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Engaging Youth (Adolescents and Young Adults) to Change Frequent Marijuana Use: Motivational Enhancement Therapy (MET) in Primary Care



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ABSTRACT

Purpose: To characterize information elicited from adolescent/young adults with frequent cannabis use in Motivational Enhancement Therapy (MET), and determine whether differences exist across stages of change (SOC) for reducing use.

Design and methods: Primary care patients 15–24 years old using cannabis ≥ 3 times/week enrolled in a pilot randomized intervention trial. All youth were offered two 1-hour MET sessions. Content analysis was used to code and categorize main reasons for use, alternative behaviors, goals, values, pros and cons of change, and compared results between youth in Pre-Contemplation vs. Contemplation SOC.

Results: Fifty-six youth completed MET session 1, 46 completed session 2. Most reported their main reason for use was related to emotional coping, negative feelings were a top-3 trigger, and distraction was an alternative way to meet their needs. Youth most frequently described progress in education or career/job as 1-year goals. More than half identified family as a very important value. They most frequently reported pros of using less related to achieving goals, self-improving, and saving money, and a con related to stress/coping. Compared to youth in Pre-Contemplation SOC, those in Contemplation were more likely to identify relationships as both a pro and con of using less cannabis.

Conclusions: MET can reveal developmentally appropriate goals, healthy values, and ambivalence about cannabis use that can be used to facilitate movement along the stages of behavior change toward reduction/cessation.

Practice implications: Brief motivational therapy can be used in primary care to gather information important in helping youth to reduce cannabis use.

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Cannabis is the most widely used illicit drug in the US and around world. Cannabis refers to the dried leaves, flowers, stems, and seeds from the hemp plant, *Cannabis sativa*, which contains the mind-altering chemical *delta-9-tetrahydrocannabinol* (THC) and other related compounds (<https://www.drugabuse.gov/drugs-abuse/marijuana>). Methods of use include oral ingestion, vaping, or smoking in rolled cigarettes (“joints”), water pipes (“bongs”), or hollowed-out cigars (“blunts”; Johnston et al., 2019). A recent national survey of adolescents ages 14–18 years revealed that smoking cannabis was the most frequent and consistent route of use (Knapp et al., 2019). The significant increase in the potency of cannabis over the past two decades (4% in 1995 to 12% in 2014) poses a higher risk for use among youth¹ (ElSohly et al., 2016)

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¹ The term *youth* is used to refer to adolescents and young adults.

The sociopolitical landscape and public discourse about cannabis has evolved over the past two decades; as of publication, 34 states plus the District of Columbia, Guam, Puerto Rico and US Virgin Islands have enacted laws for medical marijuana use and 9 states plus the District of Columbia have legalized small amounts of cannabis for adult recreational use (National Council of State Legislatures, 2019). Not unexpectedly, the perceived risk from regular cannabis use has declined precipitously among youth since the early 2000's, and recent trends reveal rising or plateaued rates of use, with one in seventeen 12th graders having reported daily cannabis use in 2018 (Johnston et al., 2019).

Adolescence is a critical developmental period with substantial neurocognitive and psychosocial growth and development that can be affected by cannabis use. Neuropsychological decline has been documented among adult cannabis users whose onset of cannabis use occurred in adolescence (Meier et al., 2012). Data from the National Surveys on Drug Use and Health revealed that both early-onset and adult-onset cannabis smokers had increased risk of a depressive episode compared to those

who never smoked (OR = 1.7 and 1.8, respectively, $p < 0.001$; Fairman & Anthony, 2012). It has been reported that adolescents who use cannabis daily are 2.5 times more likely to have an anxiety disorder, and adolescents with heavy cannabis use have increased rates of anxiety at age 29, even if they quit in young adulthood (Degenhardt et al., 2013). Initial use of cannabis in early adolescence and long term or heavy use have been strongly associated with addiction, altered brain development, poor educational outcome, cognitive impairment with lower IQ, and diminished life satisfaction, as well as an increased risk of anxiety and depression (Volkow, Baler, Compton, & Weiss, 2014). Evidence to date indicates that there are more harmful than therapeutic effects of recreational cannabis use on mental illness (Lowe, Sasiadek, Coles, & George, 2019). For adolescents who develop a cannabis use disorder, attempts to cut down or abstain may be thwarted by symptoms of cannabis withdrawal, including cognitive and functional issues as well as exacerbation of mental health problems, which in turn increase the risk of relapse (Allsop et al., 2012; Greene & Kelly, 2014).

There has been a marked shift in the self-reported reasons for cannabis use among 12th graders over the past four decades (1976–2016), with earlier reasons reported as social/recreational (i.e., boredom, feel good/get high, experiment, fit in) and more recent reasons described as coping-related (i.e., anger/frustration, escape problems, relax, get through day; Patrick, Evans-Polce, Kloska, & Maggs, 2019). Understanding adolescents' motivations for cannabis use are particularly important for motivation-based approaches for prevention and intervention (Dash & Anderson, 2015).

SBIRT (Screening, Brief Intervention and Referral to Treatment) is an evidence-based method of identifying and intervening with individuals who engage in high-risk alcohol and/or drug use and has been outlined as an integral part of nursing practice (Finnell et al., 2014). Motivational Interviewing (MI) is typically the "BI" component of SBIRT and has been endorsed by the American Academy of Pediatrics (Levy & Kokotailo, 2011). MI has been defined by Miller and Rollnick (2013) as:

...a collaborative, goal-oriented style of communication with particular attention to the language of change. It is designed to strengthen the personal motivation for and commitment to a specific goal by eliciting and exploring the person's own reasons for change within an atmosphere of acceptance and compassion. (p. 29)

MI is cognitively based, requiring some formal or abstract reasoning ability, and is an approach that works well with adolescents and young adults (Naar-King & Suarez, 2011). There are four central components to the underlying *Spirit of MI*: *Acceptance* – counselor communicates absolute worth, accurate empathy, affirmation, and autonomy support for the individual; *Compassion* – counselor acts benevolently to promote the individual's welfare, giving priority to the client's needs; *Evocation* – counselor elicits the individual's own perspectives and motivation; and *Collaboration* – the counselor functions as a partner, collaborating with the patient's own expertise (Miller & Rollnick, 2013). A systematic review of research aimed to reduce adolescents' use of illicit drugs found that MI can influence their intentions to change, although MI may not result in reduced use (Li, Zhu, Tse, Tse, & Wong, 2016). Motivational Enhancement Therapy (MET), combines MI with structured personalized feedback, and is a promising intervention for adolescents with problematic substance use (Blevins, Walker, Stephens, Banes, & Roffman, 2018; Cornelius et al., 2011; Dennis et al., 2004; Jensen et al., 2011). However, some researchers have noted the lack of strong and consistent effects for MET when compared to alternative brief interventions (Davis, Houck, Rowell, Benson, & Smith, 2016; Walker et al., 2011). A meta-analysis of randomized controlled trials (RCTs) of MET studies ($n = 25$) that included both youth and adults who used a variety of substances (alcohol, cannabis, nicotine, and multiple) found a small-to-medium treatment effect for MET when compared with no treatment and a small effect for MET when compared with alternative treatments (Lenz, Rosenbaum, & Sheperis, 2016).

Providers of MI/MET interventions recognize that different individuals are at different places in the process of behavior change. The Transtheoretical Model of Behavior Change (Prochaska, DiClemente, & Norcross, 1992) provides a framework for identifying an individual's stage of behavior change, which informs immediate treatment goals (i.e., movement to the next stage) and points to stage-matched MI/MET strategies and skills for eliciting the individual's motivation to change. The Stages of Change include Pre-contemplation (not thinking about behavior change), Contemplation (considering change, but ambivalent), Determination or Preparation (committed to change in the near future), Action (taking steps to change), and Maintenance (have made the change and are working on sustaining it).

The authors of this article collaborated on an overarching study to trial the feasibility and preliminary efficacy of MOMENT (Momentary Self-Monitoring and Feedback + Motivational Enhancement Therapy) – a counseling-plus-Ecological Momentary Intervention (EMI) to reduce frequent marijuana use among youth being seen in primary care (Shrier et al., 2018). A key part of that intervention study was providing two MET sessions for all participants prior to different procedures according to random assignment to one of three study arms: mobile self-monitoring with feedback messages; mobile self-monitoring alone (no messages); or no further treatment (MET-only). In this article we discuss the findings from the MET sessions, characterizing aspects of participants' relationship with cannabis use, including main reasons for using cannabis, alternative behaviors, personal values and goals, and pros and cons of behavior change. We also compared these cannabis use characteristics by Pre-contemplation vs. Contemplation stage of change.

Methods

Adolescent clinic patients in an urban children's hospital in the northeastern United States 15–24 years old who used cannabis frequently (defined as 3 or more times per week) were enrolled in a pilot randomized controlled trial of the MOMENT intervention, which includes 2 MET sessions, delivered in person, followed by self-monitoring and responsive messaging delivered via smartphone. The study was approved by the hospital institutional review board with a waiver of parental permission, and a Certificate of Confidentiality was obtained from the National Institute on Drug Abuse. Drug testing was not used to validate participants' self-reported marijuana use, owing to cost constraints. Youth were recruited during visits for routine care with their primary care provider, via contact by study staff if they had previously indicated interest in clinic research, or self-referred. Study participants received remuneration in the form of gift cards (up to \$175, depending on completion of study activities). Screening of referred individuals and obtaining informed consent was completed by trained study staff. A total of 319 individuals were referred for screening, 191 (59.9%) completed screening, of which 139 (73%) were eligible to participate in the study; 70 eligible youth (50%) were enrolled.

Following a baseline survey and one week of momentary and daily self-reports, all participants were asked to return for two MET sessions. Fifty-six participants (80%) returned for MET Session 1 and 46 (82%) returned for MET Session 2. The two in-person MET sessions each lasted approximately 60–75 min, during which time the counselor met with the participant one-on-one. The first MET session took place about one week after the baseline study visit and the second MET session was arranged for 1–2 weeks later. Two counselors (practicing Advanced Practice Nurses in pediatrics) were trained in MI by one of the investigators (P.J.B.), a nurse practitioner and a member of MINT (Motivational Interviewing Network of Trainers). MET counselors used a detailed intervention manual developed for this study for consistent intervention delivery (see Table 1).

The goal of the first MET session was to establish rapport and engage the participant in a conversation using MI. During this session, the counselor explored the participant's future goals (1-year and 5-year), history

Table 1
MET activities by session.

MET Session 1	MET Session 2
Establish rapport & recall purpose of the study	Re-establish rapport
Review goals of session 1	Remind about conditional confidentiality and audiotaping
Review conditional confidentiality	Review session 1
Remind that session is audiotaped	Discuss Personalized Feedback Report
Build rapport	Report
Discuss goals in life, 5 years, 1 year	Assess stage of change using Readiness for Change Wheel
Discuss participants marijuana use history, behaviors, reasons, expectancies	Assess importance of change using Importance Ruler
Briefly asses for other substance use	Assess level of confidence using Confidence Ruler
Identify triggers for use using triggers list	Complete Change Plan
Identify pros/cons of using less marijuana using Decisional Balance Scale exercise	Worksheet
Identify Values using Value Card Sort activity	Summarize session 2
Summarize session 1 and preview session 2	



Fig. 1. Decisional balance activity.

of cannabis use (onset, frequency, main reasons and expectations for use), other ways they could get what they need, triggers for use (organized under 4 categories *Places I am in, People I am with, Feelings, and Activities* and top 3 triggers selected by participant), perceived pros vs. cons of “using less marijuana” (decisional balance activity using a scale, colored markers, and popsicle sticks, pictured in Fig. 1), and personal values (value cards for a Q-sort²).

The goal of the second MET session was to provide a personalized feedback report, to elicit the participant's ratings of readiness, importance, and confidence for making a change and to develop a change plan. During this session, the counselor reviewed a written report on the participant's cannabis use based upon self-reports (from baseline surveys and the first MET session). Participants were shown a readiness wheel with descriptions of each of the five Stages of Change and asked to select the statement that best described where they were at in terms of being ready to reduce their use of cannabis. They were then shown a ruler for both importance of and confidence in making a change in their cannabis use and were asked to identify a numerical rating (0–9). Finally, the counselor guided youth as they wrote out their change plan in response to the following questions: *what change(s) do you want to make (e.g., cut down or quit using cannabis)?; why do you want to make these changes?; what action steps will you take and when do you want to start?; what are ways that other people can help you?; how will you know if your plan is working?; what might be some possible obstacles and how would you respond?; and what would you do if your plan is not working?*

All of the MET sessions were audiorecorded for treatment fidelity and MET counselor coaching. During each session, the counselor took notes on a computer tablet form developed specifically for this study to capture participants' responses to open-ended questions. After each session the study participant and counselor independently completed a counselor evaluation adapted from the *Behaviour Change Counselling Index (BECCI; Lane et al., 2005)*. To ensure fidelity we applied strategies developed by the Treatment Fidelity Workgroup of the Behavior Change Consortium (BCC; *Bellg et al., 2004*), including (1) developing and using a detailed intervention manual; (2) providing the MET counselors with comprehensive training on administration of the intervention; and (3) the MI trainer coding approximately 20% of the MET sessions using both the *BECCI* and the *Motivational Interviewing Treatment*

² The Values Q-Sort is a projective technique aimed at developing discrepancy between a person's behavior and their personal values. Participants were given a deck of 27 cards describing Personal Values which we explained were “things that you think guide you as you live your life” (e.g., FAMILY- *To have a happy, loving family*; RESPONSIBILITY - *To make and carry out reasonable decisions*). The youth were asked to sort these into 3 piles: *Important to Me, Very Important to Me, or Not Important to Me*. Next they were asked to look at the cards in the *Very Important to Me* pile and select their top 3 values, after which the counselor engaged them in a conversation about how cannabis use might be interfering with their personal values.

Integrity (MITI 3.1.1 followed by the revised 4.0) Code Manual according to a pre-determined plan (i.e., the first three participants, then every three months during year one, and every 6 months thereafter). Both the trainer and the counselor independently completed the BECCI for the identified MET sessions, and the trainer completed the MITI. The trainer and counselor then met for 1 h of feedback and coaching.

Data analysis

Three researchers (P.J.B., S.P., C.J.) independently reviewed the counselor's MET session notes to initiate coding the qualitative data (i.e., responses to open ended questions) and to identify appropriate categories for summarizing responses to those questions about the main reasons for cannabis use, alternatives for meeting needs, personal goals for one year from now, values, and pros and cons of reducing cannabis use. The researchers then met multiple times to discuss codes and categories using a conventional content analysis approach to reach consensus on the final categories (shown in *Tables 2–5; Hsieh & Shannon, 2005*). Descriptive statistics were used to summarize demographic characteristics and categories for the participants' responses. Chi-square tests were used to compare reasons for use, goals, values, and pros and cons of change between youth in the Pre-contemplation vs. Contemplation stage of change. Although at baseline screening all participants reported using cannabis at least 3 times a week on average, by the time of the second MET session, some participants were preparing to discontinue cannabis use (Determination/Preparation) or had already ceased to use (Action or Maintenance); we grouped those three stages of change and labeled them as “Post-contemplation.”

Table 2
Sample demographic characteristics and cannabis use history (N = 56).

Characteristic	Mean (\pm SD), range or Median (IQR)	N (%)
Age, years	20.2(\pm 1.9), 15–24	
Age <21 years		32 (57%)
Sex		
Female		34 (61%)
Male		22 (39%)
Race/ethnicity		
White non-Hispanic		8 (14%)
Black non-Hispanic		26 (46%)
Asian, other race, or multi-race		5 (9%)
Hispanic		17 (30%)
Age first cannabis use, years	14.9(\pm 3.0), 3–21	
Duration of cannabis use, years	5.3(\pm 2.8), 1–12	
Current cannabis use frequency, times per week on average	9.5(5–20.75)	

Table 3
Main reasons for use (MET Session 1, N = 56).

Categories from content analysis	n (%)
Emotional coping (e.g., stress relief, calm down, avoidance)	38 (68%)
Pleasure (e.g., feeling high, like it)	20 (36%)
Relaxation	18 (32%)
Socialization	17 (30%)
Physical enhancers (e.g., appetite, sleeping)	15 (27%)
Cognitive enhancers (e.g., creativity, focus better)	14 (25%)
Boredom/habit	8 (14%)

Note. In response to this open ended question, participants could identify as many reasons as they desired.

Participants rated the overall quality of the MET sessions as excellent or good (MET 1, 93%; MET 2, 94%). As part of the fidelity plan, the MI trainer coded MET sessions for 12/56 (21%) participants using both the BECCI and the *Motivational Interviewing Treatment Integrity* (MITI 3.1.1 followed by the revised 4.0) Code Manual, and then met with each counselor to discuss the coded sessions. For both counselor and trainer assessments, median scores on the BECCI items were all at least 3, consistent with competent MI counseling (Shrier et al., 2018).

Results

The sample had a mean age of 20.7 years-old (SD 1.9), included 28 females (61%) and 18 males (39%), and was 63% African American and 35% Hispanic (see Table 2). Participants reported first cannabis use at a mean age of 15 years (SD 3.0), had been using for a mean of 5 years (SD 2.7), and were using cannabis 15 times per week, on average (SD 15.2; range 1–80).

Participants most frequently reported that their main reason for use was emotional coping (68%; Table 3). Three out of four participants (75%) indicated alternatives to cannabis use that involved distraction or keeping busy (Table 4). Participants' top-3 triggers were distributed across the four categories of places, people, feelings, and activities. Most of the participants (82%) chose at least one negative feeling as a top-3 trigger for using cannabis.

Table 4
Other ways to get what I need (MET Session 1, N = 56).

Categories from content analysis	n (%)
Distraction/keep busy	43 (75%)
Physical activities	27 (48%)
Self-care	26 (46%)
Socialize	25 (45%)
Change lifestyle	18 (32%)
Other substances (e.g. cigarettes)	8 (14)

Note. Participants were asked about other ways to get what they need instead of using cannabis. In response to this open ended question, participants could offer multiple alternatives.

Table 5
Personal goals 1 year from now (MET Session 1, N = 56).

Categories from content analysis	n (%)
Progress in education	37 (66%)
Progress in job or career	27 (48%)
Gain independence	25 (45%)
Personal growth	9 (16%)
Positive relationship choices	8 (14%)
Quit cigarettes or marijuana	4 (7%)
Figure out goals	4 (7%)
Recreation	3 (5%)

Note. In response to this open ended question, participants could offer more than one goal.

Table 6
Pros and cons of using less cannabis (MET Session 1, N = 56).

Pros of using less MJ	n (%)	Cons of using less MJ	n (%)
Work toward goals	45 (80%)	Stress and coping	40 (71%)
Self-improvement	37 (66%)	Lose positive aspects of using	22 (39%)
Save money	29 (52%)	Negative impact on relationships	19 (34%)
Improve relationships	21 (38%)	Physical complaints	18 (32%)
Avoid drug lifestyle	11 (20%)	Increased use of other substances	4 (7%)

Note. Pros and cons of using less cannabis were discussed during the decisional balance activity in which participants could identify as many or as few as they desired.

Personal short-term goals (i.e., one year from now) were coded into eight categories (Table 4); goals most frequently fell into the categories of Progress in Education (66%), Progress in Job or Career (48%), or to Gain Independence (45%). During the Values Q-Sort activity, more than half of the youth (55%) chose Family as *Very Important to Me*.

The decisional balance exercise eliciting participants' pros and cons of using less cannabis resulted in responses that were coded into five categories (Table 5). Most participants indicated pros for using less cannabis that were categorized as Work Toward Goals (80%), Self-improvement (66%), and Save Money (52%; Table 6). More than two thirds of the participants (71%) indicated cons for using less cannabis as related to Stress and Coping, reflecting their concern that cutting down on their cannabis use could adversely affect their ability to cope with stress or other negative feelings. Additional cons focused on social issues such as losing the positive aspects of using cannabis (39%) and negative impact on relationships (34%). There was also concern about physical complaints (32%) such as issues related to sleep or appetite.

Table 7 summarizes participants' self-reported stage of change for reducing their use of cannabis. Participants were nearly evenly distributed across Pre-contemplation (35%), Contemplation (35%), and Post-contemplation (30%). Compared to those in Pre-contemplation, participants in Contemplation were more likely to report a Pro for using less cannabis in the category of To Improve Relationships (62.5% vs. 6.3%, $X^2 = 11.221, p = 0.001$) and a Con for using less cannabis in the category of Negative Impact on Relationships (62.5% vs. 25%, $X^2 = 4.571, p = 0.033$). Reasons, alternatives, goals, and values did not differ between participants in Pre-contemplation and those in Contemplation.

Discussion

Cannabis use during adolescence is a significant public health concern, with deleterious effects described across physical, social and psychological domains in individuals who begin to use cannabis during this critical life stage, particularly if the use is frequent (Meier et al., 2012; Volkow, Baler, Compton, & Weiss, 2014). Leading pediatric health care organizations have strongly recommended the development of evidence-based approaches to engage youth in conversations about their cannabis use, to identify those with use disorders and to refer them to treatment (American Academy of Child and Adolescent

Table 7
Stage of change for reducing use of cannabis (MET Session 2, N = 46).

Statement	Stage of change	n (%)
Nothing bad is happening in my life because of my marijuana use, so I don't need to try to use less	Pre-contemplation	16 (35%)
I think that my life would be better if I used less marijuana and I am thinking about reducing my use soon	Contemplation	16 (35%)
	Post-contemplation	14 (30%)
I know ways to reduce my use of marijuana and plan on using much less very soon	Determination	10 (22%)
Within the past 6 months, I have started doing everything I can to use less marijuana	Action	3 (6%)
I have consistently used less marijuana for >6 months and am trying to keep it that way	Maintenance	1 (2%)

Psychiatry, 2017; American Academy of Pediatrics, 2015). Although research to date has been mixed in regard to long term outcomes associated with MET, in general the use of MET has been described as an effective strategy for intervening with youth to help them reduce their substance use (Blevins et al., 2018; Dennis et al., 2004; Jensen et al., 2011; Walker et al., 2011).

In the context of the *Spirit* of MI, adolescents and young adults were forthcoming with their cannabis use history, reasons for use, and barriers and facilitators of change in their lives. The large majority (82%) of those who completed the first MET session returned for the second session and rated the overall quality of the sessions as excellent or good (Shrier et al., 2018). These findings highlight the acceptability of MET as a primary care treatment modality for this population and as a counseling approach for partnering with youth as they strive to achieve their goals.

Youth in this study were future-oriented with developmentally appropriate goals focused on educational and career advancement and increased autonomy. These findings are consistent with Self-Determination Theory (SDT), which postulates that people have a propensity toward personal growth; MI elicits motivation for change that aligns with that drive for growth (Markland, Ryan, Tobin, & Rollnick, 2005). By asking youth how their cannabis use aligns with their goals, clinicians can develop discrepancy and elicit motivations to change.

Distraction was reported as the primary alternative method for youth to get what they needed by means other than using cannabis. Given that family ranked highly among youth's values and the youth articulated personal goals for advancement in education and career, providers can play a key role in helping young people to acknowledge what is important to them, and to develop alternative strategies aligned with their personal values and goals, e.g., planning for their next career step, studying for placement tests, preparing applications for schools of higher education, or exploring opportunities to connect with family members.

Reducing or ceasing heavy cannabis use can be challenging for adolescents and young adults, whose affective states are closely tied to their cannabis use (Ross, Brooks, Aschengrau, Siegel, & Weinberg, 2018; Shrier, Ross, & Blood, 2014). Youth in this study commonly cited negative emotions as a trigger for use (82%) and coping with those emotional states was a reason for use in the majority of participants (68%), consistent with other research showing time-trend increases in negative affective states as reasons for use in this population (Patrick et al., 2019). For youth who meet criteria for Cannabis use disorder, attempts to cut down can trigger withdrawal symptoms that youth may falsely attribute to situational triggers. Thus cannabis use may be related to self-medication to cope with mood or attentional issues, with prolonged frequent or heavy use increasing risks to mental health (Gobbi et al., 2019). Within the context of rising rates of mental health disturbances among adolescents and young adults (Mojtabai, Olfson, & Han, 2016), antecedents and correlates of substance use are of particular interest in examining best ways to address these concerns. Although cannabis may provide short-term relief of anxiety and depressive symptoms (Metrik, Kahler, McGeary, Monti, & Rohsenow, 2011; Ross et al., 2018), there may be general increase in anxiety for individuals who use long-term (Buckner et al., 2014). For this reason, focus on addressing youth's mental health and facilitating development of effective coping strategies are key in developing meaningful change in cannabis use for this population.

As expected for this intervention trial, the majority of individuals in this study were in the Pre-contemplation or Contemplation stage of change (total of 70% between the two groups). For those contemplating reducing or quitting cannabis use, relationships were an important consideration in their decisional balance. Youth in Contemplation highlighted the ambivalence that is a hallmark of this stage in that relationships were both a pro and a con for reducing their cannabis use. Clinicians need to understand the complex role of relationships in facilitating or impeding change and look for ways to “tip the balance”

toward change by helping youth who use cannabis frequently to consider how they will manage their relationships as they make changes to their use.

This study has both limitations and strengths. The convenience sample was drawn from clinics affiliated with a single urban children's hospital in the Northeast, which limits the generalizability of the findings. However, in contrast to much of the extant substance use research with adolescents and young adults, this study recruited non-treatment seeking patients from primary care clinics and the majority (61%) of the participants were female. While self-report is a typical method for studying substance use, and participants' responses were protected by confidentiality, we acknowledge the risk of information bias (social desirability) among our adolescent and young adult participants. We did not examine associations of information obtained during the MET counseling, such as types of Pros/Cons for change and stage of change, with subsequent reduction or cessation of cannabis use.

Implications for practice

Providers in primary care settings are tasked with the challenge of screening for substance use, providing brief interventions, and referring to treatment those youth with problem use. However, resources for providers tend to focus more on screening measures, and less so on engaging youth in conversations to reduce use or about seeking appropriate treatment (Ozechowski, Becker, & Houge, 2016). This study highlights a useful approach for practitioners in primary care settings that was acceptable to the youth in this study. Of note, despite frequent and problematic cannabis use, none of our participants were interested in a referral to an adolescent substance abuse program. The manualized MET sessions provided structure and guidance for conversations around substance use that can be challenging for providers and patients. Training and support for providers in primary care practices and school-based health centers is vital, as these clinicians may provide the first opportunity to receive substance use treatment for youth with frequent cannabis use.

Implications for future research

The setting for the current study was hospital-based clinics. Future research evaluating the use of MET with youth who are frequent users of cannabis could expand to other community sites such as School Based Health Centers (SBHCs) and Community Health Centers. Our study population was urban and thus further research is needed with rural populations. Relationship issues were a focal point for youth when considering the pros and cons of cutting down on their use of cannabis, therefore more studies are needed to explore the impact of cannabis use on interpersonal relationships with peers, parents, and other family members, particularly siblings. Considering the role that cannabis played as a means for coping with emotional stress, it would be interesting to explore the use of mind-body techniques such as mindfulness as alternative form of coping.

Implications for policy

This study highlights the ways in which youth interact with cannabis, their reasons for use, and their challenges in reducing or quitting. Considering the fact that two-thirds indicated that their main reason for using cannabis was for emotional coping, programs are needed to help youth develop positive coping strategies. Schools play a critical role in mental health promotion. Boards of Health and Education should join together to mandate substance use education, reflecting the current evidence base indicating risks associated with both early initiation and heavy use. We need to ensure that all youth are receiving mental health screening and referral to treatment, along with ready access to mental health services. Integrating behavioral health into primary care is one means for addressing this urgent mental health need. Many of the

youth reported using distractions - finding something else to do - as a way to avoid using cannabis. This suggests an opportunity for creating work experiences or volunteer opportunities in the community for youth to promote their autonomy and teach them skills that can help them become more independent.

Further decriminalization and other social and legal policies are needed to reduce stigma around seeking treatment and avoid negative impact of detention/incarceration and/or hefty fines for cannabis use on youth who likely have normative, pro-social goals like education, work, and relationships. Communities need stringent restrictions and rules for recreational cannabis advertising and sales to minimize the appeal and access for youth.

Conclusion

MI/MET offers clinicians caring for adolescents and young adults an evidence-based counseling approach for communicating about cannabis use. MI/MET conversations may reveal developmentally appropriate goals, healthy values, and ambivalence about cannabis use that can be used to facilitate movement along the stages of behavior change toward decreased or discontinued use.

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CRedit authorship contribution statement

Meredith Kells: Investigation, Resources, Formal analysis, Writing - original draft, Writing - review & editing, Visualization. **Pamela J. Burke:** Conceptualization, Methodology, Formal analysis, Resources, Data curation, Writing - original draft, Writing - review & editing, Visualization, Supervision. **Sarah Parker:** Data curation, Formal analysis. **Cassandra Jonestrask:** Data curation, Formal analysis, Project administration. **Lydia A. Shrier:** Conceptualization, Methodology, Software, Formal analysis, Resources, Data curation, Writing - original draft, Writing - review & editing, Visualization, Supervision, Project administration, Funding acquisition.

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