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Challenges in Quantifying Marijuana Use

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In clinical and research settings, self-report of substance use, in the form of daily diaries or the Time-Line Follow-Back method (1), is essential in monitoring baseline substance use and change over the course of treatment or research involvement. For alcohol and nicotine, completion of such self-reports is straightforward, with individuals reporting number of alcoholic beverages consumed and number of cigarettes smoked. Marijuana is more difficult to quantify for several reasons. It is consumed in a number of ways, including joints, blunts, pipes, bongs, and vaporizers, each potentially containing different amounts of marijuana per unit. Additionally, marijuana is very commonly shared, so that one joint may be divided between several people. Further complicating matters is the significant variation in potency of Δ^9-THC in marijuana. Our adolescent research participants advise us of a continuum of potency, varying from “schwag” (low potency) to “kine bud” or “sinsemilla” (high potency). This has also been reported in the literature, with concentrations of Δ^9-THC varying from 2% to more than 20% in smoked marijuana (2–4). While money spent on marijuana may be a reasonable proxy for potency, prices among dealers and geographic regions vary. Additionally, several marijuana smokers that we see do not purchase marijuana, instead sharing it with others who have made the purchase.

Previous published research reports have typically quantified marijuana use by number of joints smoked, number of smoking episodes per day, or by number of days (per week or month) of use. Methods for adjusting self-report measures to number of joints (e.g., converting from number of blunts or number of bong uses) have not been standardized among research and clinical groups. A more precise method may be necessary. We propose quantifying based on number of puffs (“hits”) taken. This allows users to more effectively quantify use of marijuana items that vary in size and may be shared with others. Puffs likely serve as a reliable standard of measure, since these increments convey similar psychoactive effects regardless of breathhold duration (5–8). In order to accommodate variations in potency, users may rate the relative potency of marijuana used on each occasion, with “0” representing average potency, “+1” more potent, “+2” most potent, “−1” less potent, and “−2” least potent. We propose multiplying number of puffs by 1.25 for +1 potency, 1.5 for +2, 0.75 for −1, and 0.5 for −2. This results in a quantity of marijuana use (“potency-adjusted puffs”) that may be tracked over time with an individual and may perhaps more accurately allow comparison between users. Please see Table 1 for examples from a sample of adolescent research participants. We welcome input from other research and clinical groups as we work to refine this method.

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Table 1

Conversion from participant-reported amount smoked to number of puffs.

Original Units Reported by Participant	User's Estimated Total Number of Puffs Per Unit	Number of People With Whom User Shared Marijuana	Potency Variation	Potency- Adjusted Number of Puffs
2 joints	10	3	+1	6.25
4 blunts	20	2	−1	30
1 bowl	12	0	0	12
2 bongs	12	2	+1	10
2 blunts	20	2	+2	20