Drug and Alcohol Dependence 187 (2018) 300–304

Contents lists available at ScienceDirect

Drug and Alcohol Dependence

journal homepage: www.elsevier.com/locate/drugalcdep

Full length article

Republic of Georgia estimates for prevalence of drug use: Randomized response techniques suggest under-estimation

Irma Kirtadze[a,b,*], David Otiashvili[a], Mzia Tabatadze[a,b], Irina Vardanashvili[a,b], Lela Sturua[c], Tomas Zabransky[d], James C. Anthony[e]

[a] Addiction Research Center, Alternative Georgia, Tbilisi, Georgia
[b] Ilia State University, Tbilisi, Georgia
[c] National Center for Disease Control and Public Health, Tbilisi, Georgia
[d] Department of Addictology, First Faculty of Medicine, Charles University in Prague and General University Hospital in Prague, Czech Republic
[e] Michigan State University, East Lansing, MI, USA

ARTICLE INFO

Keywords:
Randomized response techniques
Drug use
Self-report
Surveys

ABSTRACT

Background: Validity of responses in surveys is an important research concern, especially in emerging market economies where surveys in the general population are a novelty, and the level of social control is traditionally higher. The Randomized Response Technique (RRT) can be used as a check on response validity when the study aim is to estimate population prevalence of drug experiences and other socially sensitive and/or illegal behaviors.

Aim: To apply RRT and to study potential under-reporting of drug use in a nation-scale, population-based general population survey of alcohol and other drug use.

Methods: For this first-ever household survey on addictive substances for the Country of Georgia, we used the multi-stage probability sampling of 18-to-64-year-old household residents of 111 urban and 49 rural areas. During the interviewer-administered assessments, RRT involved pairing of sensitive and non-sensitive questions about drug experiences.

Results: Based upon the standard household self-report survey estimate, an estimated 17.3% [95% confidence interval, CI: 15.5%, 19.1%] of Georgian household residents have tried cannabis. The corresponding RRT estimate was 29.9% [95% CI: 24.9%, 34.9%]. The RRT estimates for other drugs such as heroin also were larger than the standard self-report estimates.

Discussion and conclusions: We remain unsure about what is the "true" value for prevalence of using illegal psychotropic drugs in the Republic of Georgia study population. Our RRT results suggest that standard non-RRT approaches might produce 'under-estimates' or at best, highly conservative, lower-end estimates.

1. Introduction

Validity of self-report answers is of special concern in any epidemiological research on sensitive behaviors, including potentially hazardous health practices defined to include extra-medical use of cannabis and internationally regulated drugs. In order to improve accuracy of these survey estimates, an array of research approaches has been devised (Basurto et al., 2009; McGregor and Makkai, 2003). For example, in some national survey contexts, it has been possible to validate self-reports via toxicological testing of biological samples such as urine or hair, or to use methods such as self-interviewing in lieu of interviewer-administered assessments (Colón et al., 2001; Fendrich et al., 1999; Gjerde et al., 2011; Harrison, 1997; Harrison, 1997).

When epidemiological survey research methods have been extended into emerging market economies, several research issues have surfaced. First, in these jurisdictions, the tradition of survey research generally is not strong, and the populations under study can be reluctant to participate when bio-assays are required. Second, harsh criminal penalties (Otiashvili et al., 2016) and social stigma for drug users (Kirtadze et al., 2013) might prompt under-reporting of actual drug experiences among participants.

In this context of epidemiological studies, it is useful to build assumption-checking probes into the survey research plan. One form of assumption-checking probe is known as the Randomized Response Technique (RRT). Originally devised by Warner (1965) and refined by others (e.g., Lensvelt-Mulders et al., 2005), RRT involves asking a

* Corresponding author at: Addiction Research Center Alternative Georgia. Office #2, 14a Nutsubidze Street, 0177, Tbilisi, Georgia.
E-mail address: Irma@altgeorgia.ge (I. Kirtadze).

https://doi.org/10.1016/j.drugalcdep.2018.03.019
Received 24 October 2017; Received in revised form 11 March 2018; Accepted 14 March 2018
Available online 18 April 2018
0376-8716/

respondent to use a randomization device (e.g., to flip a coin or roll dice for a 50:50 odds) before answering a survey question. The critical component of this approach is that the interviewer does not see which of the questions the respondent is answering. The randomization result sets up two 50:50 options that are known to the respondent but unknown to the survey field staff member, and the randomization device determines what the respondent must do: (1) answer a question about a sensitive topic, or (2) answer a question about a non-sensitive topic. Thereafter, 50% of the respondents answer 'Yes' or 'No' to the sensitive question; 50% answer the non-sensitive Yes/No question. As described elsewhere (Blair et al., 2015), the result provides a check on the accuracy and completeness of the self-report survey response validity.

In order to understand the background for use of RRT in the General Population Survey (GPS) in south Caucasian Country of Georgia, it is important that we explain that the GPS approach to drugs research is one that generally is being used to estimate prevalence and frequency of illegal drug use in representative samples of European Union Member States (EMCDDA, 2002). Widespread application of self-report GPS approaches has prompted an appreciation that self-reports might yield "under-estimates" due to the sensitive and generally illegal nature of drug-using behaviors (Colón et al., 2001; Fendrich et al., 1999; Harrison, 1997; McGregor and Makkai, 2003).

In consequence, when planning the first national GPS for Georgia, the issue of survey response validity surfaced because of a widespread appreciation of the severity of criminal penalties when drug use becomes known to the governmental authorities, and possibly due to stigma attached to drug use. For this reason, we designed the Georgian GPS with the RRT innovation that provides a check on survey response validity and the completeness of the self-reports about drug use. To maintain comparability with GPS methods used in other countries, we chose to retain the standard GPS approach in surveys of drug use as conducted in EU countries, and to add the RRT approach at the end of the standard GPS survey session. In this way, the RRT approach was designed for minimal disruption of the standard GPS approach that had been used in prior surveys.

2. Material and methods

2.1. Study population and sampling

The sampling for this study was undertaken in August 2015 and the field data collection was done in November-December 2015. As approved by the cognizant committee for protection of human subjects (Institutional Review Board of the Health Research Union, Tbilisi, Georgia; IRB #00009520), according to guidelines of the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), and with a need to exclude minors under the age of 18 years, the target population for the Georgian survey included all 18-to-64-year-old household residents (EMCDDA, 2002). Exclusions were: non-citizens and transients; inability to read/write in the Georgian language; consent-impairing mental disabilities; residents of non-household residences and those of the Russia-occupied territories (i.e., Abkhazia and Samachablo).

The GPS sampling frame was derived from the Georgia 2014 General Population Census. Primary sampling units were geographic clusters in all accessible regions of Georgia (in total, 11 clusters, including capital Tbilisi). The number of sampling units for each cluster was defined by a Probability Proportional to Size approach. The secondary sampling units were administrative centers (main cities) and randomly selected rural entities (e.g., villages) from each region. The urban/rural proportion for the number of sampling units in each region was defined to be equal to 57.4%/42.6% based on 2014 Census data (Geostat, 2016). Kish tables were used to sampled designated respondents (DR) on household rosters; 18–34-year-olds were over-sampled.

A total of 4805 designated respondents participated, representing 95% of the sampled DR. Footnotes in the tabled results indicate non-response at the level of individual survey items. As for details about the above research approach, a total of 3650 addresses were enumerated, with 422 addresses excluded for legitimate reasons (e.g., abandoned, demolished, non-permanent units; unit-level refusals to participate), and 3228 participating dwelling units. Almost 100% of dwelling units participated after these exclusions. Probability sampling from rosters designated 5062 respondents, of whom 95% participated (2116 males; 2678 females, 11 unknown-missing data), with mean and median ages of 40 and 39 years, respectively.

2.2. Assessments

Standardized survey assessments involved trained field interviewers asking survey questions and recording answers on paper and pencil forms, with the exception of the RRT items, which were read silently by the participant. The standardized items were based on EMCDDA specifications, translated into Georgian language, with back-translation into English, as well as pilot-testing of the Georgian versions in focus groups for validation. After the standard GPS interview of 30–40 min duration, the RRT end-module (instruction + implementation) required an additional 5–7 min.

In this GPS application of the 'unrelated question RRT approach' described by Blair et al. (2015), each respondent received a Lari (Georgian currency) coin with heads ('Logo') and tails ('Number') for RRT randomization, along with a printed sheet showing two columns of Yes/No questions arranged in pairs, one question per column. There was a sensitive item in the 'Logo' column on that sheet (i.e., 'Logo' of the Lari coin), plus a non-sensitive item in the 'Number' column (i.e., 'Number' of the Lari coin). The respondent was told to flip the coin without showing the result to the interviewer, and to use the result of each coin toss to determine whether to answer the question in the "Logo" column (all of which were about drug use) or to answer the paired question in the "Number" column (all of which were about non-sensitive topics). The Georgia GPS RRT sheet is reproduced in Fig. 1.

Our RRT end-module offered six functional pairs of questions and required each respondent to toss the Lari coin six times, and to answer

Answer if HEAD	Answer if TAIL
RRT1. Have you ever taken hashish or marihuana yourself?	Have you completed University?
1 ☐ YES 2 ☐ NO	
RRT2. During the last 12 months, have you taken hashish or marihuana?	Are you married?
1 ☐ YES 2 ☐ NO	
RRT3. Have you ever taken new synthetic drugs yourself?	Where are you insured by state health care universal insurance last year?
1 ☐ YES 2 ☐ NO	
RRT4. Have you ever taken home-made stimulants yourself?	Are you employed?
1 ☐ YES 2 ☐ NO	
RRT5. Have you ever taken heroin yourself?	Are you a smoker?
1 ☐ YES 2 ☐ NO	
RRT6. Have you ever taken Subutex yourself?	Did you get new ID card last year?
1 ☐ YES 2 ☐ NO	

Fig. 1. RRT show card questions and design.