 98.1% response rate. The mean age of the respondents was 39.22 ± 7.89 years. Most respondents were predominantly nurses (63.5%), and most of them were married (95.3%). The majority of respondents were Christians (99.5%) and from the Igbo tribe (98.8%). Professional businessman and civil servant were the predominant occupations of the husbands of the female health workers. Table 1 shows the details of the sociodemographic of the respondents.

Knowledge of symptoms of ovarian cancer

Majority of the female health care providers (63.5%) know that increased abdominal size is a symptom of ovarian cancer.

Table 1: Sociodemographic characteristics of the female health care providers

	Frequency (n=422), n (%)
Age group	
20-29	49 (11.6)
30-39	172 (40.8)
40-49	144 (34.1)
50-59	56 (13.3)
60-69	1 (0.2)
Occupation	
Medical doctors	55 (13.0)
Nurses	268 (63.5)
Lab scientists	46 (10.9)
Pharmacists	33 (7.8)
Physiotherapists	8 (1.9)
Radiographers	12 (2.9)
Marital status	
Single	20 (4.7)
Married	402 (95.3)
Religion	
Christianity	420 (99.5)
Muslim	2 (0.5)
Tribe	
Igbo	417 (98.8)
Yoruba	3 (0.7)
Hausa	2 (0.5)
Husband's occupation	
Professional/bigtime businessman	241 (57.1)
Civil servant/middle-level trader	177 (41.9)
Small scale trader	4 (1.0)

However, less than half of them know the symptoms of ovarian cancer to include: Persistent pain in the abdomen (36.5%), persistent pain in the pelvis (38.4%), vaginal bleeding after menopause (34.1%), persistent bloating (28.4%), feeling full persistently (34.8%), inability to finish a meal/early satiety (27.7%), increased frequency of urination (18.0%), a change in bowel habits (37.7%), frequent headache (18.7%), continuous fever (15.2%), abnormal Pap smear (39.1%). The proportion of the respondents with good knowledge of ovarian cancer was only 5%. The details of the knowledge of symptoms of ovarian cancer are as shown in Table 2 and Figure 1.

Knowledge of risk factors of ovarian cancer

Majority of the female health care providers (68.2% and 59.5%) know that family history of cancer (ovary, breast, colon) and genetic predisposition are risk factors for ovarian cancer. However, less than half of them know the risk factors of ovarian cancer to include: History of breast cancer (42.7%), age above 50 years (39.3%), frequent ovulation (28.0%), oestrogen-only pills (26.3%), smoking (54.7%), not having children (16.6%), being overweight (25.8%), having endometriosis (21.8%), having an ovarian cyst (39.1%), having late menopause (27.7%), having early menarche (27.3%), use of ovulation-inducing drugs (21.3%) and using talcum powder in the genital area (28.9%). Only 11.8% of the respondents have good knowledge of the risk factors of ovarian cancer. The details of the understanding of the risk factors of ovarian cancer among the respondents are as shown in Table 3 and Figure 2.

Table 2: Knowledge of symptoms of ovarian cancer

	Yes, *n* (%)	No, *n* (%)	Don't know, *n* (%)
Persistent pain in the abdomen	154 (36.5)	101 (23.9)	167 (39.6)
Persistent pain in the pelvis	162 (38.4)	81 (19.2)	179 (42.4)
Vaginal bleeding after menopause	144 (34.1)	117 (27.7)	161 (38.2)
Persistent bloating	120 (28.4)	122 (28.9)	180 (42.7)
Increased abdominal size	268 (63.5)	44 (10.4)	110 (26.1)
Feeling full persistently	147 (34.8)	103 (24.4)	172 (40.8)
Inability to finish a meal/ early satiety	117 (27.7)	149 (35.3)	156 (37.0)
Increased frequency of urination	76 (18.0)	144 (34.1)	202 (47.9)
A change in bowel habits	159 (37.7)	108 (25.6)	155 (36.7)
Frequent headache	79 (18.7)	168 (39.8)	175 (41.5)
Continuous fever	64 (15.2)	173 (41.0)	185 (43.8)
Abnormal pap smear	165 (39.1)	128 (30.3)	129 (30.6)

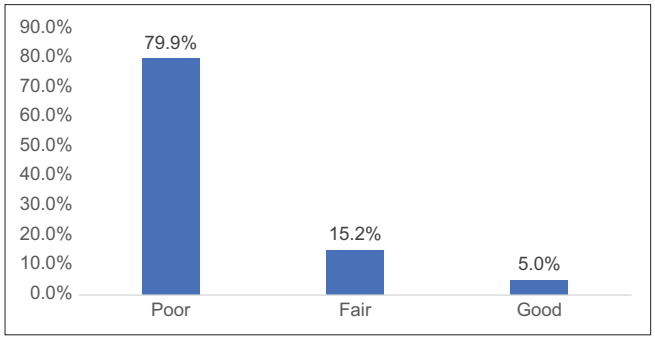

Figure 1: Proportion of female health workers with knowledge of symptoms of ovarian cancer

Predictors of knowledge of symptoms of ovarian cancer among female healthcare providers

We found that occupation was a significant predictor of awareness of symptoms of ovarian cancer among female healthcare providers (odds ratio [OR] = 0.011, 95% confidence interval [CI] = 0.004–0.028, $P < 0.001$). Female medical doctors were less likely not to know about symptoms of ovarian cancer than other female healthcare providers. No significant association was found for the rest of the demographic characteristics tested ($P > 0.05$). The details of the predictors of knowledge of symptoms of ovarian cancer are as documented in Table 4.

Predictors of knowledge of risk factors of ovarian cancer among female healthcare providers

We noted that occupation was a significant predictor of understanding of risk factors of ovarian cancer among female healthcare providers (OR = 0.005, 95% CI = 0.002–0.013, $P < 0.001$). Female medical doctors were less likely not to know about risk factors of ovarian cancer than other female healthcare providers. No significant association was found for the rest of the demographic characteristics tested ($P > 0.05$). Details are shown in Table 5.

Discussion

Healthcare professionals must know the risk factors and symptoms of ovarian cancer to impact the knowledge to women seeking health care in the clinics. Even more critical is for healthcare professionals and women seeking health care to know the factors that predict or determine the knowledge of the risk factors and symptoms. This may help women detect possible early symptoms that may point towards ovarian cancer.

From our study, majority of the women (63.5%) know only one of the listed symptoms (increased abdominal size)

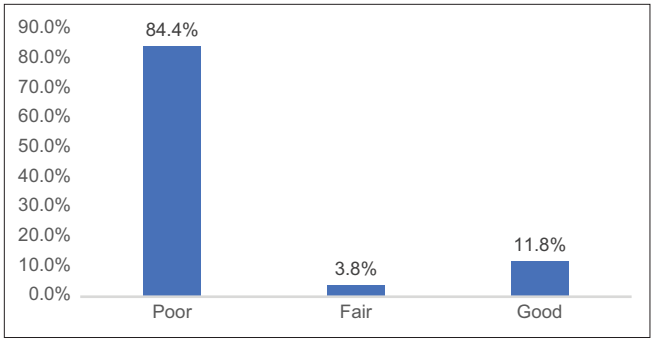

Figure 2: Proportion of female health workers with knowledge of risk factors of ovarian cancer

of ovarian cancer; the remaining symptoms are not well understood (<50%). This is similar to results in a study by Adeyemi *et al*.[23] The proportion of respondents with good knowledge of symptoms of ovarian cancer is abysmally poor for health care workers. This is lower than values gotten from nurses working in the gynaecology department of a UK hospital by Ofinran *et al*. They recorded 53% of the nurses working in in-patients having a good knowledge of the signs and symptoms for ovarian cancer compared to nurses that work in outpatients.[7] This may be due to the study population being just nurses working at the gynaecology department.

Table 3: Knowledge of risk factors of ovarian cancer

	Yes, *n* (%)	No, *n* (%)	Don't know, *n* (%)
Family history of cancer (ovary, breast, colon)	288 (68.2)	43 (10.2)	91 (21.6)
History of breast cancer	180 (42.7)	93 (22.0)	149 (35.3)
Genetic predisposition	251 (59.5)	63 (14.9)	108 (25.6)
Age above 50 years	166 (39.3)	104 (24.6)	152 (36.0)
Frequent ovulation	118 (28.0)	137 (32.5)	167 (39.6)
Oestrogen-only pills	111 (26.3)	113 (26.8)	198 (46.9)
Smoking	231 (54.7)	53 (12.6)	138 (32.7)
Not having children	70 (16.6)	151 (35.8)	201 (47.6)
Being overweight	109 (25.8)	120 (28.4)	193 (45.7)
Having endometriosis	92 (21.8)	130 (30.8)	200 (47.4)
Having an ovarian cyst	165 (39.1)	91 (21.6)	166 (39.3)
Having late menopause	117 (27.7)	125 (29.6)	180 (42.7)
Having early menarche	115 (27.3)	125 (29.6)	182 (43.1)
Use of ovulation-inducing drugs	90 (21.3)	95 (22.5)	237 (56.2)
Using talcum powder in the genital area	122 (28.9)	115 (27.3)	185 (43.8)

Majority of the female health workers do not have a good knowledge of the risk factors of Ovarian cancer and the observation cuts across most studies, both local and international.[7,23] Our study revealed only 11.8% of respondents had good knowledge of risk factors for ovarian cancer. Ofinran *et al*. in their study reported 33% of respondents had an excellent understanding of risk factors. Though this was better than in our study, the result also shows a poor knowledge of risk factors for ovarian cancer among the respondents. Ofinran *et al*. also reported that 27% of the respondents did not know risk factors. This insufficient knowledge about risk factors and symptoms of ovarian cancer amongst health care providers mirrors the results seen on the general population (nonhealthcare providers).[7,17-19,22] This buttresses the fact of poor information dissemination on ovarian cancer from health care providers to the general population. Keng *et al*. reported 71.3% of respondents had a low level of awareness of ovarian cancer risk factors.[18] This is similar to the 85% obtained by Lockwood *et al*. and relates to reduced information deficit by health care providers, as found in our study.

Mohamed and Elkader in their study[19] showed that respondent knowledge about ovarian cancer improved after an educational session with women working in different faculties in Mansoura University, Egypt. This supports the need for increased continuous acquisition of new information on ovarian cancer on both the healthcare practitioners and the general populace.

In our study, we reported a significant association of knowledge of symptoms and risk factors of ovarian cancer and the

Table 4: Predictors of knowledge of symptoms of ovarian cancer amongst female healthcare providers

	Predictors of knowledge of symptoms of ovarian cancer		*P*	OR	95% CI for OR
	Poor, *n* (%)	Good, *n* (%)			
Age					
≤49	289 (78.7)	78 (21.3)	0.147	0.540	0.235-1.241
>49	48 (87.3)	7 (12.7)			
Occupation					
Doctors	5 (9.1)	50 (90.9)	<0.001	0.011	0.004-0.028
Others	332 (90.5)	35 (9.5)			
Marital status					
Single	14 (70.0)	6 (30.0)	0.266	0.571	0.213-1.532
Married	323 (80.3)	79 (19.7)			
Religion					
Christianity	335 (79.8)	85 (20.2)	NA	NA	NA
Muslim	2 (100.0)	0 (0.0)			
Tribe					
Igbo	332 (79.6)	85 (20.4)	NA	NA	NA
Others	5 (100.0)	0 (0.0)			
Parity					
1-4	271 (78.6)	74 (21.4)	0.160	0.610	0.307-1.215
>4	66 (85.7)	11 (14.3)			

NA: Not applicable, OR: Odds ratio, CI: Confidence interval

Table 5: Predictors of knowledge of risk factors of ovarian cancer amongst female healthcare providers

	Predictors of knowledge of risk factors		*P*	OR	95% CI for OR
	Poor, *n* (%)	Good, *n* (%)			
Age					
≤49	307 (83.7)	60 (16.3)	0.304	0.627	0.257-1.528
>49	49 (89.1)	6 (10.9)			
Occupation					
Doctors	5 (9.1)	50 (90.9)	<0.001	0.005	0.002-0.013
Others	351 (95.6)	16 (4.4)			
Marital status					
Single	15 (75.0)	5 (25.0)	0.244	0.537	0.188-1.531
Married	341 (84.8)	61 (15.2)			
Religion					
Christianity	354 (84.3)	66 (15.7)	NA	NA	NA
Muslim	2 (100.0)	0 (0.0)			
Tribe					
Igbo	351 (84.2)	66 (15.8)	NA	NA	NA
Others	5 (100.0)	0 (0.0)			
Parity					
1-4	288 (83.5)	57 (16.5)	0.294	0.669	0.316-1.417
>4	68 (88.3)	9 (11.7)			

NA: Not applicable, OR: Odds ratio, CI: Confidence interval

occupation of the respondents. Female medical doctors have a better understanding of both symptoms and risk factors of ovarian cancer than other healthcare providers. This may be due to their level of training and exposure and that they have more contacts with ovarian cancer patients than other healthcare providers. However, this contrasts with the findings of Ofinran *et al*.,[7] who reported nurses that work in in-patient to be a significant predictor of knowledge of symptoms and risk factors of ovarian cancer. Our result also contrasts with that of Elmahdi *et al*.[24] who reported respondents' age (older age) and to have heard or read about ovarian cancer as the predictors of knowledge of symptoms and risk factors of ovarian cancer. These differences might be because of the different study populations. Generally, health care providers have a better understanding of ovarian cancer compared to the general population. Goldstein *et al*. reported similar findings when they compared the risk factors of ovarian cancer in a community of women and healthcare providers.[3]

The study, however, is limited because it is a single-centre, questionnaire-based, non interventional study. A multicentre community-based study would have been more appropriate. This limitation will be addressed in future studies.

Conclusions

This study highlights the low level of knowledge of risk factors and symptoms of ovarian cancer amongst female healthcare providers. Occupation, however, was a significant predictor of the understanding of symptoms and risk factors of ovarian cancer with female doctors less likely not to know the signs and risk factors of ovarian cancer. Proper education and awareness creation are therefore recommended firstly, to health care providers and then to the populace on the risk factors and symptoms of ovarian cancer to mitigate the dangers of late presentation.

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Conflicts of interest

There are no conflicts of interest.

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