Conflict of Interest Disclosure in Oncology: Preliminary Insights From the Global ONCOTRUST-1 Cross-Sectional Study

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ABSTRACT

PURPOSE Conflicts of interest (COIs) between oncologists and industry might considerably influence how the presentation of the research results is delivered, ultimately affecting clinical decisions and policy-making. Although there are many regulations on reporting COI in high-income countries (HICs), little is known about their reporting in low- and middle-income countries (LMICs). Oncology Transparency Under Scrutiny and Tracking (ONCOTRUST-1) is a pilot global survey to explore the knowledge and perceptions of oncologists regarding COI.

MATERIALS AND METHODS We designed an online 27-question–based survey in the English language to explore the perceptions and knowledge of oncologists regarding COI, with an emphasis on LMICs. Descriptive statistics and the Consensus-Based Checklist for Reporting of Survey Studies guidelines were used to report the findings.

RESULTS ONCOTRUST-1 surveyed 200 oncologists, 70.9% of them practicing in LMICs. Median age of the respondents was 36 (range, 26-84) years; 47.5% of them were women. Of the respondents, 40.5% reported weekly visits by pharmaceutical representatives to their institutions. Regarding oncologists' perceptions of COI that require disclosure, direct financial benefits, such as honoraria, ranked highest (58.5%), followed by gifts from pharmaceutical representatives (50%) and travel grants for attending conferences (44.5%). By contrast, personal or institutional research funding, sample drugs, consulting or advisory board, expert testimony, and food and beverage funded by pharmaceutical industry were less frequently considered as COI. Moreover, only 24% of surveyed oncologists could correctly categorize all situations representing a COI.

CONCLUSION These findings underscore the importance of clear guidelines, education, and transparency in reporting COI in oncology. This hypothesis-generating pilot survey provided the rationale for ONCOTRUST-2 study, which will compare perceptions of COI among oncologists in LMICs and HICs.

ACCOMPANYING CONTENT

Data Supplement

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INTRODUCTION

Historically, pharmaceutical companies have influenced clinical practice, prescriptions volume, and reimbursement policy in the field of oncology through various strategies.[1-3] This includes advertisements, payments to various stakeholders, sample drugs, gifts, and trips to conferences, among other marketing tactics. There are abundant studies that highlighted the prevalence of activities and relationships between the pharmaceutical industry and physicians, noting their significant impact on the adoption of new medical products.[4-7] Remarkably, a global correlation between payments from the industry to physicians and changes in their clinical practices was also noticed, as demonstrated by a recent systematic review.[7] This interaction frequently resulted in a higher volume of prescriptions for the products in question, indicating a direct influence of industry on medical decision making.[7] Although the prevalence and impact of these practices are well documented in high-income countries (HICs), there is a paucity of data from low- and middle-income countries (LMICs), especially in Africa.[3]

CONTEXT

Key Objective

This global survey–based study, Oncology Transparency Under Scrutiny and Tracking (ONCOTRUST-1), examined the knowledge and perceptions of oncologists and cancer researchers about conflict of interest (COI) with the industry, with a focus on low- and middle-income countries (LMICs).

Knowledge Generated

The survey revealed significant engagement between oncologists and the pharmaceutical industry, including visits by representatives and various forms of industry support such as travel grants to conference and sample drugs. Key findings include a high recognition of direct financial benefits such as honoraria and gifts as COI, but less awareness and inconsistent reporting concerning personal or institutional research funding, consulting roles, and other indirect benefits. Notably, only a quarter of respondents could accurately identify all scenarios that constituted a COI.

Relevance

The results from ONCOTRUST-1 underscore the critical need for clearer COI policies, enhanced training, and increased transparency in oncology, particularly in LMICs. The pilot study's findings advocate for the development of standardized reporting mechanisms to improve integrity in clinical decision-making and policy formulation. These insights provide the foundation for the subsequent ONCOTRUST-2 study, which aims to further investigate and compare COI perceptions among oncologists in different economic settings.

The health care system in LMICs is emerging as a new and appealing market for the pharmaceutical industry.[3,8] Although a significant portion of clinical trials and their participants have traditionally originated from HICs,[9] the regulatory and research environment for oncology studies in LMICs has recently experienced significant developments, making it more favorable to drug development.[10] However, this has also brought to light a significant dilemma regarding the conduct and outcomes of research performed in these regions. In addition, this has undoubtedly enhanced the percentage of physicians in LMICs interacting with pharmaceutical companies.[8] There is also evidence indicating that offering expensive personal gifts and cash payments to doctors is becoming more frequent in LMICs.[3,8] In LMICs, such as in sub-Saharan Africa, where oncologists earn substantially lower salaries compared with their counterparts in HICs, maintaining sustainably the continuous medical education (CME) presents a substantial challenge.[3] Consequently, financial incentives from the pharmaceutical industry, including travel grants to conferences and other forms of support, often become the preferred solution for oncologists in LMICs. This situation increases the risk of potential conflicts of interest (COIs) in LMICs compared with HICs. Collectively, these factors together may make the oncologists-industry interactions more condensed in these regions, representing often emerging markets for several competing companies to promote their own products. Although these complex relationships might be beneficial for some settings, they also raise concerns about the ethics and integrity of clinical research and practice in LMICs.

In this context, the Oncology Transparency Under Scrutiny and Tracking (ONCOTRUST-1) was developed as a hypothesis-generating pilot global survey to explore the knowledge and perceptions of oncologists regarding COI, with a focus on LMICs.

MATERIALS AND METHODS

Survey Design

A cross-sectional, survey-type study targeting practicing oncologists from different specialties was developed on Microsoft Forms consisting of 27 items in English (Data Supplement, Appendix S1). The questionnaire involved three sections. The first part covered the demographic characteristics of participants and use of evidence-based medicine (EBM) in practice (questions 2-12), the second part focused on their interactions with pharmaceutical industry (questions 13-22), and the third part addressed potential measures to improve the reporting of COI (questions 23-28). These three themes were developed on the basis of a combination of both open-ended, multiple-choice, and Likert scale questions after a review of the literature to find research gaps on COI reporting in LMICs[3,11] and on the basis of definitions from ASCO.

These themes were subsequently structured with emphasis on specificity, neutrality, and clarity to avoid difficult concepts. A number of questions were designed with multiple-choice options to limit acquiescence bias, and it was preplanned to be converted into binary outcomes during data analysis, as previously described.[12] An open answer option was added to some questions to limit the effect of answer order bias by capturing further participants' perspectives. An internal critical review of the survey content and design was

conducted in the initial testing phase to identify potential issues or challenges emerging from the responders. In this phase, no changes in the survey were required. All co-authors discussed the draft questionnaire to address any inconsistencies before its online release and distribution. Feedback from the pretesting was used to refine the survey to ensure clarity, relevance, and comprehensiveness.

Eligibility criteria included oncologists who had been in practice or in research for at least 1 year. The pilot online survey was left open for inclusion for 1 month from January 1, 2024, to January 30, 2024. The distribution of the survey was performed through multiple secured networks of oncology experts, primarily approaching the health professionals through the closed social media channels and mailing list of ONCOLLEGE and associated networks, using snowball sampling methods, on the basis of previous survey experiences from our same research team.[13,14] Measures were adopted to guarantee a diverse representation of oncologists from LMICs and HICs. No incentives were offered to encourage participant responses. To prevent multiple submissions from the same individual, the survey platform was configured to allow only one response per user.

Data Handling, Ethical Approval, and Informed Consent

Data handling adhered to the European Union General Data Protection Regulation (GDPR 2016/679) to maintain privacy, with outcomes aggregated to prevent revealing participants' identities. The study received a waiver from the need for ethical committee clearance, classified as minimal risk by an ethics board review (ref: IRB00012973—Research Ethics Committee of the Polydisciplinary Faculty of Taroudant, Morocco). The survey started with an introductory letter, outlining the terms under which the authors consent to the use of their responses for research purposes, including the expected dissemination of findings. Moreover, surveyees were informed about the study's objectives, the voluntary nature of their participation, and the confidentiality of their responses. Participation was subject to respondents' affirmative electronic consent, and information was collected ensuring total anonymity and privacy. The survey did not permit missing data, and all the respondents were required to answer all the questions before the survey completion. Options such as "prefer not to say" and "don't know" were included, to avoid forcing answers. Where responses were deemed unclear at the time of the analysis, null values applied. This substitution was accompanied by comprehensive documentation in summary tables to maintain scientific transparency. The manuscript writing and reporting adhered to the guidelines outlined in the Consensus-Based Checklist for Reporting of Survey Studies.[15]

Data Analysis

Excel (Microsoft Office) and IBM SPSS Statistics 25 (SPSS, Chicago, IL) were used for data extraction, coding, and analysis. For this hypothesis-generating pilot survey, descriptive statistics were used to report categorical and quantitative data as appropriate. Data were analyzed on the basis of the two World Bank economy groups (2022 data[16]): HICs and LMICs.

RESULTS

Demographic Characteristics and General Features of Survey Participants

Because of space constraints in the journal, the demographic characteristics and general features of 200 surveyed oncologists are summarized in the Data Supplement (Appendix S2).

Experience, Source of Continuous Education, and Confidence of Practicing EBM in Daily Practice of Participants

The experience of surveyed participants in practice is summarized in the Data Supplement (Appendix S2), given the space limitation in the journal.

Perception of Participants on COIs and Their Interactions With Pharmaceutical Industry

The survey results showed various scenarios considered as COI that require disclosure (Table 1). A significant portion of participants (82.5%) did not view receiving sample drugs as a COI requiring disclosure, whereas 50% of surveyed oncologists considered gifts from pharmaceutical representatives as COI. Similarly, trips to conferences, or free accommodation and travel grants from pharmaceutical companies were considered COI by 44.5% and 44% of respondents, respectively. Personal research funding was seen as a COI by 40%, while institutional funding was less frequently viewed as such (22%). Direct payments, such as honoraria, was considered COI that need to be disclosed by the majority of participants (58.5%). Thirty-seven percent of respondents considered consulting or advisory roles as COI. Expert testimony, and food and beverages paid by the pharmaceutical industry were seen as COI by 19.5% and 32.5% of respondents, respectively. Interestingly, only 24% of participants indicated that all the listed items were considered COI (Fig 1).

Regarding the frequency of pharmaceutical industry visits to cancer care facilities of surveyed oncologists, 40.5% of the participants reported weekly visits, followed by 24% reporting monthly visits. The types of support received from the pharmaceutical industry in the past 5 years showed that 51.5% had been offered trips to conferences, 20.5% had received sample drugs, and 9% received gifts. And 23.5% stated they had not received any form of support. Concerning honorariums received from the pharmaceutical industry, there was varied landscapes of financial interactions (Table 1) but the majority of respondents (66%) reported not having received any form of direct payment. Additionally, 12.5% of the participants preferred not to declare the amount

TABLE 1. Perception of Participants on COIs and Their Interactions With Pharmaceutical Industry

Survey Item/Variable	No. (%)
Frequency of pharmaceutical industry visits to cancer care facilities	
Daily	14 (7)
Weekly	81 (40.5)
Monthly	48 (24)
Occasionally	37 (18.5)
Rarely	11 (5.5)
Never	9 (4.5)
Types of support received from the pharmaceutical industry (past 5 years)[a]	
Sample drugs	41 (20.5)
Trips to conferences	103 (51.5)
I have not received any support	47 (23.5)
I prefer not to declare	20 (10)
Gifts	18 (9)
Other	19 (9.5)
Amount of honorarium (direct payment) received from pharmaceutical industry	
<$500 USD	13 (6.5)
$500-$1,000 USD	6 (3)
$1,000-$2,000 USD	11 (5.5)
$2,000-$5,000 USD	7 (3.5)
>$5,000 USD	5 (2.5)
I prefer not to declare	25 (12.5)
I have not received any amount of money	132 (66)
Missing data	1 (0.5)
Pressure from pharmaceutical industry to support the prescriptions of their drugs when having COIs with them	
Yes	22 (11)
No	145 (72.5)
Not sure	33 (16.5)
Influence of prescriptions and treatment recommendations during multidisciplinary team meetings when being a speaker in industry-sponsored events	
Yes	20 (10)
No	150 (75)
Not sure	30 (15)
Objective appraisal of clinical trials when having COIs with pharmaceutical industry	
Yes	120 (60)
No	33 (16.5)
Not sure	47 (23.5)
Decline or remodulation to use a recommendation from an international oncology society because of COIs with industry	
Yes	22 (11)
No	148 (74)
Not sure	30 (15)
Acceptance to get involved with pharmaceutical industry regarding a new drug when the evidence from their related clinical trials is weak or clinically irrelevant	
Yes	17 (8.5)
No	148 (74)
Not sure	35 (17.5)
Oncologists' approaches to disclosing COIs[a]	
I don't report my COIs	30 (15)
I report them before starting lectures	118 (59)
I acknowledge them when publishing research	60 (30)
I prefer not to answer	28 (14)
I don't have any COIs	5 (2.5)

Abbreviations: COIs, conflicts of interest; USD, US dollars.
[a]Binary outcomes retrieved from multiple choice questionnaire.

they received. The pressure to support the prescription of drugs from companies with which participants had COI was reported by 11%, while 72.5% did not feel pressured and 16.5% were unsure. The influence of being a speaker at industry-sponsored events on prescription behavior and treatment recommendations during multidisciplinary team meetings was acknowledged by 10% of the participants, with 75% reporting no influence. When it came to objectively appraising clinical trials in the context of COI with the pharmaceutical industry, 60% of the respondents believed they could still do so, while 16.5% disagreed and 23.5% were unsure. Additionally, 11% of participants admitted to declining or remodulating the use of a recommendation from an international oncology society because of their COI. Finally, the willingness to get involved with the pharmaceutical industry regarding a new drug, when the evidence from related clinical trials was weak or clinically irrelevant, was admitted by 8.5% of the respondents, while 74% were not willing and 17.5% remained unsure. Most of the participants (59%) reported disclosure of their COI before starting lectures, while 30% acknowledged them when publishing research. Conversely, 15% of the respondents admitted they do not report their COI at all. Another 14% chose not to answer the question, indicating a possible sensitivity or reluctance about the topic. A subgroup analysis focusing only on survey participants from LMICs also confirmed these findings, suggesting that the patterns are reproducible across the income areas (Data Supplement, Appendix S3).

Motivation Regarding Engagements With Pharmaceutical Industry and Strategies to Improve Transparency and Regulation

The motivations behind oncologists' engagements with the pharmaceutical industry and their perspectives on managing COI are summarized in Table 2. This survey section revealed that 35.5% of participants reported the existence of local regulations or policies in their home countries designed to manage COI with the pharmaceutical industry. However, a significant proportion of respondents were either unaware of such policies (33%) or confirmed their absence (31.5%). To

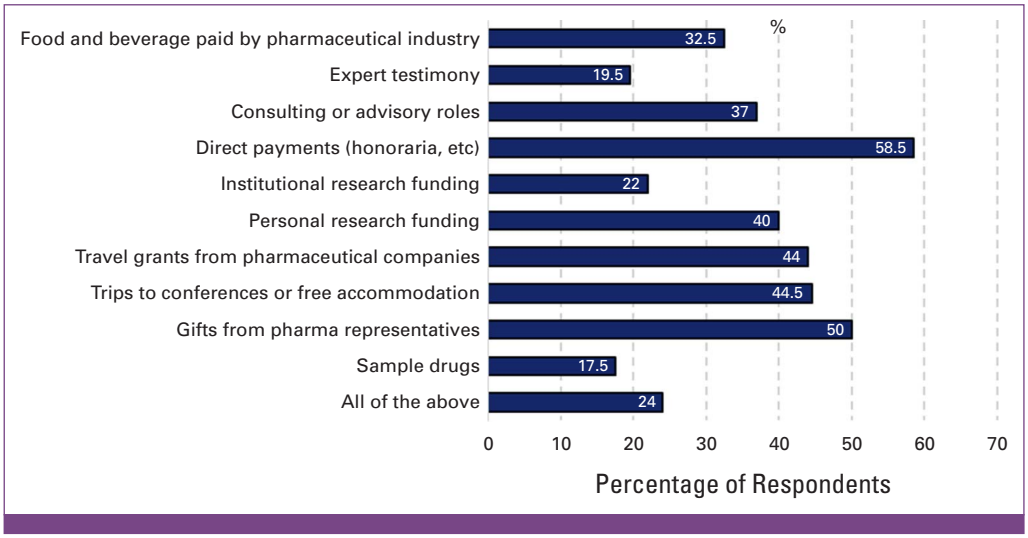

FIG 1. Cases that constitute conflicts of interest according to participants.

enhance COI reporting in oncology, the participants suggested several measures. The most favored proposals were the establishment of an open COI database (55%) and clear policies and local regulations (65%). Furthermore, 63.5% advocated for regular training and education, underscoring the need for continuous professional development in ethical practices. Patient and public involvement was also supported by 31% of respondents for better transparency.

TABLE 2. Local Regulations, Motivations of Engagements With Pharmaceutical Companies, and Strategies to Manage COIs

Survey Item/Variable	No. (%)
Local regulations or policies in home country of participants to manage COIs with pharmaceutical industry	
Yes	71 (35.5)
No	63 (31.5)
I don't know	66 (33)
Participants' proposed improvements for COI reporting in oncology[a]	
Open COI database	110 (55)
Patient and public involvement	62 (31)
Regular training and education	127 (63.5)
Clear policy and local regulations	130 (65)
Reasons for not reporting COIs by oncologists[a]	
Lack of awareness	110 (55)
Complex relationships with pharmaceutical industry	101 (50.5)
Fear of losing financial incentives	75 (37.5)
Fear of negative impact on credibility or reputation	88 (44)
Lack of policy in home countries of practice	112 (56)
Minimizing impact of conflicts in oncology in practice	39 (19.5)
Do you think that income of oncologists is an important factor of having these relationships with pharmaceutical industry?	
Strongly agree	37 (18.5)
Agree	73 (36.5)
Neutral	57 (28.5)
Disagree	23 (11.5)
Strongly disagree	10 (5)

Abbreviation: COI, conflict of interest.
[a]Binary outcomes retrieved from multiple choice questionnaire.

The reasons for not reporting COI suggested by surveyed oncologists were diverse. A majority cited a lack of awareness (55%) and complex relationships with the pharmaceutical industry (50.5%) as primary factors. Concerns over losing financial incentives (37.5%) and negative impacts on credibility or reputation (44%) were also important. Interestingly, 56% of participants identified the absence of policies in their home countries as a critical barrier for implementing improved transparency and regulation. Regarding the influence of income on the establishment of relationships with the pharmaceutical industry, opinions were varied. A majority of respondents (55%) strongly agreed or agreed that income is an important factor, whereas 45% were neutral, disagreed, or strongly disagreed. The majority of participants agreed with various statements on strategies to manage COI (Fig 2). A subgroup analysis focusing only on survey participants from LMICs also confirmed these results (Data Supplement, Appendix S3).

DISCUSSION

In our study, we aimed to examine industry-oncologist interactions and identify associated factors. Our goal was to establish a rationale for recommendations and educational interventions to increase global awareness on this issue. Most importantly, our findings may help formulate hypotheses for ONCOTRUST-2, which will compare these interactions between LMICs and HICs.

ONCOTRUST-1 provided important insights that need to be discussed with the global oncology community. First, the representation of oncologists mainly from LMICs (70%)

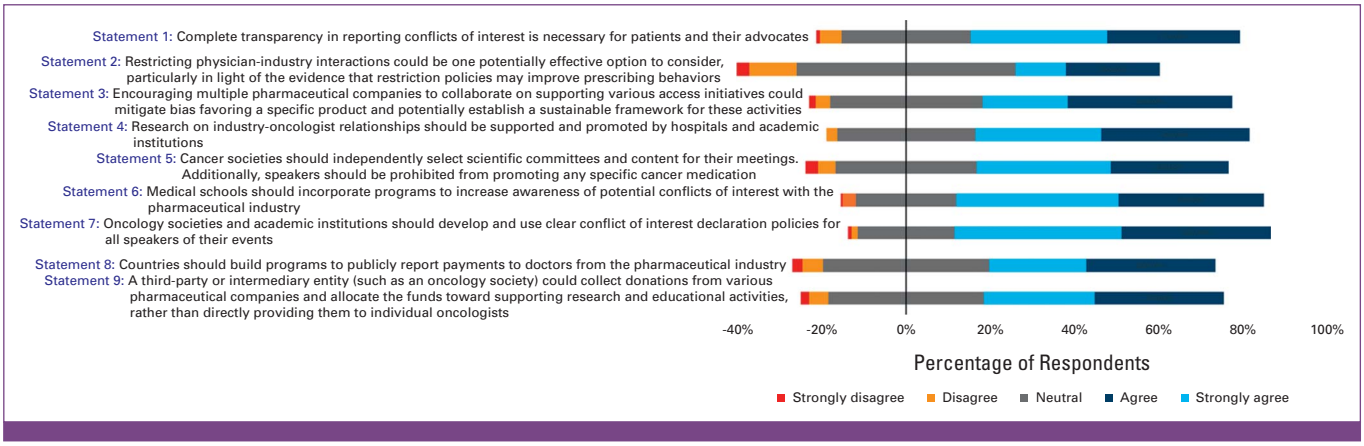

FIG 2. Participants' agreement with statements on strategies to manage conflicts of interest.

presented a context for understanding the perceptions and practices regarding COI. Indeed, few studies have historically investigated COI in these regions,[8] mainly in nononcologic specialties. In the past decade, there has been significant progress in industry-sponsored cancer drug developments, which has notably improved patient outcomes. Although these advances have predominantly occurred in HICs, LMICs are increasingly becoming attractive to pharmaceutical companies as well. This interest is driven by the evolving economic landscape of these countries, the global growth ambitions of these companies, and the unmet need for real-world data to inform further developments. Promoted by various factors mentioned earlier (and elsewhere, see the study by Rubagumya et al[3]), as well as the fact that the regulatory and policy environment in these regions is fragile and not yet mature enough to enforce transparent reporting of COI, relationships between the industry and oncologists may be intensified. Indeed, this was confirmed by our survey results. About 40% of respondents reported frequent weekly visits of industry representatives to cancer care facilities. The surveyed oncologists relied on international society guidelines, medical websites and other online resources (eg, UptoDate, OncoAlert, and MedScape, etc), and major oncology conferences as their main source of CME. In fact, lack of specific education in the critical appraisal to clinical trial data needed to objectively approach industry-sponsored clinical trials could potentially increase the misperception of benefit from all new drugs and enhance the career attitude toward COI. In general, when much of the oncology education is dominated by the private sector with dedicated events intended to be CME, sponsored for specific products, it results that the overall narrative around specific drugs may be biased toward benefit, versus no significant added therapeutic benefit. Moreover, over-reliance on medical websites, international society guidelines, and major oncology conferences as primary sources of CME can be problematic as these platforms may be sponsored or influenced by pharmaceutical companies.[17-23]

Regarding perceptions of oncologists on what constitutes COI, the majority of respondents did not consider receiving sample drugs to be a COI requiring disclosure. Additionally, there were varied perceptions regarding COI, indicating that not all mentioned scenarios were recognized as potential COI by oncologists, although these cases are generally considered COI worldwide. Only direct payments from the industry to oncologists and gifts were viewed as COI by nearly half of the participants. Unexpectedly, only a small percentage of oncologists (24%) considered all presented scenarios to be COI. This variation in perceptions may stem from a lack of awareness about unified definitions of COI among physicians and health researchers worldwide.[24] The absence of comprehensive training and inconsistent policies across institutions and countries could also contribute to the heterogeneity and variability in understanding COI across different health care systems and cultural contexts. Thus, standardizing COI definitions and ensuring they are culturally and contextually relevant could help reduce these disparities. Additionally, failing to recognize certain activities widely considered as COI can lead to ethical and integrity issues.[25-27] Implementing clear guidelines and robust disclosure mechanisms could mitigate these risks. The relationships between oncologists and pharmaceutical companies, particularly in attitudes toward sample drugs, further underscore the complexity of these perceptions.[3] Barriers to reporting COI related to concerns over losing financial incentives by oncologists further underscore the challenges in establishing a culture of transparency in these settings, as indicated by the results of our survey. This is further supported by the responses from a group of respondents who fail to consistently disclose COI in their professional activities, including presentations and research publications. A noteworthy finding from our survey is that the income of oncologists may be a crucial factor encouraging them to accept support from pharmaceutical companies. This is supported by a majority of respondents who agreed that the income of oncologists plays a significant role, in line with previous observations of pivotal works in this field.[3] Further to this, the lack of awareness among oncologists regarding existing policies and regulations on COI disclosure in their home countries may also contribute to this behavior. For example, in Morocco, there is no clear

policy on COI with the pharmaceutical industry, which contrasts with countries such as the United States and France where more established guidelines and regulations are in place.[28] This lack of a formal framework in Morocco could lead to less transparency compared with regions with more structured approaches to COI management. The lack of established national norms to handle industry-related COI is common in LMICs, as this phenomenon is relatively new and separated from the management of the broader corruption in health care, for which stronger regulations exist.

Alarmingly, the acknowledgment of feeling pressured to prescribe specific drugs because of COI by some respondents underline the potential impact of these interactions on patient care and treatments. In their systematic review of 49 included studies, Fickweiler et al[4] demonstrated that physician-pharmaceutical industry interactions contributed to irrational prescribing of the company's drugs. There is also evidence suggesting that these interactions may be more harmful when oncologists receive direct payments from industry. In fact, this was shown in a recent cohort study that found that industry payments were associated with prescriptions of non-recommended and low-value anticancer drugs.[29] This raises serious concerns regarding oncologist's integrity in practice, and thus, the urgent need to build actionable policy by health care authorities for surveillance actions. In our survey, a small group of respondents reported that they declined or remodulated guidelines from an international oncology society because of their COI with the industry. It is hypothesized that additional participants may have had the same response but did not disclose it.

Complex industry-oncologist relationships can be advantageous in certain contexts. One can argue that capacity building in LMICs cannot be achieved without industry support through fellowships, sponsorship to attend meetings of oncology societies, and research grants, particularly given the shortage of funding sources available to oncologists in these regions.[3] Our survey findings also highlighted these educational opportunities provided by pharmaceutical companies to attend conferences for CME. However, collective engagement of oncologists to develop an ethical framework of these interactions in LMICs is urgently needed.[3] In this perspective, various short-term solutions and suggestions were made by expert panels from sub-Saharan Africa on how to mitigate the risks of industry-oncologist interactions.[3] This encompasses (1) integrating courses on COI during early and postgraduate trainings in medical schools, (2) developing research projects to understand industry-oncologist interactions, (3) ensuring that content of oncology meetings is selected by independent committees and prohibiting promotion of specific drugs by oncologists, (4) adopting and implementing clear COI policies, such as open payments databases, and (5) using a third-party intermediary to collect pharmaceutical donations for CME and research.

Our study has various strengths and also a number of limitations. To our knowledge, this is the first survey to explore perceptions and interactions of oncologists with pharmaceutical industry in LMICs, where data on COI are generally scarce. This may provide the rationale to build regulatory frameworks and targeted educational programs as well as advocacy efforts for enhanced transparency. Promisingly, ONCOTRUST-1 also provided the foundation for ONCOTRUST-2, which will be methodologically improved and powered to compare these interactions between LMICs and HICs. Regarding limitations, our cross-sectional survey was a pilot study that collected data in a short period of time and had limited geographic representation in terms of respondents. In addition, the reliance on English as a language of the survey may also cause barriers to non–English-speaking oncologists, which may potentially skew our data and not fully capture diversity of practices. Because of the sensitive nature of this topic, self-reported data may be underreported and overestimated. The lack of qualitative insights that could explain some participants' responses is also a limitation of our findings. Therefore, careful interpretation of these results is essential. Nevertheless, this will be addressed by improving the survey design of ONCOTRUST-2.

In conclusion, the ONCOTRUST-1 study findings serve as a pivotal step toward understanding and addressing the challenges posed by COI in oncology in LMICs. There is a significant gap in the awareness and management of COI among oncologists, especially in LMICs. Although most respondents recognize direct financial benefits as COI, there is less agreement on other forms such as sample drugs. Few oncologists could correctly identify all COI scenarios despite frequent doctor-industry interactions. Accordingly, advancing the dialogue on COI in oncology will be essential for a better use of available evidence and ethical standards when manipulating anticancer drugs. Lessons from this pilot study should inform future efforts to develop guidelines adapted to LMICs on how to promote COI reporting and advocate for awareness among health professionals and authorities in these settings. The problem with COI in oncology is that the relationship between cancer physicians and industry is too complex to be investigated accurately in one survey. Thus, more research on this issue of practice integrity is awaited.

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DATA SHARING STATEMENT

The data set of this research is available upon reasonable requests.

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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Open Payments is a public database containing information reported by companies about payments made to US-licensed physicians (Open Payments).

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