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Sensitivity of Self-reported Opium Use in Cancer Patients: Implications for conducting epidemiological studies

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ABSTRACT

Background: Underreporting bias related to opium use is a significant methodological issue that can threaten the results of epidemiologic studies, particularly when opium use is the exposure of interest. In our current study, we aimed to measure the sensitivity of opium use. among cancer patients and identify the contributing factors

Method: In a cross-sectional study, we examined the sensitivity of self-reported opium use among cancer cases. In this study, we avoided using urine tests as the gold standard to prevent false positive results, given that most cancer patients use opioids to alleviate their pain. Instead, we relied on their reports of use to anesthesiologists as the gold standard and compared it with their reports to interviewers to calculate sensitivity

Results: The sensitivity of self-reported opium use among cancer patients was approximately 63.33% (95% CI: 43.86% – 80.07%). Interestingly, this sensitivity was significantly higher among cigarette users 88.24% (95% CI: 63.56% – 98.54%) compared to non-users 30.77% (95% CI: 9.09% – 61.43%). Additionally, the sensitivity of self-reported opium use was higher among alcohol users and participants with low socioeconomic status compared to their counterparts, although these differences were not statistically significant.

Conclusion: The observed sensitivity of self-reported opium use among cancer patients underscores the importance of meticulous and comprehensive approaches for collecting and interpreting self-reported substance use data. Researchers and policymakers should consider contributing factors to the sensitivity of self-reported opium use.

Keywords: Self-reported, Sensitivity, Opium, Cancer

INTRODUCTION:

Keeping and consuming opium is illegal in Iran (1). Often opium use is a self-reported variable in epidemiologic studies. On the other hand, self-reported opium use can be influenced by underreporting bias, leading to lower prevalence estimates compared to urine tests (2). A urine test is a common method of screening for opioids. Signs of opioid use can remain in the body of the person long after the physical effects wear off. The test can detect consumption of opioids in the past 72 hours (3)

Knowing the sensitivity of self-report opium use will help us in the interpretation of results. Some studies investigated the sensitivity of self-reporting opium use in Iran by using urine tests as the gold standard. The sensitivity of self-reported opium use can vary depending on the study population and the context. A study compared self-reported substance use between a research setting and a primary health care (PHC) setting in Iran and reported that sensitivity values for self-reported opium use were 39.4% and 50%, in research and PHC settings respectively and setting (Research vs. PHC) did not significantly affect self-reported substance use estimates (2). Another study reported that the sensitivity of self-reported opium use was 93% (4), while another study reported a sensitivity of 24.7% (5). In summary, self-reported opium use can be influenced by various factors, and its sensitivity may vary. Researchers need to consider these limitations when estimating substance use prevalence based on self-reports.

While the extent of self-reported bias varies based on the study population and cannot be universally applied, researchers often rely on self-reported information in epidemiological studies. This approach helps save time, reduces costs, optimizes resources, and facilitates the collection of necessary data. Despite recent advancements in biological assays for detecting substance use, self-reported data remains a valuable tool in research (5, 6).

In a multicenter case-control study, we investigated the association between opium use and cancer risk. To select suitable controls with less underreporting bias and greater similarity to the general population, a validation study compared the sensitivity of self-reported opium use between healthy visitor controls and hospitalized patients and it was approximately 70 percent (6), but the sensitivity of self-reported opium use among cancer cases remains unknown (6). Although studies have shown that cases recall their past exposure better than controls (7), when the exposure of interest is a sensitive issue like opium use, it appears that underreporting bias could be a methodological concern. There may be non-differential misclassification due to underreporting bias in both cases and controls.

Most cancer patients turn to opioids—such as oxycodone, hydrocodone, morphine, methadone, and pethidine—to alleviate their pain (8). These opioids can lead to positive urine test results. Given this context, relying solely on urine samples as a standard criterion to assess the sensitivity of self-reported opium use among cancer patients may not be appropriate. The consumption of these substances can potentially yield false positive results.

In the context of medical practice, anesthesiologists routinely inquire about patients' history of using narcotic drugs, including substances like opium. This crucial information serves two primary purposes: preventing sudden withdrawal symptoms and avoiding drug-anesthetic interactions (9). Urine tests, while commonly used, have limitations. To address this, we propose considering the clinicians' responses at the surgery room as a more reliable standard measure for assessing the sensitivity of self-reported opium use. Additionally, we aim to explore how various factors impact the sensitivity of self-reported opium use among cancer patients.

Materials and Methods:

A total of 108 cancer cases referred to the Cancer Institute, who were candidates for surgery, were recruited between May 2019 and September 2019. A trained interviewer interviewed participants before their surgery. Data on demographic characteristics and substance use history were collected during these interviews. Subsequently, the information gathered at this stage about opium

consumption was compared with the information collected by an anesthesiologist before surgery. This comparison allowed us to calculate the sensitivity of the information on self-reported consumption of crude opium and its derivatives including Shireh, Sukhteh, Heroin, and Morphine (10)

Exposure assessment:

In the current study, we used a questionnaire that covered a comprehensive set of questions related to opioid use (Opium, Shireh, Sukhteh, Heroin, and Morphine and other relevant factors including age, gender, socioeconomic status (SES), cigarette and tobacco smoking, and alcohol consumption (6). To mitigate the limitations associated with urine tests, we adopted the response provided by clinicians as the gold-standard measure for assessing the sensitivity of self-reported opium use.

Sample size:

We used the sample size calculation formula of diagnostic test studies to estimate the sample size needed for this study. The sensitivity and specificity of the questionnaire in detecting opium users were considered to be 80 and 100%, respectively. Assuming a sensitivity of 95% and statistical power of 90%, approximately 120 individuals were needed to conduct this study.

Statistical analysis:

We conducted descriptive analyses using means and proportions for quantitative and qualitative variables, respectively. Additionally, we employed chi-squared and t-tests for analytical purposes, utilizing Stata software.

Results:

We included 108 cancer patients who participated in the IROPICAN study. The majority of participants (98.15%) were male, and they fell within the 60-69 years age group (28.7%). Approximately 30% of the participants were cigarette smokers, while 17.59% reported opium use, and 18.52% were alcohol users (Table 1).

The sensitivity of self-reported opium use was 63.33% (95% CI: 43.86%, 80.07%). Cigarette smokers exhibited significantly higher sensitivity (Sen=88.24%, 95% CI: 63.56%, 98.54%) than non-smokers (Sen=30.77%, 95% CI: 9.09%, 61.43%). Regular alcohol users had a sensitivity of about 77% (95% CI: 46.19% – 94.96%), while it was %53 (95% CI: 27.81% – 77.02%) among those who did not regularly drink alcohol (Table 2). but the difference was not significant.

Interestingly, the sensitivity was higher in the low SES group (71.43%, 95% CI: 41.90% – 91.61%) than in the high SES group (Sen=50%, 95% CI: 15.70%, 84.30%). However, this difference was not statistically significant (Table 2). The sensitivity remained consistent across different age groups, standing above 60%. Although it was lower in the age 40-49 (Sen=50%, 95% CI: 6.76%, 93.44%), the difference was not statistically significant compared to the reference group (P value=0.36)

Discussion:

We found that the sensitivity of self-reported opium use was significantly higher among cigarette smokers than non-smokers. Additionally, it was elevated in individuals with lower SES and alcohol users, although this difference was not statistically significant.

In our study, the sensitivity of self-reported opium use was found to be about 64 percent, which is lower than the values reported in other studies (24.7% and 93%). Researchers have suggested that sociocultural factors can have a significant impact on drug use reporting, as consumption patterns, legal restrictions, and social stigma all play a role (2, 11). For example, in a validation study conducted in the Golestan cohort, the sensitivity of self-reported opium use was 93%, possibly due to the cultural acceptance of opium use in that region (4). Opium is widely used as a traditional medicine in rural areas of Golestan and among the Turkmen population in this part of Iran. However, the sensitivity of self-reported opium use was found to be very low in the Azar cohort (5), located in the northwest of Iran, where opium use is not socially accepted (5). Although opium use in cancer patients is often considered a traditional medicine and

Table 1. Demographic characteristics and behavioral habits of the participants

Variable	Frequency (%)
Total	108
Gender	
Female	2 (1.85)
Male	106 (98.15)
Age group	
30-39	19 (17.59)
40-49	15 (13.89)
50-59	15 (13.89)
60-69	31 (28.7)
≥76	28 (25.93)
Socioeconomic status	
Low	37 (34.26)
Medium	34 (31.48)
High	37 (34.26)
Cigarette smoking	
No	76 (70.37)
Yes	32 (29.63)
Opium use	
No	89 (82.41)
Yes	19 (17.59)
Alcohol use	
No	88 (81.48)
Yes	20 (18.52)

pain relief drug, this does not fully explain the lower sensitivity observed in our study. It is expected that there would be minimal social pressure to deny opium use. However, the participants' responses to drug use are influenced by various factors, including social stigma, public opinion, and legal prohibition. These factors may contribute to the denial of drug use among study participants (12).

The self-reported opium use was more prevalent among alcohol users compared to non-users. However, this observed difference did not reach statistical significance. The presence of social stigma related to both alcohol and opium use, along with legal restrictions, might contribute to individuals being hesitant to disclose their consumption of these illicit substances (5, 13). It seems that those who were reluctant to report their alcohol use were less prone to underreport their opium use. The sensitivity of self-reported opium use was significantly higher among cigarette smokers compared to non-smokers. Notably, in Iran, where cigarettes are not legally prohibited and there is a minimal social stigma, these findings align with the research conducted by Khalili, Shakeri, and Pourshams (2, 14, 15). Consequently, individuals who smoke cigarettes may feel less embarrassed than others when reporting their opiate use (2, 16).

The validity of self-reported opium use indeed varies across different populations and settings. Typically, young people (aged 18-25) are anticipated to report less illegal behavior due to social stigma. However, in our study, the sensitivity of self-reporting remained consistent across age groups. Surprisingly, these findings contradict the

Table 2. Sensitivity of self-reported opium use by age, gender, SES, smoking status, and alcohol use

Variable	Sensitivity (95%CI)	P-value
Total	63.33 (43.86 – 80.07)	
Age		
30-39	66.67 (9.43 – 99.16)	Reference
40-49	50.0 (6.76 – 93.44)	0.36
50-59	66.67 (22.28 – 95.67)	1
60-69	66.67 (34.89 – 90.08)	1
≥76	60.0 (14.66 – 94.73)	0.43
Gender		
Female	100.0 (2.50 – 100)	-
Male	62.07 (42.26 – 79.31)	
Socioeconomic status		
Low	71.43 (41.90 – 91.61)	Reference
Medium	62.50 (24.49 – 91.48)	0.28
High	50.00 (15.70 – 84.30)	0.16
Ciggarte use		
No	30.77 (9.09 – 61.43)	Reference
Yes	88.24 (63.56 – 98.54)	0.007
Alcohol use		
No	52.94 (27.81 – 77.02)	Reference
Yes	76.92 (46.19 – 94.96)	0.13

results observed in other studies (17, 18). Our study findings indicate that the sensitivity of self-reported opium use was higher among individuals with low SES, indicating that that socioeconomic factors play a significant role in how individuals report their opium use (5).

To the best of our understanding, this study represents the initial report on the sensitivity of opium use among cancer patients, along with the factors contributing to it. In this investigation, for the first time, we employed patients' reports of opium use to anesthesiologists as the gold standard to mitigate the likelihood of false positive results arising from analgesic drug use in cancer patients. Anesthesiologists routinely gather information about patients' use of narcotic drugs, including substances like opium. This critical data serves two primary purposes: preventing sudden withdrawal symptoms and avoiding drug-anesthetic interactions (9). This study had some limitations, as we did not have enough sample size to see the effect of gender on underreporting bias, larger and more comprehensive studies are needed to see the effect of different factors on opium underreporting bias.

Conclusions:

The low sensitivity of self-reported opium use in our study showed that cancer patients tended to underreport their opium use as well as healthy controls. In summary, these findings underscore the need for detailed and thoughtful approaches when collecting and interpreting self-reported substance use data. Researchers and policymakers should consider factors such as cigarette

smoking, socioeconomic status, and age when designing surveys or evaluating opium-related interventions. These findings highlight the complex interplay of various factors in self-reported opium use and underscore the need for further research in this area. It also helps adjust for potential misclassification bias in future epidemiological studies and reports true associations between opium use and cancer risks.

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References:

1. Mohebbi E, Rashidian H, Tahami AN, Haghdoost AA, Rahimi-Movaghar A, Seyyedsalehi MS, et al. Opium use reporting error in case-control studies: neighborhood controls versus hospital visitor controls. Medical Journal of the Islamic Republic of Iran. 2021;35:60.
2. Khalili P, Nadimi AE, Baradaran HR, Janani L, Rahimi-Movaghar A, Rajabi Z, et al. Validity of self-reported substance use: research setting versus primary health care setting. Substance abuse treatment, prevention, and policy. 2021;16(1):1-13.
3. Berlan ED, Bravender T. Adolescent Medicine Today: A Guide to Caring for the Adolescent Patient: World Scientific; 2012.
4. Abnet CC, Saadatian-Elahi M, Pourshams A, Boffetta P, Feizzadeh A, Brennan P, et al. Reliability and validity of opiate use self-report in a population at high risk for esophageal cancer in Golestan, Iran. Cancer Epidemiology Biomarkers & Prevention. 2004;13(6):1068-70.
5. Ashrafi S, Aminisani N, Soltani S, Sarbakhsh P, Shamshirgaran SM, Rashidi M-R. The validity of self-reported drug use with urine test: results from the pilot phase of Azar cohort study. Health promotion perspectives. 2018;8(3):225.
6. Rashidian H, Hadji M, Marzban M, Gholipour M, Rahimi-Movaghar A, Kamangar F, et al. Correction: Sensitivity of self-reported opioid use in case-control studies: Healthy individuals versus hospitalized patients. Plos one. 2018;13(2):e0192814.
7. Johansen C, Schüz J, Andreasen A-MS, Dalton SO. Study designs may influence results: the problems with questionnaire-based case–control studies on the epidemiology of glioma. British Journal of Cancer. 2017;116(7):841-8.
8. Wiffen PJ, Wee B, Derry S, Bell RF, Moore RA. Opioids for cancer pain-an overview of Cochrane reviews. Cochrane Database of Systematic Reviews. 2017(7).
9. Larach DB, Hah JM, Brummett CM. Perioperative opioids, the opioid crisis, and the anesthesiologist. Anesthesiology. 2022;136(4):594-608.
10. Amin-Esmaeili M, Rahimi-Movaghar A, Sharifi V, Hajebi A, Radgoodarzi R, Mojtabai R, et al. Epidemiology of illicit drug use disorders in Iran: prevalence, correlates, comorbidity and service utilization results from the Iranian Mental Health Survey. Addiction. 2016;111(10):1836-47.
11. Lama A, Lama D. SUBSTANCE ABUSE AND ENVIRONMENTAL FACTORS: A REFLECTIVE DISCUSSION. Indian Journal of Health Social Work. 2022;4(2):3.
12. Brener ND, Billy JO, Grady WR. Assessment of factors affecting the validity of self-reported health-risk behavior among adolescents: evidence from the scientific literature. Journal of adolescent health. 2003;33(6):436-57.
13. Napper LE, Fisher DG, Johnson ME, Wood MM. The reliability and validity of drug users' self reports of amphetamine use among primarily heroin and cocaine users. Addictive behaviors. 2010;35(4):350-4.
14. Shakeri R, Kamangar F, Mohamadnejad M, Tabrizi R, Zamani F, Mohamadkhani A, et al. Opium use, cigarette smoking, and alcohol consumption in relation to pancreatic cancer. Medicine. 2016;95(28).
15. Pourshams A, Khademi H, Malekshah AF, Islami F, Nouraei M, Sadjadi AR, et al. Cohort profile: the Golestan Cohort Study—a prospective study of oesophageal cancer in northern Iran. International journal

of epidemiology. 2010;39(1):52-9.
16. Clark CB, Zyambo CM, Li Y, Cropsey KL. The impact of non-concordant self-report of substance use in clinical trials research. Addictive behaviors. 2016;58:74-9.
17. Gans JE, Brindis CD. Choice of research setting in understanding adolescent health problems. Journal of Adolescent Health. 1995;17(5):306-13.
18. Gfroerer J, Wright D, Kopstein A. Prevalence of youth substance use: the impact of methodological differences between two national surveys. Drug and alcohol dependence. 1997;47(1):19-30.