



Adaptation of the Drug and Drug Problems Perception Questionnaire to assess healthcare provider attitudes toward adolescent substance use

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ABSTRACT

Although preventive screening, brief intervention and referral to treatment for adolescent substance use is recommended by the American Academy of Pediatrics, primary care providers inconsistently address substance use with their pediatric patients (AAP Committee on Practice and Ambulatory Medicine and AAP Bright Futures Periodicity Schedule Workgroup, 2017). Further research on provider perceptions about addressing adolescent substance use may help identify and address some barriers to screening. However, there are few validated measures of provider perceptions toward patient substance, and none are specific to pediatric patients. This study (conducted in Maryland, 2015–2017) examines the internal consistency and factor structure of an adapted measure to assess perceptions of adolescent substance use. Internal consistency was assessed using responses from a sample of 276 healthcare practitioners (87.7% women, 12.3% men). Their professions included the following: Certified Medical Assistants (10.9%), Registered Nurses (17.8%), Nurse Practitioners (8.3%), Physician Assistants (3.6%), Medical Doctors (13.8%), Clinical Therapists (10.9%) and Other (21.0%). A four-factor solution was identified and initial evidence suggests the adapted measure is appropriate for use with health care providers. A subsample of 181 participants who reported direct interaction with adolescent patients in a provider role was also used to assess convergent validity with self-reported screening practices and effectiveness. Provider-reported frequency of alcohol and drug use assessment for pediatric patients was significantly related to positive perceptions about adolescent substance use on all subscales. The adapted measure could prove useful for assessing provider readiness to receive adolescent substance use screening training and could be further adapted to include items unique to adolescent care, including parental involvement.

1. Introduction

In 2016, the *Surgeon General's Report on Alcohol, Drugs, and Health* identified addiction as a public health crisis (Albery et al., 2003). As of 2014, approximately 21.5 million people in the United States met criteria for a substance use disorder (SUD), including 1.3 million adolescents (Cabana et al., 1999). Most individuals meeting SUD criteria began using substances during adolescence and met criteria by ages 20–25 (Cartwright, 1980; Center for Behavioral Health Statistics and Quality, 2015; Compton et al., 2007). About 1 in 20 adolescents have a SUD but < 10% receive specialty SUD treatment (Cabana et al., 1999).

The American Academy of Pediatrics (AAP) recommends routine screening for adolescent substance use in primary care settings to promote early identification, increase treatment referral, and prevent later substance misuse and disorders (AAP Committee on Practice and Ambulatory Medicine and AAP Bright Futures Periodicity Schedule Workgroup, 2017; Costello and Osborne, 2005). However, fewer than 50% of primary care providers who treat adolescents use a validated tool

to screen for tobacco, alcohol, and other drugs (Damschroder and Hagedorn, 2011; De Winter and Dodou, 2012; Gordon et al., 2011). Furthermore, health care providers (hereafter, providers) who rely on clinical impression alone significantly underestimate substance use by adolescents: in one study, providers correctly identified 14% of adolescents with serious problems and did not correctly identify any adolescents who met criteria for dependence (Gorman and Cartwright, 1991).

Multiple barriers prevent providers from consistently implementing clinical guidelines including substance use screening (Hallfors and Van Dorn, 2002), limited time (De Winter and Dodou, 2012), competing medical problems, provider hesitance to screen when treatment resources are limited, lack of training and thus limited knowledge of screening tools and their uses (De Winter and Dodou, 2012; Harris et al., 2012a; Harris et al., 2012b; Hasin et al., 2007).

There is relatively less literature on provider attitudes about adolescent substance use and perceptions about their role addressing behavioral health concerns, despite substantial theoretical and empirical rationale linking attitudes and behaviors. For instance, the Theory of

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¹ Note: Dr. McKenzie started this research while at the University of Maryland but finished while at New York-Presbyterian.

Planned Behavior and Roger's Diffusion of Innovation emphasize the importance of provider perceptions, self-efficacy and attitudes in the implementation of any new or different practice (Ajzen, 1991; Holt et al., 2010; Kessler et al., 2005; Levy et al., 2017). Attitudes toward implementing a specific practice are often considered a key determinant of practice underlying provider engagement in training and actual practice change (Gordon et al., 2011; Hallfors and Van Dorn, 2002). To our knowledge, there are no validated, provider-report measures that assess attitudes toward adolescent substance use.

The current study examines the factor structure and convergent validity of a measure adapted to assess provider perspectives about adolescents substance use. The Alcohol and Alcohol Problems Perception Questionnaire (AAPPQ), and its later version for drug use, the Drug and Drug Problems Perceptions Questionnaire (DDPPQ) was identified by our study team as the most amenable to adaptation for adolescents for several reasons. First, the AAPPQ and DDPPQ demonstrated strong internal consistency (LIGHTFOOT and Orford, 1986). Second, items and factors of the AAPPQ/DDPPQ directly address the providers' personal feelings of satisfaction and competence when working with patients who use substances. Third, these scales are used amidst early-intervention screening, treatment and referral programs in substance use (Marshall et al., 2012). The AAPPQ and the DDPPQ were developed to assess provider perceptions toward patient substance use concerns with the specific aim of identifying therapeutic factors believed to impact treatment outcomes in adults as demonstrated by Fig. 1 (Miller et al., 2005).

The five original AAPPQ factors are Work Motivation, Work Satisfaction, Role Adequacy, Role Legitimacy, and Self-Esteem (LIGHTFOOT and Orford, 1986; Millstein and Marcell, 2003). Gorman & Cartwright (1991) proposed that negative attitudes about individuals who use substances stem from low role security on the part of the provider. They also emphasized the positive impact of the provider's "therapeutic commitment" (i.e., work motivation, satisfaction and self-efficacy) on treatment outcomes. The original version was amended to include three items related to provider feelings of collegial support, creating a sixth factor and a total of 30 items (Role Support) (Marshall et al., 2012). Although the AAPPQ is a commonly used scale with acceptable reliability, there were several factor structure inconsistencies; previous research refers to five, six and seven factor solutions (Marshall et al., 2012). In 2003, the AAPPQ was modified and combined with the Alcohol Problems Occupationally Perceived Questionnaire (APOPPQ) (Murphy et al., 2000) to create the 41-item DDPPQ (Ondersma et al., 2007). Due to poor loading of multiple AAPPQ items when wording was changed to apply to illicit drug use, a new factor analysis was conducted (Ondersma et al., 2007; Osborne et al., 2008). The resulting DDPPQ was comprised of 22 items (8 items were removed due to alpha values below 0.7) but retained the same six factor structure (Osborne et al., 2008). As the Watson et al. (2003) research appears to be the most rigorous psychometric validation of the blended version of the AAPPQ and DDPPQ, we used this 22-item measure as the basis of our adaptation for adolescents.

1.1. Purpose

The current study discusses the development of the Adolescent

Substance Use Problems Perceptions Questionnaire (ASUPPQ) and examines its underlying factor structure. We also examined convergent validity of ASUPPQ subscales by exploring their association with specific provider behaviors, such as self-reported frequency of adolescent substance use assessment and provider self-efficacy in working with adolescents with substance problems.

2. Method

2.1. Participants

The sample consisted of 276 healthcare practitioners in 15 Maryland counties who participated in SBIRT training for adolescent substance use. Participants were 87.7% women, 12.3% men and represented a range of healthcare professionals, including Certified Medical Assistants (10.9%), Registered Nurses (17.8%), Nurse Practitioners (8.3%), Physician Assistants (3.6%), Medical Doctors/Doctors of Osteopathy (13.8%), Clinical Therapists (10.9%) and Other (21.0%). Thirty-eight (13.7%) participants did not report an occupation. For convergent validity analyses with self-reported screening practices and effectiveness, participants who did not directly interact with adolescents in a provider role were excluded. This subset of participants included 181 individuals (82.8% women, 17.2% men) who were Registered Nurses (26.1%), Nurse Practitioners (13.3%), Physician Assistants (6.1%), Medical Doctors/Doctors of Osteopathy (19.9%), Clinical Therapists (18.2%), and Other Professionals (11.0%).

2.2. Procedures

The development of the ASUPPQ was conducted in the context of a statewide implementation of adolescent SBIRT training. The SBIRT model of identification (i.e., screening) and intervention (i.e., brief intervention, referral to treatment) is recommended by the U.S. Preventative Health Task Force and endorsed by the AAP. SBIRT emphasizes the use of standardized screeners, such as CRAFFT or Screening to Brief Intervention Tool (S2BI), as they significantly improve detection of problem substance use as compared to clinical impression (AAP Committee on Practice and Ambulatory Medicine and AAP Bright Futures Periodicity Schedule Workgroup, 2017; De Winter and Dodou, 2012; Ozer et al., 2005). SBIRT trainings provided a logical setting to collect data about providers' perceptions of adolescent substance use and screening practices.

The Maryland SBIRT training was conducted by Mosaic Group, a Baltimore-based management-consulting firm that specializes in community health and human-services strategies (www.groupmosaic.com). Mosaic Group trained professionals in school- and community-based healthcare centers. Healthcare centers required medical providers who work with pediatric patients to participate in SBIRT training for adolescent substance use. Trainings occurred on a rolling basis based on site availability. SBIRT training was part of a larger implementation process to fully integrate SBIRT into each practice site.

A packet of self-report measures was distributed and collected before each training as part of the quality improvement process and



Fig. 1. Primary care provider attitudes' influence on treatment outcomes.

training program evaluation. Completion of the measures was voluntary and confidential. This study was approved by our Institutional Review Board as non-human subjects research as part of a program evaluation to inform quality improvement, so written consent was not collected.

2.3. Measures

The Adolescent Substance Use Problems Perceptions Questionnaire (ASUPPQ) is an 22-item measure² adapted from the DDPPQ. Adaptations were minor and efforts were made to not substantially change item wording. The word “drug” was changed to “alcohol and substance” to be more inclusive of both, and the words “drug users” were changed to “adolescents who drink alcohol/use drugs” to reflect person-first language. Also, the study team (including mental health and substance use experts and adolescent SBIRT trainers) decided to replace, “I feel I do not have much to be proud of when working with drug users” with “I feel comfortable working with adolescents who use alcohol/drugs”. The original item raised several concerns, and the new item was intended to 1) reduce the possibility of socially-desirable responding and 2) fit better with the construct of self-efficacy (i.e., comfort/confidence with a population and/or specific practice). Provider comfort/confidence with a population or condition is significantly related to their practices (Pepper et al., 2014; Petroll et al., 2017), and comfort is particularly salient for providers with respect to discussing adolescent risk behavior (Rogers, 2003) including substance use (Shaw et al., 1978). Consistent with the DDPPQ, Likert-type responses range from 1 “Strongly Disagree” to 7 “Strongly Agree.” All negatively worded items were reverse scored prior to analyses.

The Preventative Medicine Attitudes and Activities Questionnaire (PMAAQ) (Short et al., 2006; Sterling et al., 2012) is a 16-item self-report scale that assesses providers' self-reported frequency of screening for risk behaviors (e.g., alcohol, tobacco, and illicit drug use, diet, exercise, oral health care, contraception, and depressive symptoms) and perceived effectiveness facilitating patient behavior change. Screening frequency items use a 7-point Likert scale ranging from “Never, 0%” to “Always, 100%”. Effectiveness items use 5-point Likert scale ranging from “Do Not Counsel” to “Very Effective”. This measure was selected to complement the ASUPPQ by asking about self-reported practices related to substance use screening in the context of screening for other presenting concerns among adolescents. Given the centrality of alcohol and drug use to the ASUPPQ, only frequency and effectiveness scores for the alcohol and drug use scales of the PMAAQ were used. Screening frequency and effectiveness items also offer the opportunity for construct validation of the ASUPPQ.

2.4. Analyses

A series of exploratory factor analyses (EFA) were used to test the factor structure of the ASUPPQ for providers who work with adolescents. Principal axis factoring was used, as it is superior to other extraction methods for solutions with few indicators per factor (Substance Abuse and Mental Health Services Administration (US) and Office of the Surgeon General (US), 2016). We used the Kaiser-Meyer-Olkin measure of sampling accuracy to determine inter-correlations between test items to assess appropriateness for factor analysis. The result was $KMO = 0.88$, which is considered acceptable (Tabachnick and Fidell, 2001). Bartlett's Test of Sphericity was significant ($\chi^2 = 3039.84$, $df = 231$, $p < .05$), suggesting the observed correlation matrix was appropriate for factor analysis.

To examine the convergent validity of the ASUPPQ, we examined

² There were originally 22 items in the adapted measure but after results of the current factor analysis, the measure was reduced to 18 items due to poor factor loadings for the 4 items that were dropped.

the association between ASUPPQ subscales and the PMAAQ. Because PMAAQ data were non-monotonic, correlation could not be used to assess the relation between PMAAQ and ASUPPQ scores. Instead, we examined group differences between low and high levels of screening and perceived effectiveness (PMAAQ) on ASUPPQ subscales using an independent-sample *t*-test and Analysis of Variance. For PMAAQ screening items, a median split was used to determine low (scores of 1–5) and high (scores of 6–7) scores. For the PMAAQ perceived effectiveness items, responses were collapsed into three groups: Individuals who endorsed “Do Not Counsel”, low perceived effectiveness (scores of 1–2) and high perceived effectiveness (scores of 3–4). The “Do Not Counsel” option was isolated as providers may use this item to indicate they choose not counsel or the item does not apply to their practice.

3. Results

3.1. ASUPPQ factor analysis

An initial exploratory factor analysis (EFA) including all 22 items using principal axis factoring and varimax rotation revealed a five-factor solution that explained 69.97% of the total variance. Items 15, 16, and 18 demonstrated high loadings on the fifth factor and were dropped because the content of the items are unrelated so their loadings were believed to be an artifact of item wording that resulted in a skewed distribution of responses (i.e., consistent disagreement with these negatively-worded statements). Also, the scree test indicated that the eigenvalue curve flattened starting at the fifth factor (Terhorst et al., 2013). A follow-up EFA with the remaining 19 items produced a four-factor solution explaining 71.63% of total variance. Item 19 (“On the whole, I am satisfied with the way I work with adolescents who use alcohol and/or drugs”) crossloaded onto two factors (0.35–0.47) and thus was also dropped (Vendetti et al., 2017). A final EFA with the resulting 18 items produced the best model fit, which was a four-factor solution explaining 73.42% of the variance (see Table 1). The items loading on to the Role Adequacy, Role Support, and Role Legitimacy subscales were the same as the items that loaded onto those scales in the DDPPQ (Osborne et al., 2008). The remaining items composed a new, fourth factor of the ASUPPQ, which originally loaded on to the DDPPQ Job Satisfaction and Task-Specific Self-Esteem subscales. We named this factor “Role Motivation and Self-Efficacy.” Cronbach's alphas were calculated using items within each factor to examine internal reliability; each factor demonstrated excellent reliability ($\alpha_{\text{factor 1}} = 0.96$, $\alpha_{\text{factor 2}} = 0.89$, $\alpha_{\text{factor 3}} = 0.93$, $\alpha_{\text{factor 4}} = 0.87$).

3.2. Association between ASUPPQ and PMAAQ

Each of the ASUPPQ subscales are presented below with respect to self-reported screening practices and effectiveness in treatment (for adolescent alcohol and illicit drug risk) per the PMAAQ. Tables 2, 3, 4, and 5 display the results for each self-reported practice per the PMAAQ. However, results are discussed in text below for each subscale of the ASUPPQ to inform interpretations about the convergent validity of each subscale with the PMAAQ.

3.2.1. Role Adequacy

Significant group differences were observed between participants who reported low versus high alcohol assessment practices on the Role Adequacy subscale ($t(142) = 4.42$, $p < .001$). Specifically, high frequency screeners of alcohol ($M = 36.86$, $SD = 7.56$) reported significantly more Role Adequacy than low frequency screeners ($M = 30.29$, $SD = 10.16$). Similarly, high frequency screeners of illicit drugs ($M = 37.23$, $SD = 7.37$) endorsed significantly more Role Adequacy than low frequency screeners ($M = 29.56$, $SD = 10.00$, $t(142) = 5.28$, $p < .001$).

Significant differences on Role Adequacy were also observed between self-reported effectiveness in treating alcohol ($F(2, 141) = 17.54$, $p < .001$) and illicit drug use ($F(2, 141) = 19.36$, $p < .001$). Tukey

Table 1
Factor structure of the ASUPPQ using principal axis factoring and varimax rotation ($n = 276$).

Item	Factor loadings				
	Role adequacy	Role support	Role legitimacy	Role motivation/self-efficacy	
1. I feel I have a working knowledge of alcohol and drug problems.	0.73	0.22	0.18	0.21	
2. I feel I know enough about the causes of alcohol and drug problems to carry out my role when working with adolescents who drink alcohol/use drugs.	0.87	0.20	0.19	0.24	
3. I feel I know enough about alcohol and drug use effects on family/social relationships to carry out my role when working with adolescents who drink alcohol/use drugs.	0.80	0.23	0.22	0.23	
4. I feel I know enough about the physical/health effects of drugs and alcohol to carry out my role when working with adolescents who drink alcohol/use drugs.	0.82	0.28	0.23	0.09	
5. I feel I know enough about the factors which put adolescents at risk of developing substance use problems to carry out my role when working with adolescents who drink alcohol/use drugs.	0.75	0.18	0.32	0.28	
6. I feel I know how to counsel adolescents who drink alcohol or use drugs over the long term.	0.71	0.17	0.26	0.28	
7. I feel I can appropriately advise my adolescent patients about drug/alcohol use and their effects.	0.74	0.17	0.36	0.21	
8. I feel I have the right to ask adolescent patients questions about their drinking/drug use when necessary.	0.34	0.22	0.79	0.14	
9. I feel that my adolescent patients believe I have the right to ask them questions about drinking and drug use when necessary.	0.39	0.09	0.60	0.23	
10. I feel I have the right to ask an adolescent patient for any information that is relevant to their drug/drinking problem.	0.35	0.19	0.80	0.09	
11. If I felt the need when working with adolescents who drink alcohol/use drugs, I could easily find someone with whom I could discuss any personal difficulties I might encounter.	0.24	0.82	0.21	0.11	
12. If I felt the need when working with adolescents who drink alcohol/use drugs, I could easily find someone who would help me clarify my professional responsibilities.	0.23	0.85	0.16	0.12	
13. If I felt the need, I could easily find someone who would be able to help me formulate the best approach to an adolescent who drinks alcohol/uses drugs.	0.28	0.81	0.09	0.24	
14. I want to work with adolescents who drink alcohol/use drugs.	0.09	0.02	0.01	0.74	
15. I feel comfortable working with adolescents who drink alcohol/use drugs. (previously item #17 in DDPQQ)	0.23	0.13	0.12	0.73	
16. In general, one can get satisfaction from working with adolescents who drink alcohol/use drugs. (previously item #20 in DDPQQ)	0.17	0.15	0.14	0.72	
17. In general, it is rewarding to work with adolescents who drink alcohol/use drugs. (previously item #21 in DDPQQ)	0.16	0.10	0.11	0.80	
18. In general, I feel I can understand adolescents who drink alcohol/use drugs. (previously item #22 in DDPQQ)	0.35	0.16	0.14	0.69	

Table 2
ASUPPQ subscale score comparisons for low vs. high frequency screeners of adolescent alcohol Risk.

ASUPPQ subscale (outcome)	Low frequency screeners M (SD)	High frequency screeners M (SD)	t	df	p
Role adequacy	30.29 (10.16)	36.86 (7.56)	4.42	142	< 0.001
Role support	14.39 (4.80)	15.57 (4.39)	1.49	134	0.14
Role legitimacy	14.87 (4.33)	17.92 (3.39)	4.68	139	< 0.001
Role motivation and self-efficacy	22.69 (6.54)	26.51 (5.62)	3.69	136	< 0.001

Table 3
ASUPPQ subscale score comparisons for low vs. high frequency screeners of adolescent illicit drug risk.

ASUPPQ subscale (outcome)	Low frequency screeners M (SD)	High frequency screeners M (SD)	t	df	p
Role adequacy	29.56 (10.00)	37.23 (7.37)	5.28	142	< 0.001
Role support	14.35 (4.82)	15.56 (4.38)	1.53	134	0.13
Role legitimacy	14.72 (4.20)	17.92 (3.51)	4.93	139	< 0.001
Role motivation and self-efficacy	22.69 (6.55)	26.40 (5.67)	3.56	136	< 0.001

Table 4
Group differences on ASUPPQ subscale scores based on self-reported effectiveness in treatment of alcohol use.

Outcome	Do not counsel (0) M (SD)	Low perceived effectiveness (Harris et al., 2012a) M (SD)	High perceived effectiveness (Ozer et al., 2005) M (SD)	Test statistic	p	Significant group differences
Role adequacy	20.50 (5.80)	33.87 (8.62)	39.67 (9.37)	F(2, 141) = 17.54	< 0.001	2 > 1*; 2 > 0*; 1 > 0**
Role support	13.67 (5.00)	14.90 (4.40)	16.09 (4.81)	F(2, 134) = 1.07	0.35	ns
Role legitimacy	13.60 (3.63)	16.93 (3.95)	16.43 (4.48)	F(2, 138) = 3.16	< 0.05	2 > 0**; 1 > 0**;
Role motivation and self-efficacy	21.20 (4.34)	24.46 (6.33)	27.26 (6.31)	F(2, 136) = 3.53	< 0.05	2 > 0*

* p < .05, ** p < .01.

Table 5
Group differences on ASUPPQ subscale scores based on self-reported effectiveness in treatment of illicit drug use.

Outcome	Do Not counsel (0) M (SD)	Low perceived effectiveness (Harris et al., 2012a) M (SD)	High perceived effectiveness (Ozer et al., 2005) M (SD)	Test statistic	p	Significant group differences
Role adequacy	21.30 (7.04)	33.52 (8.62)	41.27 (8.46)	F(2, 141) = 19.36	< 0.001	2 > 1**; 2 > 0**;
Role support	15.33 (4.09)	14.65 (4.51)	16.95 (4.31)	F(2, 135) = 2.27	0.11	1 > 0**
Role legitimacy	13.60 (3.63)	16.65 (4.02)	17.67 (4.31)	F(2, 138) = 3.50	< 0.05	2 > 0*; 1 > 0**
Role motivation and self-efficacy	21.90 (5.28)	24.40 (6.31)	27.94 (6.04)	F(2, 137) = 3.86	< 0.05	2 > 1*; 2 > 0*

* p < .05, ** p < .01.

post-hoc tests revealed that participants who identified themselves as more effective endorsed more Role Adequacy than participants who self-reported as less effective ($p < .01, p < .001$) or indicated they did not counsel ($p < .001, p < .001$) on both alcohol and illicit drug use, respectively. Furthermore, participants self-identified as not effective reported more Role Adequacy than participants endorsing “do not counsel” for alcohol and illicit drug use ($p < .001, p < .001$).

3.2.2. Role Support

No differences were observed between participants who reported low versus high frequencies of alcohol assessment on Role Support ($t(134) = 1.49, p > .05$). Similarly, no differences were observed between high and low frequencies of illicit drug assessment ($t(134) = 1.53, p > .05$). Role Support did not differ across different

levels of self-reported effectiveness for changing alcohol risk ($F(2, 134) = 1.07, p > .05$) or illicit drug risk behaviors ($F(2, 135) = 2.27, p > .05$).

3.2.3. Role Legitimacy

Significant group differences were observed between participants who reported low versus high frequencies of alcohol assessment on the Role Legitimacy subscale ($t(139) = 4.68, p < .001$) such that high frequency screeners of alcohol ($M = 17.92, SD = 3.39$) reported significantly more Role Legitimacy than low frequency screeners ($M = 14.87, SD = 4.33$). Similarly, high frequency screeners of illicit drugs ($M = 17.92, SD = 3.51$) endorsed significantly more Role Legitimacy than low frequency screeners ($M = 14.72, SD = 4.20, t(139) = 4.93, p < .001$).

Significant differences on Role Legitimacy were also observed between self-reported effectiveness in treating alcohol ($F(2, 138) = 3.16, p < .05$) and illicit drug use ($F(2, 138) = 3.50, p < .05$). Tukey post-hoc tests revealed that participants who identified themselves as ineffective endorsed more Role Legitimacy than participants who indicated they did not counsel ($p < .001, p < .001$) on alcohol risk behaviors. Furthermore, participants endorsing effective change behaviors reported more Role Legitimacy than participants endorsing “do not counsel” for illicit drug risk ($p < .05$).

3.2.4. Role motivation and self-efficacy

Participants who reported assessing alcohol risk with high frequency ($M = 26.51, SD = 5.62$) endorsed more Job Satisfaction/Task-Specific Self-Esteem than low frequency participants ($M = 22.69, SD = 6.54, t(136) = 3.69, p < .001$). A similar pattern emerged with assessment of illicit drug risk: High frequency screeners ($M = 26.40, SD = 5.67$) reported more Job Satisfaction/Task-Specific Self-Esteem than low frequency screeners ($M = 22.69, SD = 6.55, t(136) = 3.56, p < .001$).

Role Motivation and Self-Efficacy differed significantly across different levels of self-reported effectiveness for changing alcohol risk behaviors ($F(2, 136) = 3.53, p < .05$) and illicit drug risk behaviors ($F(2, 137) = 3.86, p < .05$). Tukey post-hoc tests indicated that participants reporting effective alcohol risk change behaviors reported more

Job Satisfaction/Task-Specific Self-Esteem than participants endorsing “do not counsel” ($p < .05$) For illicit drug risk, participants endorsing effective change behaviors reported greater Job Satisfaction/Task-Specific Self-Esteem than participants endorsing ineffective change behaviors ($p < .05$) and “do not counsel” ($p < .05$).

4. Discussion

This study used an exploratory factor analysis (EFA) to 1) examine the structure of the ASUPPQ, a measure assessing health care providers' attitudes toward and self-efficacy working with adolescent substance use and 2) explore the relation between perceptions and screening practices. The EFA returned a four-factor solution representing Role Adequacy, Role Support, Role Legitimacy, and Role Motivation/Self-Efficacy as it relates to adolescent substance use problems. Based on the factor loadings, total variance explained (73%) and adequate internal consistency for the four factors, the ASUPPQ holds promise for assessing health care providers' attitudes toward and self-efficacy working with adolescents who use substances.

Significant differences in provider attitudes on the ASUPPQ based on providers' different levels of screening practices indicate adequate convergent validity with provider-reported effectiveness and screening practices. Within this sample, health care providers who reported being high frequency screeners of drug and alcohol also reported significantly greater Role Adequacy, Legitimacy, and Motivation/Self-Efficacy on the ASUPPQ. However, this trend was not found for the Role Support subscale. The three items that load on the Role Support domain all center around having professional mentorship. This finding was surprising given the special considerations associated with screening for substance use among adolescents which we would hypothesize drives more consultation among providers who screen. It is possible that the validity of this subscale is low for providers working with adolescents because consultation or mentorship is less readily available to them and/or does not impact practices. It is also plausible that the item wording does not accurately capture this construct as it pertains to adolescent patients.

Significant differences in self-reported attitudes (on three of the four ASUPPQ scales) among providers with high versus low screening practices are consistent with extant empirical literature and implementation theories that underscore the link between provider attitudes/beliefs and actual practices. Therefore, one use of the ASUPPQ may be to assess provider attitudes prior to training to determine provider readiness for learning about screening tools and practices and/or if a differentiated training curriculum is needed to target attitudes and self-efficacy first for some providers. Indeed, measures used before training initiatives to assess needs and baseline readiness to implement an innovation often include provider beliefs or attitudes about the topic or innovation among other indicators such as provider knowledge, practices, technical capability and organizational factors (Watson et al., 2003; Wilson et al., 2004; Yeazel et al., 2006). The ASUPPQ could also be used to identify opportunities to pair practitioners based on their perspectives about adolescent substance use to optimize peer learning and support throughout the training and implementation process.

Ultimately, these findings suggest that the ASUPPQ is a promising measure of provider perspectives toward adolescent substance use and is at least correlated with actual screening practices before training is provided. We recommend this measure to evaluate provider readiness for screening and brief intervention training. Additional research on provider attitudes and perceptions about adolescent substance use is needed to inform strategies to increase adolescent substance use screening.

5. Limitations and future directions

Our study utilized a convenience sample of providers in one state who were required by their site to attend an adolescent SBIRT training.

Thus, our sample might reflect a sampling bias of providers who are most compliant with their practice requirements and/or providers who work at sites where administrators value adolescent substance use screening. Future research is needed to replicate our findings with other samples for external validity.

Also, the health care providers in our study work at many different health care sites across the state, meaning our data are nested with at least two levels. As all large samples conducting similar research will likely be multi-level, mixed modeling would be more robust to account for nested data and to more specifically examine the effect of potentially nested data on these results. Additional samples with which to validate the psychometrics of this measure is advised to validate the current set of 18 items in other samples and examine whether items and/or the addition of items that tap adolescent-specific considerations (e.g., confidentiality with caregiver) are beneficial. Also, a larger sample size would allow splitting of the data to use half of the sample for an exploratory factor analysis and the other half for a confirmatory factor analysis. Due to our current sample size, this method was not available to us.

The ASUPPQ was adapted from a measure designed for assessing attitudes toward adult patients. Future research should focus on identifying the unique constructs related to treatment of adolescents that should be included when assessing provider attitudes. For example, additional items specific to working with adolescents (e.g., interacting with parents, determining the bounds of confidentiality between adolescent and parent as it pertains to adolescents reporting substance use risk or behaviors) may be useful to develop, incorporate and test in future uses of this measure.

Conflict of interest

The authors declare there is no conflict of interest.

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