Published in final edited form as:
*Subst Abus*. 2014 ; 35(1): 12–20. doi:10.1080/08897077.2013.789463.

# How patients understand the term 'nonmedical use' of prescription drugs: insights from cognitive interviews

**Jennifer McNeely, MD, MS**,
Department of Population Health and Department of Medicine, Division of General Internal Medicine, NYU School of Medicine, 550 1st Avenue, VZ30, 6th Floor, New York, NY 10016, Tel (212) 263-4975, Fax (646) 501-2706

**Perry N. Halkitis, PhD, MPH**,
Department of Applied Psychology, NYU Steinhardt School of Culture, Education, and Human Development and Department of Population Health, NYU School of Medicine

**Ariana Horton, MSN, RN, BSN**,
NYU College of Nursing

**Rubina Khan, PAC, MPA**, and
Department of Population Health, NYU School of Medicine

**Marc N. Gourevitch, MD, MPH**
Department of Population Health, NYU School of Medicine

Jennifer McNeely: jennifer.mcneely@nyumc.org; Perry N. Halkitis: perry.halkitis@nyu.edu; Ariana Horton: aeh399@nyu.edu; Rubina Khan: rubina.khan@nyumc.org; Marc N. Gourevitch: marc.gourevitch@nyumc.org

## Abstract

**Background—**With rising rates of prescription drug abuse and associated overdose deaths, there is great interest in having accurate and efficient screening tools that identify nonmedical use of prescription drugs in health care settings. We sought to gain a better understanding of how patients interpret questions about misuse of prescription drugs, with the goal of improving the accuracy and acceptability of instruments intended for use in primary care.

**Methods—**A total of 27 English speaking adult patients were recruited from an urban safety net primary care clinic to complete a cognitive interview about a four-item screening questionnaire for tobacco, alcohol, illicit drugs, and misuse of prescription drugs. Detailed field notes were analyzed for overall comprehension of the screening items on illicit drug use and prescription drug misuse, the accuracy with which participants classified drugs into these categories, and whether the screening response correctly captured the participant's substance use behavior.

**Results—**Based on initial responses to the screening items, 6 (22%) participants screened positive for past year prescription drug misuse, and 8 (30%) for illicit drug use. The majority (26/27) of participants correctly interpreted the item on illicit drug use, and appropriately classified drugs in this category. Eleven (41%) participants had errors in their understanding of the prescription drug misuse item. The most common error was including use of medications without

Correspondence to: Jennifer McNeely, jennifer.mcneely@nyumc.org.

Statement of Contributions:
JM conceived of the study, conducted the interviews, and led the writing and analysis
PH assisted with study design, advised on the analysis, and contributed to the writing
RK led data collection and participated in interpretation of results
AH contributed to the analysis and presentation of results and contributed to the writing
MG assisted with conception and design of the study and contributed to the writing
All authors have approved of the final manuscript

abuse potential as misuse. All cases of misunderstanding prescription drug misuse occurred among participants who screened negative for illicit drug use.

**Conclusions—**Our results suggest that terminology used to describe misuse of prescription medications may be misunderstood by many primary care patients, particularly those who do not use illicit drugs. Failure to improve upon the language used to describe prescription drug misuse in screening questionnaires intended for use in medical settings could potentially lead to high rates of false positive results.

### Keywords

Screening; Prescription drug misuse

## INTRODUCTION

There is intense interest in identifying and addressing substance use in general healthcare settings. Considerable federal resources are now devoted to promoting 'screening and brief intervention (SBI)' approaches for alcohol and other drugs, which involve screening and assessment, followed by brief counseling interventions that can be carried out by medical providers in the course of a regular office visit.[1,2,3,4,5] Having a short and accurate substance use screening and assessment instrument is essential for the successful implementation of SBI in time-pressured general medical settings. In response, researchers have moved rapidly to develop and validate brief screening tools.[6,7,8,9,10,11]

Recent developments highlight the importance of identifying not only use of alcohol and illicit drugs, but also misuse of prescription drugs. Prescription drug misuse, and in particular the misuse of potent prescription opioids, has skyrocketed in the past decade.[12] Overdose deaths attributed primarily to prescription opiates are now the leading cause of accidental deaths among adults,[13,14] and emergency room visits due to prescription painkiller misuse have doubled in the past five years.[15] Currently there is no standardized approach to accurately and efficiently screening adult patients for misuse of prescription drugs.

Many individuals who misuse prescription drugs are not engaged in use of any illicit drugs. [16] To capture this increasingly prevalent type of drug use, screening tools need to be able to detect prescription drug misuse independently from illicit drug use. Yet the screening and assessment instruments that are generally considered for implementation in medical settings (e.g. DAST-10, ASSIST) were developed at a time when prescription drug misuse was less prevalent, and little is known about their effectiveness for identifying it. Newer instruments, such as the NIDA-modified ASSIST and the single item drug screening question developed by Smith et al. (2010) have included prescription drugs.[6,17] But the NIDA-modified ASSIST has not been validated, and the single item drug screening question, which does have good sensitivity and specificity for detecting any drug use, has not been evaluated for its accuracy in specifically detecting prescription drug misuse.

Concisely and clearly communicating the meaning of prescription drug misuse on a short screening instrument poses considerable challenges. Unlike illicit drugs, which are defined by their legal status, prescription drugs can be used appropriately or can be misused, depending on the conditions under which they are used and the intentions of the user. To draw a distinction between appropriate medical use and misuse of prescription medications, the language adopted by both the single item drug screening question and the NIDA-modified ASSIST is 'nonmedical' use. Yet little is known about how patients interpret this term.

As a first step in developing a screening instrument that could quickly and accurately identify both illicit and prescription drug misuse, we sought to gain a better understanding of how primary care patients interpret and answer screening questions about their use of these substances. We employed cognitive interviewing, an approach developed in the 1980s by survey methodologists and psychologists to evaluate sources of response error in questionnaires. Cognitive interviewing is supported by a large body of methodological research, and is one of the primary methods used by survey researchers to test the accuracy with which items are understood and answered by respondents. [18,19,20,21,22] Given the similarity between surveys and structured screening instruments, we applied cognitive interviewing techniques to elucidate how primary care patients understand items in a substance use screening questionnaire.

Cognitive interviewing recognizes that the question answering process can be complex, involving the cognitive steps of comprehending the question, retrieving relevant information from memory, making a decision about how to answer, and then mapping the response onto the options given in the survey question. We postulated that answering questions about illicit and prescription drug use primarily poses difficulty in the areas of comprehension and deciding on an answer. Comprehending the question requires an understanding of the language used to describe the drug or behavior, such as ‘nonmedical’ or ‘illegal’ use. Making a decision about how to answer is influenced by the participant’s comfort with the way in which the question is asked, and is important to consider when the item includes stigmatized behavior such as drug use.

## METHODS

### Participants

The study was conducted in over a 3-month period in early 2012, in the adult primary care medicine clinics of a large public hospital in New York City. Individuals eligible to participate were current clinic patients, fluent in English, and 18–65 years old. A purposeful sampling approach was used to achieve approximately equal numbers of male and female participants in the predetermined age categories of 18–35 years, 36–50 years and 51–65 years. These categories were chosen to achieve a balanced representation of groups within a primary care population that would likely be targeted for substance use screening. Potential participants were approached consecutively in the clinic waiting area and screened for eligibility. There was no advertisement of the study, and all recruitment was by a single research assistant. Those expressing interest received a written information sheet, and verbal consent for participation was obtained. The NYU School of Medicine Institutional Review Board of reviewed and approved of all study procedures.

### Data Collection

Participants completed a 30–40 minute interview that sought to ascertain their understanding of a brief substance use screening questionnaire. The questionnaire consisted of 4 items assessing past year use of tobacco, unhealthy alcohol consumption, illicit drug use, and misuse of prescription drugs (Table 1). The questionnaire was adapted from the NIDA Quick Screen V1.0, which was developed by NIDA for use in healthcare settings but has not yet been validated.[23] This screening tool incorporates elements of the single item screening questions for alcohol and drugs that were developed and validated in a primary care population by Smith et al. (2010).[6,24] Depending on the version of the questionnaire used, participants were given response options of entering a number, giving a dichotomous response (yes or no), or categorizing their frequency of use (never, once or twice, more than once or twice, or frequently). All subjects were given a one-page handout containing the screening questionnaire.

For each item in the questionnaire, participants were first asked to answer the item using the specified response categories, and then to respond to a series of follow-up questions from the interviewer. Because the goal was to understand the thought processes guiding participants' responses, they were asked to 'think-aloud' as they initially formulated their answer. Thinking-aloud was demonstrated by the interviewer, and then practiced by participants using a warm-up item before beginning the interview. After the participant responded to each item in the screening questionnaire, the interviewer used a series of probes and open-ended questions to gather more information on the cognitive process. Participants were asked to explain what they were thinking about as they answered the item, to repeat the item in their own words, to describe how they formulated their answer, and to assess whether the question was easy or difficult to answer. They were also asked to give examples of the type of substance that each screening question asked about (e.g. to name substances that belong in the 'illegal drug' category for the illicit drug item). Responses to the screening items in the primary questionnaire were recorded based upon the participant's initial answer, and were not changed based on responses later in the interview. All interviews were conducted by the primary author (JM).

Two adaptations were made to the questionnaire after the first 16 interviews were completed. The first adaptation was to change from an interviewer- to a self-administered screening form. The first 16 subjects (Study ID# 1–16) were read each item by the interviewer and answered verbally. The following 11 subjects (Study ID# 17–27) read and completed the questionnaire on their own (8 on paper, 3 on a touchscreen computer) before proceeding with the cognitive interview. The self-administered approach was introduced to assess the feasibility of administering the questionnaire without an interviewer's assistance. However, to ensure that reading difficulty did not interfere with the cognitive interviewing assessment, all participants were read each item aloud by the interviewer before answering the additional probes and open-ended questions.

A second adaptation was altering the term used to describe prescription drug misuse. The initial interviews (Study ID #1–16) asked participants about use of any prescription drug 'for nonmedical reasons,' while for subsequent participants (Study ID #17–27) the item was changed to use of any prescription drug 'recreationally.' This change was made based on responses to the initial interviews, which indicated that some participants misinterpreted the meaning of 'nonmedical reasons.' The choice of 'recreationally' to describe misuse was guided by findings from the initial 16 interviews, which explored alternative approaches to phrasing the prescription drug item. These alternative items were administered and discussed in a second part of the interview, following completion of the screening questionnaire and cognitive interviewing portions that are the focus of the present analysis. Five items were tested, of which each participant received two or three. These items were adapted from terms that have been used in other substance use questionnaires and surveys, and described the behavior of prescription drug misuse as taking a prescription medication a) *recreationally*, b) *only for the experience or feeling it caused*,[25] c) *in a way the doctor didn't intend*,[26] d) *to get high*,[27] and e) *have you abused any prescription drug*.[28] The item describing prescription drug misuse as using medications 'recreationally' was not initially included, but was added after being suggested by participants during the early interviews. Because the 'recreationally' version was better accepted and more clearly understood by participants than the other alternative items, it was selected for inclusion in the screening questionnaire for the last 11 interviews.

## Analysis

During each interview, notes were taken on paper by two members of the research team, (the interviewer and an observer). These interview notes were incorporated into detailed field

notes that were written by each of the two researchers at the end of every interview day. To facilitate the accurate recording of field notes, a maximum of two interviews were conducted per day. Notes included participants' verbatim responses when feasible, which were designated with quotation marks. The field notes, as well as responses to the screening questionnaire, were the data used for this analysis.

This analysis focuses primarily on the screening question for misuse of prescription drugs, and secondarily on the screening question for illicit drugs. On the screening questionnaire, any response greater than 'never' or 'zero' was considered a positive screen. We examined the field notes for participants' freely given definitions of nonmedical or recreational use of prescription medications, comprehension of screening questions intended to describe misuse of prescription medications, and examples of illegal drugs and of drugs that could be used nonmedically or recreationally. Notes were analyzed by the interviewer and by a second investigator who was not present during the interviews.

The first step in our analysis was to create a matrix that listed individual responses to each questionnaire item, whether the participant seemed to have a correct understanding of the question, and a summary of the participant's explanation for why they gave this response.[29] In a second step, the field notes were entered into Atlas.ti (version 6.2.27) and analyzed for themes related to comprehension of the illicit drug use and prescription drug misuse items. Codes were developed by the primary author in the course of the analysis using a grounded theory approach. Codes identified examples of how the questionnaire item was interpreted, types of correct and incorrect responses to the item, and names of drugs that would be included in that category.

We then sought to determine whether responses to the illicit drug use and prescription drug misuse screening items were correct versus incorrect, based on the final coded interviews. For *illicit drug* use, having a correct answer required naming only illegal drugs, and an incorrect answer would include only legal drugs. An imprecise answer would include both illegal drugs and legal substances having abuse potential (e.g. alcohol). For *prescription drug* misuse, the minimum criteria for a 'correct' response were a) included only prescription medications having abuse potential (controlled substances), and b) taken other than as prescribed (which could include taking without a prescription, taking more or for reasons other than as prescribed, and taking for a euphoric effect). Responses that failed to meet both of these criteria were classified as 'incorrect.' Responses that included the two elements of a correct response, but also discussed use of prescription medications without abuse potential, (taken for reasons other than as prescribed), were classified as imprecise. For example, a participant who described nonmedical use as taking a higher than prescribed dose of benzodiazepines 'to get high' but also said that taking a selective serotonin reuptake inhibitor (SSRI) without a prescription is nonmedical use, would be classified as imprecise. The second investigator reviewed the uncoded interviews and made an independent determination of whether the participant's response was correct, incorrect, or imprecise. Discrepancies in classification between the two investigators conducting the analysis were identified and discussed, until consensus was reached on each participant's responses.

We examined the frequency of correct, incorrect, and imprecise responses to the illicit and prescription drug use items by screening response (positive vs. negative screen). We then looked for respondent characteristics (such as age, gender, education level, other drug use) that might be associated with misclassification. In a final step, we compared the screening response to the participant's reported drug use behavior from the entire interview and determined that the participant entered a correct response (demonstrating concurrence with the narrative description of drug use), or an incorrect response (demonstrating lack of concurrence with the narrative description).

# RESULTS

Characteristics of the 27 participants are summarized in Table 2. While all participants were fluent in English, for 6 English was not their primary language. Eight participants were born outside the US. Participants' initial responses to the 4 items included in the screening questionnaire are displayed in Table 3.

## Definitions of prescription drug misuse

After answering each screening item, participants were asked to give their own description or definition of its meaning. For the prescription drug item, which was phrased as either nonmedical use or recreational use, 5 of the 27 participants described a full range of behaviors that could be considered misuse of prescription drugs. These behaviors included taking a medication only for its euphoric effects, and taking a medication having abuse potential that was either not prescribed, or was prescribed but then taken either more frequently or at higher doses than directed. For example, this participant described recreational use as: "[n]ot taking it when you're supposed to, or over taking it…taking too many pills…taking it too often…abusing medication." (Study ID #18: Female, 51 years) More frequently, participants (n=9) gave a limited definition, with the dominant theme being taking a medication 'to get high' or for pleasure. Participant answers included: "[w]hen you take something because you wanna get a high or a good feeling… a feeling of being happy" (Study ID #26: Female, 62 years), and "[f]or example with a pain medicine prescribed for pain, if you were still taking it because it gives you a high or something extra…that's not what the medication is for." (Study ID #13: Male, 52 years)

Two participants did not emphasize the euphorigenic aspects of prescription drug misuse, and instead described addictive behaviors in their definitions. One of these participants focused on illegitimate medication seeking, while the other discussed the risks of addiction and overdose. No participants included taking a prescription medication for a condition other than that for which it was prescribed in their definitions of prescription drug misuse.

## Differences in interpretation of 'nonmedical' versus 'recreational' use

There was considerable overlap in responses among those who were administered the screening question phrased as using prescription drugs 'for nonmedical reasons' (n=16) versus 'recreationally' (n=11). However, there were some differences between interpretations of these items that fell into an identifiable pattern. Nonmedical use definitions generally focused on taking medications that were not prescribed by a medical provider, while recreational use definitions focused on taking medications for pleasure.

### Nonmedical use

**Nonmedical use interpreted to include medications without abuse potential:** Many participants described nonmedical use in terms of taking *any* medication without a prescription, including medications that are not considered to have abuse potential. 5 of the 16 participants who received the 'nonmedical use' version of the screening question interpreted it to include use of over-the-counter drugs. Others (n=3) included as nonmedical use medications that may be prescribed but are not controlled substances. Examples included Lipitor, and acetaminophen prescribed by a medical provider (Table 4).

**Nonmedical use as self medicating:** Nonmedical use was viewed by some participants as taking medications for the purpose of treating a legitimate medical condition, but without seeking the care of a medical provider. We classified this behavior as self medicating. Of those participants who received the nonmedical use version of the screening item, 6 described it as self medicating. For example, "[n]onmedical means it's something the doctor

didn't prescribe for you, you decided to take it on your own." (Study ID #14: Male, 39 years) Another participant described nonmedical use as taking "[m]edicine that could cure you, but that is not with a doctor's recommendation," and went on to explain that "[t]he difference is that for non-medical, it's not required to see the doctor." (Study ID #10, Male, 19 years)

Another participant talked about nonmedical use being an illicit behavior, but also something that may be engaged in by individuals who lack access to medical care: Her initial response was "[r]ight away I think of drug addicts." But then she went on to say that she also thinks of people who have problems with immigration, who can't get medications. In this scenario, she said, "[i]t may be justified, but it's still nonmedical." (Study ID #9: Female, 30 years)

In other cases, it was less clear that the drug would be medically indicated, but the intention is still to treat what the patient believes is a legitimate medical problem. One participant responded that "medical use is what the doctor tells you", while "nonmedical use is playing doctor, taking it into my own hands, which I might do if the doctor wasn't giving me what I need." (Study ID #8: Female, 28 years)

### Recreational use

**Recreational use as taking medications to get high:** In contrast, for the 11 participants who received the 'recreational use' version of the screening question, most definitions (n=7) focused on taking medications for their euphoric effects. These participants indicated that using recreationally means taking medication "to have fun, get high, party with." (Study ID #20: Female, 56 years)

**Recreational use and addiction:** Two participants, both of whom had used illicit drugs in the past, noted a discrepancy between recreational use and addiction. As one pointed out, individuals who are addicted to a drug may not consider their use to be fully voluntary or recreational: "There's a difference between doing drugs recreationally and being addicted… [r]ecreationally is more of a want, and addiction is a need." (Study ID #19: Male, 65 years) Despite this distinction, the participant believed that someone who was addicted would still respond affirmatively if they were asked about recreational use on a screening questionnaire.

**Misinterpretation of the term 'recreationally':** Two of the 11 participants who received this item did not understand the meaning of 'recreationally' and instead interpreted it to mean 'occasionally,' as in taking it only as needed for symptoms. None included over-the-counter medications in their examples of drugs that might be used recreationally.

## Definitions of illicit drug use

Definitions and examples of illicit drug use focused on the illegal status of these substances. Misclassification of drugs belonging to this category was uncommon (Table 4). One participant (10C: male, 19 years) included tobacco and alcohol in his examples of 'illegal drugs.' Two participants included prescription medications with abuse potential (benzodiazepines, opioids) in this category along with illegal drugs such as heroin, marijuana, and cocaine. In the context of the interview, it was clear that these participants were listing these prescription medications as examples of drugs that are bought and sold illicitly.

## Overall understanding of screening items and accuracy of screening response

**Illicit drug use—**Among the 27 participants, 26 (96%) correctly understood the screening item for illicit drug use (Table 5). One participant had an imprecise understanding, based on

including tobacco and alcohol in this category along with illicit drugs. Because the 3 participants who listed street-purchased medications (pills, sedatives, opioids) as illicit drugs restricted their classification to drugs that were bought and sold illicitly, they were considered to have an overall correct understanding of illicit drug use. The single case of an inaccurate screening response came from a participant who correctly understood the meaning of 'illegal drugs,' but mistakenly reported lifetime use rather than past year use and thus generated an inaccurate (positive) screening result.

**Prescription drug misuse—**Of the 16 participants who received the nonmedical use version of the prescription drug item, 8 (50%) understood it correctly. Five had an incorrect, and 3 had an imprecise understanding of the screening item. Among the 8 participants with an incorrect or imprecise understanding of the screening item, 6 screened negative for prescription drug misuse. The screening result was accurate, in that it reflected the participant's narrative account of their drug use, for all individuals with a correct understanding of the item. The screening result was inaccurate for 2 of the 8 participants with an incorrect or imprecise understanding of the item: one participant screened positive based on their Tylenol use, and the other screened negative because they did not consider taking a drug prescribed to someone else to be nonmedical use.

For the 11 participants who received the recreational use version of the screening item, 8 (73%) understood it correctly. Among the 2 participants with an incorrect understanding of the item, 1 did not give an answer and the other interpreted 'recreationally' to mean 'occasionally.' The participant with an imprecise understanding included antidepressants and appetite suppressants, along with pain medications, in their examples of drugs that could be used recreationally. One participant misread the question as asking how many prescription medications she took, but had a correct understanding of the screening item when it was read by the interviewer. As a result, although she had a correct understanding of recreational use her response on the screening form was inaccurate.

In examining characteristics of the 11 individuals who had an incorrect (n=7) or imprecise (n=4) response to the prescription drug misuse item, we found that all screened negative for illicit drug use. Conversely, a correct interpretation of the prescription drug item was given by all 7 participants who screened positive for illicit drugs. Females appeared to have a higher frequency of incorrect responses to the prescription drug item (5/14 females versus 2/13 males). We did not observe a clear association between correctness of response to the prescription drug item and age, race, education level, or primary language.

## DISCUSSION

Many primary care patients in our sample misunderstood the language used to describe misuse of prescription medications. The screening item using the term 'nonmedical' use frequently led to misclassification errors, the most common of which was inclusion of drugs without abuse potential, including over-the-counter medications. Understanding seemed to improve somewhat when the question was rephrased as using a medication 'recreationally.'

While the concept of recreational use seemed easier for most participants to grasp, this term also has potential drawbacks. One participant misinterpreted 'recreationally' to mean 'occasionally,' and generated a false positive screen as a result. It is also possible that using a term such as recreational use, which focuses on euphoric effects, may fail to capture use of prescribed medications for conditions other than that for which they were prescribed. For example, a patient who had an opioid prescribed for back pain and then took it for help with sleep may not classify their use as recreational, though this behavior would be considered misuse of a prescription drug.

Despite being better understood by most participants, the accuracy of the screening response was not improved by changing the term to 'recreationally.' However, interpretation of these results are confounded by switching to a self-administered version of the questionnaire, at the same time that the screening item was changed from 'nonmedical reasons' to 'recreationally.' Among those who received the nonmedical (interviewer-administered) version, the two inaccurate responses were generated by misinterpreting the intent of the screening question (to include over-the-counter medication in one case, and to exclude use of a drug having abuse potential that was not prescribed to her in the other). In the recreational (self-administered) version, the inaccurate responses were due to language difficulty. One participant correctly described prescription drug misuse but read the question as asking how many prescription medications she took, and the other thought the word 'recreationally' meant 'occasionally.' Rephrasing the question using the words 'recreational use' instead of 'recreationally,' or adding a clarification of the term 'recreationally' could potentially improve the performance of this item.

Most individuals who misunderstood the meaning of the prescription drug screening item in fact did not appear to be engaged in misuse. We found a relatively low rate of false positive screens (3 of 27 participants) when the screening result was compared to narrative descriptions of actual drug use behavior. Another two participants were unable to give an answer. This implies that among our sample, 5/27 (18%) would require further assessment due to either poor understanding or inability to respond to the prescription drug misuse language. By contrast, for the illicit drug use item there was just one inaccurate screening response, and the question was answered by each of the 27 participants.

All participants who reported illicit drug use had a correct interpretation of prescription drug misuse. All those who had an incorrect or imprecise interpretation of prescription drug misuse screened negative for illicit drugs. This may indicate that among populations with relatively low rates of illicit drug use, as in primary care, screening instruments to detect prescription drug misuse are likely to have a higher rate of misclassification.

## Limitations

The primary limitation of our study is its small sample size, which hinders the generalizability of our results and precludes the ability to rigorously test for predictors of correct versus incorrect understanding of the screening items. Our assessment of accuracy of the screening response relied only on the participant's narrative description of their actual substance use behavior during the course of the interview, and did not include additional questionnaires or a medication review. Additional measures of substance use could have provided stronger evidence of the screener's accuracy, and would be required for a validation study. We did not test the 'nonmedical reasons' version of the prescription drug item in a self-administered questionnaire, and we did not test the 'recreationally' version in an interviewer-administered questionnaire. This limited our ability to compare the accuracy of the screening response based upon wording alone.

Another potential limitation was the relatively small number of illicit or prescription drug users, though the prevalence in our sample is equivalent to, or somewhat higher, than what is found in other primary care settings,[3,4,6] Consistent with our diverse urban safety net patient population, over one-third of our sample had high school degree/GED or less and a high percentage was foreign born. The language used in the screening questionnaire may be easier to interpret for a highly educated or less culturally diverse population. Yet given the goal of developing screening tools that can be used in a wide range of primary care settings, these attributes of the study population could also be interpreted as a strength of our approach.

### Conclusions

In terms of prevalence as well as morbidity and mortality, prescription drug misuse is becoming the US's dominant drug problem. Any broadly recommended screening tool should be able to identify prescription drug misuse, and to elicit it even among those who are not engaged in illicit drug use. Yet there is currently no brief screening tool, suitable for use in medical settings, that has been validated specifically for detection of prescription drug misuse in a general primary care population. Nonmedical use language has the potential to lead to a substantial number of false positive or invalid responses on standardized screening instruments. These responses would trigger further assessment to rule out a substance use problem; a process that could present a significant burden to health care systems. Our findings indicate that language that describes the purpose of using these drugs, such as 'recreational use,' may be more easily understood by primary care patients, but it could fail to capture prescription drug misuse that is not for euphoric effects.

Finally, it should be noted that many instruments considered for screening and assessment in primary care patients were validated in populations having a higher prevalence of illicit drug use, such as in drug treatment or psychiatric patients. We found that individuals who reported illicit drug use were able to correctly understand the screening questions on prescription drug misuse, but there was considerable misinterpretation of these questions among individuals who did not use illicit drugs. Our study thus highlights the potential hazards of adopting substance use screening instruments in general medical settings without rigorously evaluating their accuracy in the population in which they are intended to be used.

## Acknowledgments

The authors thank Shiela Strauss, John Rotrosen, Scott Sherman, Donna Shelley, Andrew Wallach, Valerie Perel, Barbara Porter, Derek Nelsen, and Arianne Ramautar for their contributions to this research.

Funding sources:

NIH-NIDA K23DA030395

NIH/NCRR 1UL1RR029893 (NYU-HHC CTSI Pilot Grant)

NIH-NIDA 2R25DA022461

NYU School of Medicine Center of Excellence on Addictions (Seed Grant)

The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute on Drug Abuse, the National Institutes of Health, or the NYU School of Medicine.

## References

1. Babor TF, McRee BG, Kassebaum PA, Grimaldi PL, Ahmed K, Bray J. Screening, brief intervention, and referral to treatment (SBIRT): Toward a public health approach to the management of substance abuse. Substance Abuse. 2007; 28(3):7–30. [PubMed: 18077300]
2. Substance Abuse and Mental Health Services Administration. [Accessed Nov 12, 2011.] White paper on screening, brief intervention and referral to treatment (SBIRT) in behavioral healthcare. http://www.samhsa.gov/prevention/SBIRT/SBIRTwhitepaper.pdf
3. Saitz R, Alford DP, Bernstein J, Cheng DM, Samet J, Palfai T. Screening and brief intervention for unhealthy drug use in primary care settings: randomized clinical trials are needed. J Addict Med. 2010; 4:123–130. [PubMed: 20936079]
4. Madras BK, Compton WM, Avula D, Stegbauer T, Stein JB, Clark HW. Screening, brief interventions, referral to treatment (SBIRT) for illicit drug and alcohol use at multiple healthcare sites: Comparison at intake and 6 months later. Drug Alc Depend. 2009; 99:280–95.

5. Substance Abuse and Mental Health Services Administration. Treatment Improvement Protocol (TIP) Series 24. Rockville, MD: Center for Substance Abuse Treatment; 1997. A guide to substance abuse services for primary care clinicians.
6. Smith PC, Schmidt SM, Allensworth-Davies D, Saitz R. A single-question screening test for drug use in primary care. Arch Intern Med. 2010; 170:1155–1160. [PubMed: 20625025]
7. Brown RL, Rounds LA. Conjoint screening questionnaires for alcohol and other drug abuse: criterion validity in a primary care practice. Wis Med J. 1995; 94:135–40. [PubMed: 7778330]
8. Skinner HA. The Drug Abuse Screening Test. Addict Behav. 1982; 7:363–67. [PubMed: 7183189]
9. National Institute on Drug Abuse (NIDA). [Accessed May 14, 2011.] NIDA Quick Screen: Clinician's screening tool for drug use in general medical settings. http://ww1.drugabuse.gov/nmassist/
10. Knight JR, Shrier LA, Bravender TD, Farrell M, Vander Bilt J, Shaffer HJ. A new brief screen for adolescent substance abuse. Arch Pediatr Adolesc Med. 1999; 153:591–96. [PubMed: 10357299]
11. Berman AH, Bergman H, Palmstierna T, Schlyter F. Evaluation of the Drug Use Disorders Identification Test (DUDIT) in Criminal Justice and Detoxification Settings and in a Swedish Population Sample. European Addiction Research. 2005; 11:22–31. [PubMed: 15608468]
12. Substance Abuse and Mental Health Services Administration (SAMHSA). Results from the 2010 National Household Survey on Drug Use and Health: Detailed Tables. Rockville, MD: Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality; 2011. http://oas.samhsa.gov/NSDUH/2k10NSDUH/tabs/Sect1peTabs1to10.pdf [Accessed Oct 3, 2012.]
13. Warner, M.; Chen, LH.; Makuc, DM.; Anderson, RN.; Minino, AM. [Accessed Oct 3, 2012.] Drug poisoning deaths in the United States, 1980–2008. NCHS Data Brief Dec. 2011. (DHHS Publication No. (PHS) 2012–1209). http://www.cdc.gov/nchs/data/databriefs/db81.pdf
14. Centers for Disease Control and Prevention. [Accessed Oct 3, 2012.] Policy Impact: Prescription painkiller overdoses. Dec. 2011 http://www.cdc.gov/homeandrecreationalsafety/rxbrief/
15. Substance Abuse and Mental Health Services Administration. Drug Abuse Warning Network: selected tables of national estimates of drug-related emergency department visits. Rockville, MD: Center for Behavioral Health Statistics and Quality, SAMHSA; 2010.
16. Becker WC, Sullivan LE, Tetrault JM, Desai RA, Fiellin DA. Non-medical use, abuse and dependence on prescription opioids among U.S. adults: psychiatric, medical and substance use correlates. Drug Alc Dep. 2008; 94:38–47.
17. National Institute on Drug Abuse (NIDA). [Accessed May 14, 2011.] Screening for drug use in general medical settings: A resource guide for providers. http://www.drugabuse.gov/nidamed/resguide/resourceguide.pdf
18. Campanelli P. Testing survey questions: New directions in cognitive interviewing. Bulletin de Methodologie Sociologique. 1997; 55:5–17.
19. Campanelli P, Martin E, Rothgeb JM. use of respondent and interviewer debriefing studies as a way to study response error in survey data. The Statistician. 1991; 40:253–264.
20. Willis GB, Royston P, Bercini D. The use of verbal report methods in the development and testing of survey questionnaires. Applied Cognitive Psychology. 1991; 5:251–267.
21. Willis GB, Schechter S. Evaluation of cognitive interviewing techniques: do the results generalize to the field? Bulletin de Methodologie Sociologique. 1997; 55:40–66.
22. Jabine, T.; Straf, M.; Tanur, J.; Tourangeau, R., editors. Cognitive Aspects of Survey Methodology: Building a Bridge Between Disciplines. Washington, DC: National Academy Press; 1984. Tourangeau, R. Cognitive sciences and survey methods; p. 73
23. National Institute on Drug Abuse (NIDA). [Accessed May 14, 2011] NIDA Quick Screen: Clinician's screening tool for drug use in general medical settings. at http://ww1.drugabuse.gov/nmassist/
24. Smith PC, Schmidt SM, Allensworth-Davies D, Saitz R. Primary care validation of a single-question alcohol screening test. J Gen Intern Med. 2009; 24(7):783–88. [PubMed: 19247718]
25. Substance Abuse and Mental Health Services Administration (SAMHSA). Results from the 2009 National Household Survey on Drug Use and Health: Volume II, Technical appendices and selected prevalence tables. Rockville, MD: Substance Abuse and Mental Health Services

Administration, Center for Behavioral Health Statistics and Quality; 2010. http://oas.samhsa.gov/NSDUH/2k9NSDUH/2k9ResultsApps.htm#AppC [Accessed March 1, 2013.]

26. Huang B, Dawson DA, Stinson FS, et al. Prevalence, correlates, and comorbidity of nonmedical prescription drug use and drug use disorders in the United States: results of the National Epidemiologic Survey on Alcohol and Related Conditions. J Clin Psychiatry. 2007; 67:1062–73. [PubMed: 16889449]
27. Knight JR, Shrier LA, Bravender TD, Farrell M, Vander Bilt J, Shaffer HJ. A new brief screen for adolescent substance abuse. Arch Pediatr Adolesc med. 1999; 153:591–6. [PubMed: 10357299]
28. Skinner HA. The Drug Abuse Screening Test. Addict Behav. 1982; 7:363–7. [PubMed: 7183189]
29. Aicken CR, Gray MG, Clifton S, et al. Improving questions on sexual partnerships: lessons learned from cognitive interviews for Britain's Third National Survey of Sexual Attitudes and Lifestyles ("Natsal-3"). Arch Sex Behav. 2013; 42:173–85. [PubMed: 22695641]

## Table 1

Items included in the screening questionnaire

| Item | Administered to participants |
|---|---|
| 1. In the past year, how often have you used tobacco? | #1–27 |
| 2. In the past year, how often have you used alcohol, X or more drinks in a day? (X = 5 for men and = 4 for women) | #1–27 |
| 3. In the past year, how often have you used any illegal drug? | #1–27 |
| 4(a). In the past year, how often have you used any prescription drug for non-medical reasons?<br>4(b). In the past year, how often have you used any prescription drug recreationally? | #1–16 (interviewer administered)<br>#17–27 (self administered) |

**Table 2**

Characteristics of the 27 participants

| Characteristic | N (%) |
|---|---|
| Age(years) | |
| Mean, SD | 44, 14 |
| Median | 48 |
| Range | 19–65 |
| Interquartile range | 25 |
| Gender | |
| Female | 14 (52) |
| Male | 13 (48) |
| Race/Ethnicity | |
| Black non-Hispanic | 9 (33) |
| White non-Hispanic | 8 (30) |
| Hispanic | 7 (26) |
| Asian | 1 (4) |
| Other | 2 (7) |
| Foreign Born | 8 (30) |
| Primary language | |
| English | 21 (78) |
| Spanish | 2 (7) |
| Other | 4 (15) |
| Education | |
| Less than HS | 3 (11) |
| HS grad or GED | 7 (26) |
| Some college or trade school | 7 (26) |
| College degree or higher | 10 (37) |
| Income | |
| <$5,000 | 6 (22) |
| $5,000 to $14,999 | 10 (37) |
| $15,000 to $74,999 | 9 (33) |
| $75,000 or greater | 2 (7) |
| Employment | |
| Employed full-time | 4 (15) |
| Employed part-time or occasional work | 7 (26) |
| Unemployed | 6 (22) |
| Disability | 6 (22) |
| Student/Other | 4 (15) |

## Table 3

Initial responses to the screening questionnaire(N=27)

| Substance | Positive N (%) | Negative N (%) | No answer N |
|---|---|---|---|
| Tobacco | 8 (30) | 18 (67) | 1[a] |
| Alcohol | 12 (44) | 15 (56) | 0 |
| Illicit drugs | 8(30) | 19 (70) | 0 |
| Prescription drugs | 6 (22) | 19 (70) | 2[b] |

[a] ID#3: Interviewer administeredquestionnaire; participant did not comprehend the question.

[b] ID#4: Interviewer administeredquestionnaire; participant refused to answer

ID#17: Self administeredquestionnaire; participant wrote in answer box ‘only what the doctors give’

## Table 4

Examples given by participants of substances belonging in ‘illegal drugs’ and ‘nonmedical (or recreational) use of prescription medications’

| Drug Class | Correctly classified (number of times mentioned) | Incorrectly classified (number of times mentioned) |
|---|---|---|
| Illegal drugs | Marijuana /weed/pot/haze/Thai stick (26)<br>Cocaine /coke (19)<br>Heroin /dope (12)<br>Ecstasy/MDMA (9)<br>Crack (5)<br>Crystal meth (2)<br>Acid (2)<br>Angel dust (1)<br>Mushrooms (1)<br>Opium (1)<br>Glue (1)<br>PCP (1)<br>Recreational drugs (1)<br>‘That date rape drug’ (1) | Tobacco (1)<br>Alcohol (1)<br>Prescription drug misuseclassified as ‘illegal’:<br>Barbiturates (1)<br>Methadone (1)<br>Percocet (1)<br>Xanax (1)<br>Klonopin (1)<br>Pills–‘ups or downers’ (1) |
| Prescription drugs (nonmedical use or recreational use) | ‘Painkillers’ (7)<br>Percocet (5)<br>Vicodin (4)<br>Amphetamines/Adderall (3)<br>Xanax (3)<br>OxyContin (2)<br>Valium (2)<br>Morphine (2)<br>Codeine (1)<br>Tylenol with codeine (1)<br>Sleep aids (1)<br>Barbiturates (1)<br>Muscle relaxants (1)<br>Methadone (1)<br>Appetite suppressant (1)<br>‘Pills’ (1) | Tylenol (6)<br>Advil (3)<br>Antidepressants (3)<br>Cholesterol medications (2)<br>Cold medicine (2)<br>Blood pressure medications (1)<br>Naprosyn (1)<br>Cough syrup (1)<br>[P]enicilin (1)<br>Excedrin (1)<br>Allegra (1) |

**Table 5**

Screening results and accuracy of screening response for participants having correct versus incorrect or imprecise understanding of illicit (illegal) drug use or prescription drug misuse (nonmedical or recreational use)

| | **Illicit Drug Use** | | | | **Prescription Drug Misuse** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Questionnaire Item** | **In the past 12 months, how many times have you used any illegal drugs? N=27** | | | | **In the past 12 months, how many times have you used any prescription drug for nonmedical reasons? N=16** | | | | **In the past 12 months, how many times have you used any prescription drug recreationally? N=11** | | | |
| **Overall understanding of screening item** | **Correct N** | **Incorrect N** | **Imprecise N** | **TOTAL N (%)** | **Correct N** | **Incorrect N** | **Imprecise N** | **TOTAL N (%)** | **Correct N** | **Incorrect N** | **Imprecise N** | **TOTAL N (%)** |
| | 26/27 (96%) | 0/27 (0%) | 1/27 (4%) | **27/27 (100%)** | 8/16 (50%) | 5/16 (31%) | 3/16 (19%) | **16/16 (100%)** | 8/11 (73%) | 2/11 (18%) | 1/11 (9%) | **11/11 (100%)** |
| Screening response | | | | | | | | | | | | |
| Negative | 19 | 0 | 1 | **20/27 (74%)** | 6 | 3 | 3 | **12/16 (75%)** | 6 | 0 | 1 | **7/11 (64%)** |
| Positive | 7 | 0 | 0 | **7/27 (26%)** | 2 | 1 | 0 | **3/16 (19%)** | 2 | 1 | 0 | **3/11 (27%)** |
| No answer | 0 | 0 | 0 | **0/27 (0%)** | 0 | 1 | 0 | **1/16 (6%)** | 0 | 1 | 0 | **1/11 (9%)** |
| Accuracy of screening response | | | | | | | | | | | | |
| Accurate | 25 | 0 | 1 | **26/27 (96%)** | 8 | 3 | 2 | **13/16 (81%)** | 7 | 0 | 1 | **8/11 (73%)** |
| Inaccurate | 1 | 0 | 0 | **1/27 (4%)** | 0 | 1 | 1 | **2/16 (13%)** | 1 | 1 | 0 | **2/11 (18%)** |
| No answer | 0 | 0 | 0 | **0/27 (0%)** | 0 | 1 | 0 | **1/16 (6%)** | 0 | 1 | 0 | **1/11 (9%)** |