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Original Article

Assessing HIV/AIDS Knowledge and Stigmatising Attitudes Among Clinical Medical Students at IMU University, Malaysia

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Abstract

Introduction: Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) continue to be significant global public health issues, affecting millions of people worldwide. Despite ongoing efforts in education and awareness, misconceptions and stigmatising attitudes toward individuals living with HIV/AIDS persist in many communities, including among future healthcare professionals. This study was designed to evaluate both the level of HIV/AIDS-related knowledge and the extent of stigmatising attitudes among clinical medical students enrolled at the IMU University in Malaysia. **Methods:** A cross-sectional study was carried out using stratified random sampling at a private higher education institution, IMU University Malaysia. The study population consisted of clinical-year medical students from semesters 6, 7, 8, and 9. After stratifying the students by semester, simple random sampling was used to select participants from each group. Data collection was conducted using self-administered questionnaires that included sections on sociodemographic information, a set of items designed to assess knowledge and misconceptions related to HIV/AIDS, and a separate set of items aimed at evaluating attitudes and stigma toward people living with HIV/AIDS. **Results:** The study achieved a high response rate of 96%, with a total of 180 participants. Statistical analysis revealed there is no significant association between students' semester level and their HIV/AIDS knowledge score (p value = 0.39), nor between semester level and HIV stigma score (p value = 0.17). Furthermore, there was no significant correlation between HIV/AIDS knowledge and stigmatising attitudes (p value = 0.85), with a Pearson correlation coefficient of r = -0.129. **Conclusion:** The findings suggest that HIV/AIDS stigma is influenced by multiple factors beyond knowledge, emphasising the need for comprehensive public health interventions.

Keywords: *AIDS; HIV; Knowledge; Medical Students; Stigma*

Introduction

The Human Immunodeficiency Virus (HIV) is a global health concern that has had a profound impact on individuals, communities and societies. Since its identification in the early 1980s, significant progress has been made in understanding, treating and preventing HIV (WHO, 2024). The first case of HIV/AIDS in Malaysia was reported from the University Hospital Kuala Lumpur in late 1986 (Goh *et al*., 1987). Since then, the number of People Living With HIV/AIDS (PLWHA) has increased, with the estimated number of PLWHA in Malaysia being 86,142 at the end of the year 2022 (MOH, 2023). HIV primarily spreads through unprotected sexual intercourse, sharing contaminated needles, and mother-to-child transmission during childbirth or breastfeeding. The HIV virus targets and attacks cells of the immune

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system, specifically CD4+ T cells, impairing their ability to defend the body against infections and diseases. As the virus replicates and spreads, the immune system weakens, leading to a condition known as Acquired Immunodeficiency Syndrome (AIDS) (Swinkels *et al*., 2024; Peña Donati & Laufer, 2020). The global HIV response aims to reduce new infections, stigma, discrimination, and HIV-related mortality. Achieving these goals requires addressing societal barriers and investing in community-led programs to eliminate stigma and inequality (Frescura *et al*., 2022).

Challenges remain in combating this virus and achieving a world free of AIDS. Stigma and discrimination associated with HIV/AIDS continue to hinder efforts to address the epidemic. Limited knowledge about HIV transmission, prevention, and healthcare services contributes to delayed diagnosis (Bin Ahmad *et al*., 2024). PLWHA often face social isolation, prejudice and barriers to accessing healthcare (Fauk *et al*., 2021a). The stigmatist behaviour of HIV has a dangerous effect on the healthcare system, as these negative attitudes can cause many forms of negligence in the treatment plan for a patient (Garett & Young, 2021). Lazarus *et al*. (2021) emphasised that stigma and discrimination significantly hinder health outcomes and effective HIV responses. Alarmingly, PLWHA worldwide still face discrimination in healthcare settings, including excessive infection control measures, extended wait times, disrespect, negligence, breaches of confidentiality, delayed or denied treatment and inadequate support services (Lazarus *et al*., 2021). This is further supported by the current study, which found that younger healthcare providers, limited work experience and fear of contracting HIV while treating PLWHA contribute to HIV-related stigma (Shrestha *et al*., 2024; Ljubas, Škornjak & Božičević, 2024). Healthcare workers claimed to be afraid of catching HIV from patients, preferring to have less personal contact, favouring patients who are HIV-negative and taking extra precautions (Shrestha *et al*., 2024). Moreover, HIV stigma among healthcare providers was associated with modifiable factors such as beliefs about HIV and procreation, feelings of responsibility for HIV preventative services, comfort in discussing sexual health and drug use, and overall knowledge of HIV (Spence *et al*., 2022). Therefore, stigma reduction efforts should focus on alleviating these fears to promote better patient care.

Yapıcı and Çağlar (2024) advocate for the widespread use of educational initiatives to fight against HIV/AIDS stigma, especially in healthcare settings. Increased level of knowledge of HIV/AIDS was associated with more positive attitudes (Youssef *et al*., 2021). Another study conducted among healthcare workers in Saudi Arabia found that those with strong HIV-related knowledge and had received in-service training for PLWHA exhibited lower levels of stigma and discrimination, this emphasises the importance of continuous education and training among healthcare workers in ensuring effective and appropriate care for PLWHA (Alharbi *et al*., 2022). Enhancing HIV care system is crucial to meeting the needs of PLWHA, this promotes early treatment initiation, improve adherence and ultimately help increase CD4 count while suppressing viral load (Fauk *et al*., 2021b). Promoting acceptance, correcting misconceptions and improving access to accurate information can encourage early testing and timely care, ultimately enhancing health outcomes for PLWHA (Bin Ahmad *et al*., 2024).

Stigma and discrimination against PLWHA stem from misconceptions, excessive fear, social stigma, and the belief that they violate religious and societal norms (Asrina *et al*., 2023). The stigma of HIV also has effects on cultural and religious aspects. Many Eastern cultures and different religious practices have judgmental connotations towards PLWHA. This causes PLWHA to detach from their cultural background and religious practices, this is an issue because many people incorporate their cultural and religious practices as an aspect of their personality. Hence, PLWHA may start to lose their sense of identity (Fauk *et al*., 2021c).

Fear drives HIV/AIDS stigma. People often view it as an incurable, life-threatening disease. PLWHA often feel discomfort, anxiety, and shame, as a result, they may isolate themselves, withdraw from social activities, and feel unworthy of belonging to their families or communities due to their condition (Asrina *et al*., 2023). PLWHA are not solely affected by the stigma, their close friends and family members also undergo social isolation, because they are seen as associates with the person, this can cause distress and hence the possibility that they may distance themselves from them (Fauk *et al*., 2021a). The challenges faced by PLWHA can significantly affect their mental health, leading to

depression, anxiety and overwhelming stress, which further impact their lives (Turan *et al*., 2016). One study conducted in Kota Bharu, Malaysia showed that psychological and social well-being were impacted more than physical well-being among PLWHA (Hasanah *et al*., 2011).

A few studies have looked into how HIV is stigmatised in Malaysia. A 2013 cross-sectional study by University Putra Malaysia explored HIV/AIDS knowledge and stigma among medical students, to identify knowledge gaps and biases that may exist among this group. Findings showed preclinical students had more stigmatising attitudes toward imposed measures, while clinical students were less comfortable handling PLWHA. This study highlights the effectiveness of HIV/AIDS education programs and the need for interventions to reduce stigma among future healthcare professionals (Chew & Cheong, 2013).

The stigma needs to be identified among the community, so it can 'break' the negative stigma and treat everyone with equality. A major factor that contributes to the negative opinions regarding HIV is the misinformation that is known by the general population (Garett & Young, 2021). HIV is viewed negatively because it is commonly associated with high-risk behaviours like sexual promiscuity and morally repugnant activities like drug misuse and homosexuality (Shrestha *et al*., 2024). Many older adults mistakenly believe that HIV/AIDS only affects homosexual men, female sex workers, and drug users (Sun *et al*., 2022). The incorrect information allows people to make unjust opinions about an individual and therefore causes isolation and separation from society, hence the correct information of HIV must be taught to the society, for the betterment of all individuals (Turan *et al*., 2016).

Methodology

Study Setting and Population

This is a cross sectional analytical observational study which was done through a survey. The data collection was prospective. The period of data collection was done from 1st November 2023 to 15th December 2023. The objective of the study is to determine the relationship between HIV/AIDS-related knowledge and stigmatising attitudes of IMU clinical medical students towards HIV/AIDS patients. Subjects selected for this study will be registered medical (MBBS) students – Semester 6, 7, 8 and 9 in IMU University, clinical school, Seremban. The estimated sample size was calculated using Cochran's formula. Estimates of IMU MBBS students at Seremban campus was 365, recommended sample size 188 was calculated. Inclusion criteria include medical students who understand English and currently studying in IMU Seremban campus in the MBBS program. No exclusion criteria.

Study Instruments

The construction of the questionnaire was adopted from Amboss and previous relevant studies. (Chew & Cheong, 2013). The first section consists of demographic data of the participants (age and current semester) while the subsequent part consists of a total of 32 questions, 11 questions to assess HIV/AIDS knowledge, 8 questions to assess misconception about HIV and 13 questions from HIV stigmatisation scale. The questions were designed to be challenging for medical students.

11 True/False questions to assess HIV/AIDS knowledge include: (1) Human immunodeficiency virus (HIV) eventually progresses to acquired immunodeficiency syndrome (AIDS); (2) Postexposure prophylaxis, PEP is indicated for contamination of open wounds or mucous membrane with HIV-contaminated bodily fluid; (3) Opportunistic infection is one of the commonest complications in AIDS patient; (4) Postexposure prophylaxis for HIV is likely to be effective even if started 72 hours after exposure; (5) Tuberculosis develops typically from primary infection and rarely from reactivation of a latent infection in HIV-infected patient; (6) HIV can be transmitted from a pregnant mother to the foetus through the placenta; (7) Highest risk of HIV transmission is associated with vertical transmission during childbirth; (8) It is safe for a mother with a sustained undetectable HIV viral load during pregnancy to breastfeed her child; (9) HIV viral load can be suppressed by antiretroviral medications; (10) HIV-infected patient is treated with monotherapy antiretroviral medication; (11) CD4 count should only be monitored when AIDS symptoms worsen despite antiretroviral therapy.

8 True/False questions to assess misconception about HIV include: (1) Pre-exposure prophylaxis, or PrEP, prevents HIV transmission even when a condom is not used during sexual intercourse; (2) HIV-infected patient with undetectable HIV viral load is unable to infect his/her sexual partner; (3) HIV can be transmitted from infected man to an uninfected man through unprotected anal intercourse. (4) HIV is transmitted through blood sucking insect's bite; (5) Every HIV-infected patient should be started with Highly Active Antiretroviral Therapy (HAART); (6) Sharing bathrooms with someone tested positive for HIV increases the risk of transmission of HIV; (7) Individual with a low CD4 count is HIV positive; (8) HIV antibody test is a definitive diagnostic test for HIV.

The construction of the HIV stigmatisation scale (HIV-stigma scale) was based on items adopted and modified from a previous study titled HIV Knowledge and Stigmatising Attitude towards People Living with HIV/AIDS among Medical Students in Jordan (Sallam *et al*., 2022). The HIV-stigma scale involved 13 items; each was scored using a 5-point Likert scale (highly agree, agree, neutral, disagree, and highly disagree). Internal consistency of the HIV-stigma scale was ensured by Cronbach's value of 0.855 indicating good reliability of the scale. For 13 items, the scoring system was as follows: highly disagree (+2), disagree (+1), neutral (zero), agree (1), and highly agree (2); and these items included: (1) People with HIV/AIDS got what they deserve; (2) It is hard for me to like people who exposed themselves and society to HIV/AIDS; (3) People with AIDS should be quarantined; (4) Sexual relations should be prohibited for those with HIV/AIDS; (5) Students with HIV/AIDS should be expelled from medical studies; (6) If I would have had HIV/AIDS, I would be ashamed of it; (7) Other students should be notified if one of the medical students is HIV-positive; (8) A physician who is HIV-positive should not be allowed to work even with the appropriate precautions; (9) I believe I have the full right to refuse treating a person with HIV/AIDS; (10) I wish not to treat persons with HIV/AIDS; (11) I would warn other medical staff about a patient's HIV status even against that patient's request; (12) if, as an intern, you had to care for a person with HIV/AIDS, would you feel anxious? and (13) I am concerned that working with people who have HIV/AIDS may endanger my health.

Statistical analysis

The data analysis performed using Microsoft Excel and IBM SPSS statistics. Data of all participants who completed the assessment was included for analysis. Associations between categorical variables were assessed using the chi-squared test, while linear relationship between 2 continuous variables using Pearson correlation coefficient. Multinomial regression analyses used as appropriate and the statistical significance was considered for $p < 0.050$ as the cut-off.

Ethical Consideration

The researchers obtained ethical clearance from Joint-Committee of International Medical University, Malaysia with the reference number CSc-Sem6(12)2023 on 1st June, 2023.

Results

Table 1: Student Age

Age	Frequency	Percentage (%)
19	1	0.6
20	5	2.8
21	27	15.0
22	65	36.1
23	61	33.9
24	12	6.7
25	2	1.1
26	5	2.8
27	2	1.1

There was a total of 180 participants with age ranging from 19 years old to 27 years old from the collected sample. The sample consists of 1 (0.6%) 19 years old, 5 (2.8%) 20 years old, 27 (15.0%) 21 years old, 65 (36.1%) 22 years old, 61 (33.9%) 23 years old, 12 (6.7%) 24 years old, 2 (1.1%) 25 years old, 5 (2.8%) 26 years old and 2 (1.1%) 27 years old (Table 1).

Table 2: Student Semester

Semester	Frequency	Percentage (%)
6	46	25.6
7	60	33.3
8	49	27.2
9	25	13.9

In Table 2 where 46 (25.6%) participants were from semester 6, 60 (33.3%) were from semester 7, 49 (27.2%) were from semester 8 and 25 (13.9%) were from semester 9.

Table 3: Mean Score for HIV/AIDS Knowledge According to Semester

Semester	Mean score (out of 19)
6	13.04
7	13.28
8	12.69
9	13.28
Overall mean score: 13.06/19	

Table 4: Significant (p value) between Different Semester Students and HIV/AIDS Knowledge Score

Significant (*p* value) between different semester students and HIV/AIDS knowledge score	0.39

Lowest score for HIV/AIDS knowledge was 7 and the highest score for HIV/AIDS knowledge was 17. The mean HIV/AIDS knowledge score for semester 6 students was 13.04, for semester 7 students was 13.28, for semester 8 students was 12.69 and semester 9 students was 13.28. The overall mean HIV/AIDS knowledge score was 13.06. There was no association between different semester students and HIV/AIDS knowledge score (Table 3). Significance (p value) was 0.39, therefore, not statistically significant (Table 4).

Table 5: Mean Score for HIV Stigma According to Semester

Semester	Mean Score (out of 52)
6	17.89
7	16.60
8	20.57
9	16.12
Overall mean score: 17.94/52	

Table 6: Significant (p value) between Different Semester Students and HIV Stigma Score

Significant (*p* value) between different semester students and HIV stigma score	0.17

Lowest stigma score was 0 and the highest stigma score was 52. The mean HIV stigma score for semester 6 students was 17.89, for semester 7 students was 16.6, for semester 8 was 20.57 and semester 9 was 16.12. The overall mean HIV stigma score was 17.94. There was no association between different semester students and HIV stigma score (Table 5). Significance (*p* value) was 0.17, therefore, not statistically significant (Table 6).

Table 7: Reliability of HIV/AIDS Knowledge Questions

Cronbach's Alpha	0.096

The Cronbach's Alpha value generated for HIV/AIDS knowledge questions was 0.096 indicating unacceptable internal consistency among the items in a scale or questionnaire (Table 7).

Table 8: Reliability of Stigma Questions

Cronbach's Alpha	0.855

The Cronbach's Alpha value generated for HIV stigma questions was 0.855 indicating good internal consistency among the items in a scale or questionnaire (Table 8).

Table 9: Correlations between HIV/AIDS Knowledge and HIV Stigma Score

Correlations between HIV/AIDS Knowledge and Stigma	Score
Pearson correlation	-0.129
Significance (*p* value)	0.85
Lower 95% confidence interval	-0.270
Upper 95% confidence interval	0.018

The Pearson correlation coefficient (r) between HIV/AIDS knowledge and HIV stigma score was -0.129, indicating a negligible correlation. The p value associated with the correlation coefficient was 0.85, therefore, not statistically significant (Table 9).

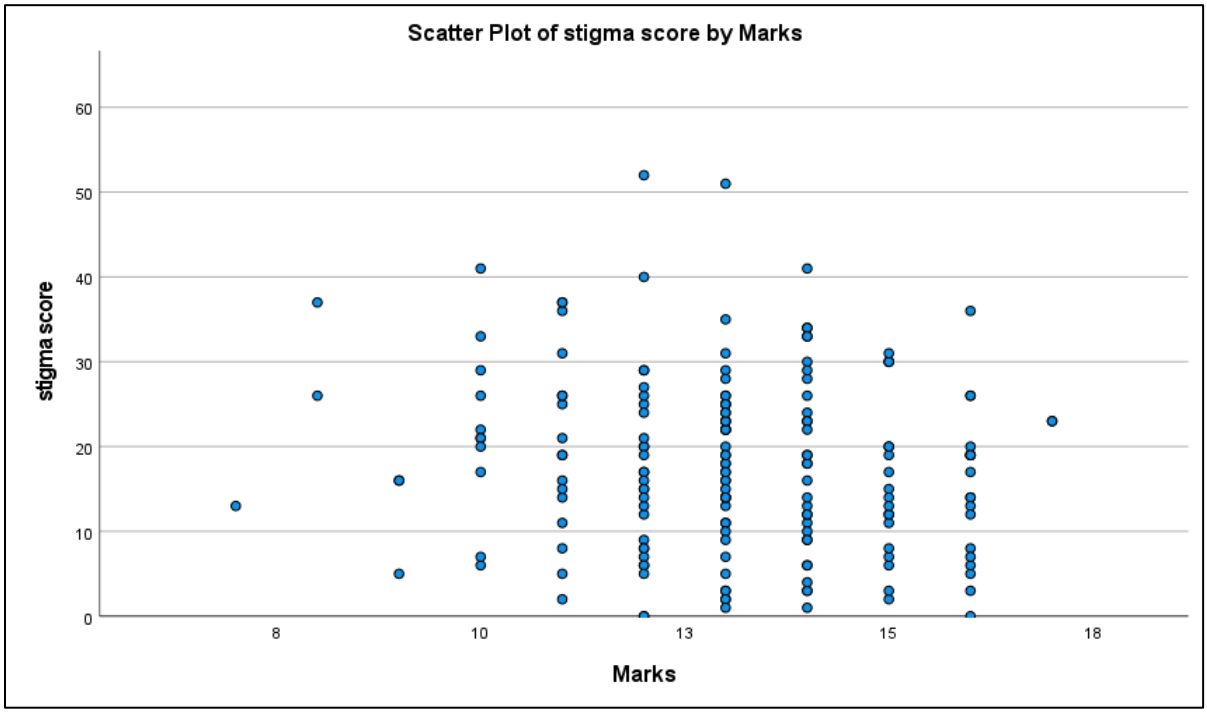

Figure 1: Scatter Plot of Stigma Score by Marks

Figure 1 shows scattered distribution on scatter plot indicates a weak relationship between HIV/AIDS knowledge and HIV stigma score.

Discussion

The results show no improvement in HIV/AIDS knowledge score and HIV stigma score with higher semester students. This could be due to samples collected only from clinical students' semesters 6, 7, 8 and 9 in IMU Seremban campus whereby the majority of them have adequate knowledge and understanding about HIV/AIDS, learned during their preclinical years. These findings highlight the effectiveness of the HIV/AIDS curriculum implemented during the preclinical years at IMU Bukit Jalil campus in equipping students with the necessary knowledge and understanding of HIV/AIDS. Educational programs on HIV/AIDS should not be limited to students from medical universities but also students from non-medical related universities and could even be initiated in secondary schools. A study conducted on students from middle schools and high schools in Wuhan, China, revealed that the knowledge and attitudes of students towards HIV/AIDS significantly improved with interventions such as lectures and educational videos on HIV/AIDS (Gao *et al.*, 2012; Hamid Albujeer, Shamshiri & Taher, 2015).

Based on the Pearson correlation coefficient (r) of -0.129 between the HIV/AIDS knowledge score and the HIV stigma score, it appears that there is a negligible correlation between these two variables. This

suggests that there is little to no linear relationship between participants' knowledge about HIV/AIDS and their perceived level of stigma. Additionally, the *p* value of 0.85 indicates that the correlation coefficient is not statistically significant. This means that the observed correlation between HIV/AIDS knowledge and HIV stigma is likely due to random chance rather than a meaningful relationship between the variables. These findings suggest that possessing greater knowledge about HIV/AIDS does not necessarily translate to reduced stigma perception among individuals. The absence of a significant correlation may indicate that other factors play a more influential role in shaping stigma perception.

The findings in the study have important implications for public health interventions aimed at reducing HIV/AIDS-related stigma. While education and awareness initiatives are crucial for combating stigma, the results suggest that simply increasing knowledge about HIV/AIDS may not be sufficient to reduce stigma. Chan *et al*. (2022) revealed that despite having good HIV knowledge, family medicine trainees still demonstrated stigma and discrimination toward HIV patients. Other factors that were reported as reasons behind HIV-related stigma and discrimination include fear of contracting HIV, personal values, religious thoughts and sociocultural values and norms (Fauk *et al*., 2021b). A study conducted among primary healthcare providers in Kinta District, Perak, found that stigmatising attitudes toward PLWHA were significantly influenced by factors such as knowledge, profession, caregiving experience, gender and having HIV-positive relatives (Chan, binti Mawardi & Ismail, 2021). Li *et al*. (2009) suggests that personal contact with PLWHA can have a significant impact on individuals' attitudes toward this population, leading to more liberal attitudes compared to perceived social norms. Despite prevailing social norms or stigmatising attitudes towards PLWHA in the broader community, IMU clinical students generally have a low stigma against PLWHA. This is because IMU clinical students may have encountered personal interactions with PLWHA that can shape individuals' attitudes in a more positive and accepting direction. Personal interactions may increase compassion, reduce fear and stigma, enhance understanding of the challenges faced by individuals with HIV/AIDS (Mohammadifirouzeh, Oh & Tanner, 2021).

This study had some limitations. The original questionnaire has been extensively modified to be more challenging, to a standard for medical students. Some questions were rephrased but all were made using reliable facts from Amboss. Unfortunately, the variability of the modified questionnaire was lower than expected. Since the HIV/AIDS knowledge questions reliability was unacceptable, the correlation may not generate the expected result. Therefore, to improve the reliability of the questionnaire, a test-retest reliability method can be employed. The questionnaire can be administered again at a different time to assess the consistency of responses over time. Moreover, before the formal administration of the questionnaire, pilot testing can be conducted to refine and validate its content, structure, and clarity. Lastly, social desirability bias may produce a generally low stigma score among medical students.

Conclusion

This study found no improvement in HIV/AIDS knowledge or stigma scores among higher-semester clinical students. The weak correlation between knowledge and stigma perception suggests that increasing knowledge alone may not be enough to reduce HIV-related stigma. Since stigma is often shaped by personal feelings, other factors such as individual experiences, cultural beliefs, and social norms are likely to have a stronger influence. These findings emphasise the need for public health interventions that go beyond conventional education. Effective strategies could include fostering personal interactions with people living with HIV/AIDS (PLWHA), addressing sociocultural influences, and incorporating targeted stigma-reduction programs. A broader approach focusing on empathy, social context, and personal attitudes may lead to greater acceptance and reduced stigma.

Future research should explore HIV/AIDS stigma among non-medical students and younger populations to see if similar trends exist outside medical education. Studies have shown that stigma can be linked to economic status and educational attainment, with higher levels of misinformation in less educated and lower-income groups. Understanding how stigma varies across different backgrounds will help tailor more inclusive interventions. Additionally, variables such as age, work

experience, and marital status should be considered when designing stigma-reduction strategies, especially among healthcare workers. Longitudinal studies would also be valuable to monitor how stigma changes over time and assess the long-term effectiveness of interventions. Promising approaches to stigma reduction include peer-led programs, patient testimonials, community-based training, and involvement of local leaders. Interventions that are sensitive to cultural and religious values can also improve acceptance and promote healthier perspectives within communities. Addressing HIV-related stigma in a holistic and inclusive manner is essential for meaningful public health impact.

Conflict of Interest

The authors declare that there has no conflict of interest.

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