



Prescription tranquilizer/sedative misuse prevalence and correlates across age cohorts in the US



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HIGHLIGHTS

- We examined tranquilizer/sedative (T/S) misuse correlates across age cohorts.
- Young adults (18–25 years) had the highest past-year prevalence of T/S misuse.
- Mental health and substance use correlates were most robustly linked to T/S misuse.
- Factors had less robust links to T/S misuse in older adults versus younger groups.
- Suicidal ideation was reported by 21% of those endorsing T/S and opioid misuse.

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ABSTRACT

Background: Prescription tranquilizer/sedative (e.g., alprazolam, zolpidem) misuse (i.e., use in ways not intended by the prescriber or without a prescription) is understudied, with little research identifying misuse correlates. Identification of key correlates could identify subgroups more likely to engage in misuse, allowing for targeted treatment. This work examines tranquilizer/sedative use and misuse prevalence rates and misuse correlates across U.S. age cohorts, using nationally representative data.

Methods: Data were from the 2015–16 National Survey on Drug Use and Health ($n = 114,043$). Analyses used design-based logistic regression for past-year tranquilizer/sedative misuse correlates across participants or those engaged in past-year use; past-month misuse correlates were also examined in those with past-year misuse.

Results: Young adults (18–25 years) had the highest prevalence of past-year and past-month tranquilizer/sedative misuse, with 42.8% of those with past-year use also engaged in misuse. Mental health correlates were associated with past-year misuse, while substance use, particularly opioid misuse, was associated with both past-year and past-month misuse. Substance use correlate strength was most likely to vary by age group, with older adults (65 years and older) having fewer significant correlates overall.

Conclusions: This work highlighted young adults and those with other substance use as most likely to engage in tranquilizer/sedative misuse. In particular, those endorsing suicidality and reporting opioid misuse are a subgroup of concern, given their especially elevated rates of misuse and the increased risk for overdose imparted by tranquilizer/sedative medication. Workplace-based interventions for young adults and school-based universal prevention may be warranted to limit tranquilizer/sedative misuse in these groups.

1. Introduction

Prescription drug misuse (PDM) has received increasing attention recently, with commentators labelling PDM as an epidemic (Kanouse & Compton, 2015; Von Korff & Franklin, 2016). Much of the focus has

been on opioid PDM, given its outsized role in PDM prevalence and consequences, including overdose. As a result, prescription tranquilizer (i.e., primarily capturing benzodiazepine medication, such as alprazolam, used often for anxiety treatment) and sedative PDM (i.e., medications primarily indicated for insomnia, such as zolpidem) remains

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understudied (e.g., Maree, Marcum, Saghafi, Weiner, & Karp, 2016). In the US, tranquilizer/sedative use disorder treatment increased by 67% from 2003 to 2012 (SAMHSA, 2014), and adult fatal benzodiazepine overdose increased by over 400% from 1996 to 2013 (Bachhuber, Hennessy, Cunningham, & Starrels, 2016), with a nearly 300% increase due to benzodiazepine and opioid co-ingestion (Jones & McAninch, 2015). Data also indicate a 90% increase in US emergency department visits involving benzodiazepines from 2005 to 2011 (Day, 2014), with an increase of over 300% from benzodiazepine and opioid co-ingestion (Jones & McAninch, 2015).

Adolescent tranquilizer and sedative PDM is associated with poor psychosocial correlates, including major depression, poorer academic achievement, and problematic substance use (Hall, Howard, & McCabe, 2010; McCabe & West, 2014; Rigg & Ford, 2014; Schepis & Krishnan-Sarin, 2008). In adults, research on such misuse has occurred primarily in non-US samples (Fride Tvete, Bjorner, & Skomedal, 2015; McLarnon, Monaghan, Stewart, & Barrett, 2011; Nattala, Murthy, Thennarasu, & Cottler, 2014; Tahiri et al., 2017), with similarly concerning correlates.

Many aspects of tranquilizer/sedative PDM remain unexplored. No tranquilizer PDM research could be found comparing PDM and correlates across the lifespan in a US sample, with only one US study on zolpidem PDM (Schepis, 2014). Research evaluating tranquilizer/sedative PDM across the lifespan could have significant clinical utility, as characterization of older adults engaged in tranquilizer/sedative PDM could help prevent significant associated consequences (e.g., falls and fractures, neurocognitive impairments, and increased overdose risk; Airagnes, Pellissolo, Lavallee, Flament, & Limosin, 2016; Maree et al., 2016) by identifying those most likely to misuse. Identification of tranquilizer/sedative PDM correlates across age cohorts could establish whether correlates differ and require different foci by age, or are similar across ages, allowing for consistent prevention targets.

1.1. Aims

We aimed to fill these gaps in the literature through analyses of the 2015–16 National Survey on Drug Use and Health (NSDUH), with tranquilizer/sedative use and PDM combined, due to low sedative use/misuse prevalence and per previous research (Schepis & Hakes, 2013; Tetrault et al., 2008). First, we estimated the prevalence of lifetime and past-year tranquilizer/sedative use and PDM across six age groups: adolescents (12–17), young adults (18–25), and adults aged 26–34, 35–49, 50–64, and 65 and older. Second, we evaluated past-year tranquilizer/sedative misuse correlates across the population and in those engaged in any past-year tranquilizer/sedative use. Third, we examined past-month tranquilizer/sedative misuse correlates among those endorsing past-year misuse, with those 50 and older aggregated due to sample size concerns.

2. Methods

The NSDUH is an annual survey of substance use and associated behaviors in a representative sample of the US non-institutionalized population. It uses an independent, multistage area probability sample with population-based weights to provide nationally-representative estimates. All sensitive questions (e.g., those on PDM) were asked via audio computer-assisted self-interviewing (ACASI) to maximize honest reporting, with skip-outs and consistency checks to promote full responding and data consistency. More information on the NSDUH, including on psychometrics, is available elsewhere (CBHSQ, 2016, 2017; SAMHSA, 2010).

2.1. Participants

For 2015–16, 114,043 respondents were included in the NSDUH public use files. Females composed 51.3% of the sample, with Caucasians (63.5%), Hispanic/Latinos (16.4%) and African-Americans

(12.0%) comprising the three largest racial/ethnic groups (all weighted). For characteristics by age group, see online-only Supplemental Table A.

2.2. Measures

2.2.1. Primary outcomes

To aid recall, the NSDUH used trade and generic drug names and medication pictures, including Xanax®, Valium® or alprazolam for tranquilizers, and Ambien®, Lunesta® or zolpidem for sedatives. Initially, *lifetime tranquilizer/sedative use* and *past-year tranquilizer/sedative use* were assessed. Then, in those with lifetime but not past-year use, only *lifetime tranquilizer/sedative misuse* was assessed; in those with past-year tranquilizer/sedative use, *past-year tranquilizer/sedative misuse* was assessed instead. For both timeframes, this instruction is used: “The next question asks about using [drug class] in any way a doctor did not direct you to use them...including: Using it without a prescription of your own; Using it in greater amounts, more often, or longer than you were told to take it; Using it in any other way a doctor did not direct you to use it.” *Past-month tranquilizer/sedative misuse* was assessed among respondents who reported past-year tranquilizer/sedative misuse.

2.2.2. Age categories

Current age groups were restricted by the NSDUH public use file variables: the six-level CATAG6 variable was used for the first three tables (ages 12–17, 18–25, 26–34, 35–49, 50–64, and 65 and older) or the five-level CATAG3 variable for Table 4 (12–17, 18–25, 26–34, 35–49, and 50 and older).

2.2.3. Correlates

Correlate selection used previous PDM research, with greater attention to research assessing PDM by age cohort across the lifespan (e.g., Mowbray & Quinn, 2015; Schepis, 2014) and past work on tranquilizer/sedative misuse (e.g., Boyd, West, & McCabe, 2018; Rigg & Ford, 2014). Correlates were grouped into sociodemographics, physical health, mental health, and substance use.

Sociodemographics: *sex, ethnicity* (white versus non-white), *poverty status, metro area size, educational status or attainment* (currently in school/college graduate versus not in school/non-college graduate), and *religiosity*. Religiosity was a four-item variable used by Grucza et al. (2016) with good psychometrics ($\alpha > 0.9$ for 2015–16).

Physical health: *self-reported health* (poor versus fair to excellent), *overweight/obese body mass index* (BMI; ≥ 25), and *past-year hospitalization*.

Mental health: *past-year major depression, past-year mental health treatment, past-year serious psychological distress (SPD; adult only), past-year level of impairment from mental health symptoms* (adult only), and *past-year suicidal ideation* (adult only). Major depression was assessed based on the DSM-IV (American Psychiatric Association [APA], 2000), with good psychometrics (Zanarini & Frankenburg, 2001). SPD comes from the K6 assessment (Kessler et al., 2003) for the worst month in the past year. Scores ≥ 13 (of 24) are positive for SPD. Past-year mental health-related impairment comes from the World Health Organization's Disability Assessment Scale (WHODAS), a continuous 13-item assessment in the NSDUH (CBHSQ, 2016; Novak, Colpe, Barker, & Gfroerer, 2010). Suicidal ideation is queried by asking adults if in the past year “did you seriously think about trying to kill yourself?”

Substance use: *past-month binge drinking, past-year marijuana use, past-year prescription opioid use, past-year prescription stimulant use, past-year prescription opioid misuse, past-year prescription stimulant misuse, and past-year any DSM-IV substance use disorder (SUD) diagnosis*. Past-month binge drinking was an occasion (“at the same time or within a couple of hours”) of consuming 5/4 (men/women) or more alcoholic drinks. Prescription opioid or stimulant use and PDM were assessed via similar questions to those for tranquilizers/sedatives (above). Past-year SUD is

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