The validation of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) amongst Pacific people in New Zealand

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The aim of this study was to examine the validity of the WHO Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) in Pacific People in New Zealand (NZ). Face validity was initially examined via focus groups. Feedback was largely positive with suggestions for modifications (simplifying questions, incorporating local slang), adopted and incorporated. The concurrent, construct and discriminative validity of the modified ASSIST was then examined in 150 Pacific people (100 from primary care, 50 from addiction treatment). Participants were administered the modified ASSIST and a battery of tests that offered alternative measures of the phenomena of interest. Results demonstrated that the ASSIST had satisfactory concurrent and construct validity. Results for discriminative validity were limited, in that participant numbers in drug categories, other than alcohol, were too small to permit analyses. The modified ASSIST could be used as a culturally acceptable screening tool for problematic substance use for Pacific people in NZ, but further research is required to examine discriminative validity.

Keywords: ASSIST, validation, problematic substance-use, Pacific, New Zealand

Pacific people in New Zealand (NZ) have higher rates of substance use disorder than that of the general New Zealand population. The NZ Mental Health Survey showed that the lifetime prevalence of any substance use disorder for Pacific People in general was 17.7% compared to 12.3% in the general population, and the 12 month prevalence was 4.9 % compared to 2.7 % in the general population (Oakley, Wells, & Scott, 2006). The most prevalent specific substance use disorders were related to alcohol use and marijuana use (Ministry of Health, 2008, 2010). Furthermore, Pacific people are reportedly less likely to use alcohol and other drug services than other groups that would have the potential to reduce current and potential drug-related harms (Ministry of Health, 2008).

The link between screening for substance use and effective interventions for problematic drug use in primary health care settings (i.e., general practice, community health centers) is well established and is recognized as a cost effective method of reducing disease burden (WHO Assist Working Group, 2002). The Alcohol Smoking and Substance Involvement Screening Test (ASSIST) was developed for the World Health Organization (WHO) to screen for problem or risky use of tobacco, alcohol, cannabis, cocaine, amphetamine type stimulants, sedatives, hallucinogens, inhalants, opiates and other drugs in primary care settings (WHO Assist Working Group, 2002). The ASSIST (Version 3.0) is a pencil and paper questionnaire consisting of 8 items. The interview commences with a general screening question that asks about lifetime drug use. If the respondent admits to recent drug use the interview continues, but if there has been no drug use then the interview can be terminated. Question 2 asks about recent drug use (last 3 months). If none of the substances have been used in the last three months then the interviewer skips to the final three questions that explore problems and patterns of use in their lifetime. Question 3 measures psychological dependence; Question 4 harmful substance use; Question 5 asks about whether the respondents have failed to meet role obligation; Question 6-8 asks about lifetime and recent problems including whether friends or relatives have expressed concern, prior attempts at controlling their drug use, and whether they inject. The interview can be completed in about 10 minutes (Humeniuk et al., 2008). According to the score obtained on the questionnaire respondents can be classified according to their level of risk (low or non-problematic substance use, moderate or risky use, high or problematic/dependent use) (Humeniuk et al., 2008). For those individuals whose substance use may be classified as 'moderate risk' (that is, harmful but non-dependent), and whose substance use may otherwise have gone undetected, an appropriate brief intervention can be delivered (Humeniuk et al., 2008).

The ASSIST has undergone initial psychometric evaluation through a multisite international study to ensure that it is feasible, reliable, culturally acceptable and valid in the populations in which it was tested (Australia, Brazil, India, Thailand, United Kingdom, USA, Zimbabwe) (Humeniuk et al., 2008; Newcombe, Humeniuk, & Ali, 2005). Studies have explored its validity within different population groups; older adults (Khan et al., 2012), adolescent primary care patients (Gryczynski et al., 2015), prison inmates (Holmwood, Marriott, & Humeniuk, 2008) and psychiatric patients (Hides et al., 2009; Khan et al., 2011) In all cases the ASSIST was found to be acceptable and valid as a screen for poly drug use. Furthermore, it has been translated into a number of languages according to the WHO guidelines for translation and adaptation

of instruments (http://www.who.int/substance_abuse/activities/assist/en/index.html), and a number of these have undergone psychometric evaluation, including the French (Khan et al., 2011) and Portuguese versions (Henrique, De Micheli, Lacerda, Lacerda, & Formigoni, 2004). However, the ASSIST has not been validated for use within Pacific people in New Zealand. Indeed, as far as the authors are aware no screening tests have been created specifically for Pacific people in primary care settings (Matua Raki, 2011). Therefore, demonstrating the validity of the ASSIST in Pacific people should encourage its use by health professionals, and will facilitate early detection of problematic substance use and permit the delivery of an appropriate intervention that is likely to reduce harms from substance misuse.

The aim of this project was to determine the validity of the ASSIST (Version 3.0) in Pacific People in New Zealand. In order to do this we conducted two studies; the first examined the face validity of the ASSIST in a sample of Pacific People resident in New Zealand in order to determine if any modifications to the existing ASSIST questionnaire (Version 3.0) were required to enhance its appropriateness for this population; the second study was a formal examination of the concurrent, construct and discriminative validity of the ASSIST questionnaire that had been modified to reflect the results obtained from the first study.

Study 1 – Examination of the face validity of the ASSIST with Pacific people

Method

Participants and Study Design

Ethical approval was obtained from the University of Auckland Human Participants Ethics Committee. Face validity is described as the applicability or the relevance of the test to the population. It is not usually a parameter that can be described using statistical methods but rather is a qualitative assessment of whether or not an instrument is reasonable and applicable and "makes sense" to the people it is administered (Davidshofer & Murphy, 2005; Nevo, 1985). Therefore a series of structured focus groups were used to examine the face validity of the ASSIST (version 3.0) questionnaire.

Three focus groups were conducted with Pacific community members. These were stratified into three age groups: Focus Group (FG) 1 (18-29 years), FG 2 (30-44 years), and FG 3 (45+ years). All groups comprised mixed gender and mixed Pacific ethnicity. A fourth FG was conducted with an expert group of Pacific alcohol and drug health practitioners. Participants were recruited using the personal contacts of the researchers. The non-expert groups were recruited by one of the authors (JS) who is of Samoan ethnicity, and members of the expert panel where recruited by other authors (DN and VN) who have contacts with local Pacific Alcohol and Drug services. Participants were excluded if they were not 18 years of age or over, did not identify with a Pacific identity or were currently being treated or had been treated for alcohol or drug problems (excluding nicotine dependence) in the past. The latter criterion was included to ensure that participants were likely to be representative of those who would access primary health care (and hence who are the target of screening) rather than people with experience of problematic substance use and/or who had engaged specialist alcohol and drug services. Twenty participants were recruited, Ten Samoan, 4 Fijian, 3 Niuean, and 3 Tongan; Ten were male and ten were female.

Procedure

All focus groups were facilitated by one of the authors (JS) who is an experienced Pacific researcher. Cultural protocols determined which practices regarding opening, conduct and closing of the groups were observed. Accordingly in some cases, groups were opened with a prayer or on one occasion a kava ceremony. In brief, participants were asked to undertake three tasks during the focus groups: 1) To consider the instructions on the front page of the questionnaire, and whether changes were required to increase understanding of them; 2) To consider the list of drug names provided in Question 1 of the questionnaire (lifetime use), and whether they reflected the local colloquialisms for each drug; 3) To consider each question that comprised the ASSIST (version 3.0) questionnaire and to report any difficulty in their understanding of each question. Discussion during the focus groups were recorded using a digital audio recorder and transcribed by the researcher shortly after the interview took place. The transcripts were reviewed for emergent themes using a general inductive approach (Thomas, 2006). Key themes across transcripts were grouped and summarized.

Results and Discussion

In the interest of brevity only the key themes will be presented. In general, participants across all four focus groups reported few issues with the introduction. Participants in the key expert group suggested that that the length of the introduction should be shortened as much as possible, particularly when interviewing young adults. In addition, there was consensus around the need to simplify the language used, or to be prepared to explain to the interviewee terms such as 'illicit".

Participants in all four focus groups were able to provide local colloquialisms for tobacco products (for example, ciggies, rollies, smokes, chewing tobacco, cigars), alcoholic beverages (beer, wine, spirits, home brew, RTD's) and cannabis (weed, ganja, mary jay, hash, dack). However, only alcohol and drug clinicians were able to supply alternative names for the remainder of the drug categories; for example for amphetamine-type stimulants the common names supplied included P, ice, crystal meth, ecstasy, and for opioids they included done/methadone, neurofin, homebake. They also suggested that the colloquialisms for all drug categories produced during the focus groups be stated alongside the supplied common name for each drug. Furthermore, they suggested kava be included as a separate category. Even though it could be included in the "other" drug category, some participants felt that given the importance of kava drinking among some Pacific people it would be worthwhile to also specifically include it in the ASSIST (Nosa & Ofanoa, 2009; Pacific Research and Development Services, 2004).

Participants did not report any issue with understanding questions 1 (Which of the following substances have you

ever used?) and question 2 (In the past three months, how often have you used the substances you mentioned?). Question 3 asks "during the past three months, how often have you had a strong desire or urge to use [insert drug name]?" Participants had a good grasp of the terms "strong desire" and "urge" describing it as:

'How often do you really really want to take that substance; do you really really need it? ' [Female, FG 3]

Question 4 reads "during the past three months, how often has your use of [insert drug] led to health, social, legal or financial problems?" Participants across all focus groups indicated that they or their peers might have difficulty understanding this question for a number of reasons. Firstly there may be a language barrier:

"I think probably only a New Zealand born would understand ... but for everyone else you'd really have to break it down "… [Male, FG 4]

To overcome this, participants suggested giving examples:

You say "health" and just explain. Are you tired, lazy, don't want to do any stuff during the day, sleepiness…Rather than use the word "financial" use the word "money". [Female, FG 2]

Secondly, some participants felt that this question could be broken down into separate questions for easier understanding.

"So do you have any health issues because of the way you've been drinking or how much you've been drinking?" "Have you ever gotten in trouble with the law over the past 3 months because you've been drinking or you've been drunk?" and then you'd explore that further and then move on. [Female, FG 4].

Participants did not report any issues with understanding question 5 "During the past 3 months, how often have you failed to do what is normally expected of you because of your use of [insert drug]?'. However participants were concerned with aspects of Question 6 "Has a friend or relative or anyone else ever expressed concern about your use of [insert drug]" Participants were uncomfortable with the term "expressed concern" and participants in all four focus groups instead preferred the word "worry". For example;

"Has anyone ever worried about your use of alcohol" [Female, FG 1]

"Worry, worried, just say worried "[Female, FG 2]

Many participants foresaw difficulties in understanding question 7 which reads "Have you ever tried and failed to control, cut down or stop using [insert drug]?" The major issue identified concerned the length of the question. This could be overcome by breaking the question into parts for easier understanding, as is recommended in the questionnaire manual (Humeniuk, Henry-Edwards, Ali, Poznyak, & Monteiro, 2010). Participants also mentioned that wherever possible it is important to have a Pacific person administer the ASSIST questionnaire, and to have available Pacific language translations of the questionnaire.

In summary, the aim of this study was to examine the face validity of the ASSIST (V3.0) in People of Pacific ethnicity in New Zealand as the first step in its formal validation for use with this population group. For the ASSIST to be more acceptable to the Pacific community in New Zealand a number of recommendations were proposed and which were incorporated into a modified version of the questionnaire (ASSIST V3.0r). These were: 1) Shorten the length of the introduction as much as practicable; 2) Incorporate common/ slang names into the questionnaire so drug categories are more easily identifiable; 3) Expand the ASSIST drug categories to include kava use; 4) Use simpler words (where possible) and replace terms such as "expressed concern" with everyday words such as "worry". The ASSIST (Version 3.0r) is attached (Appendix 1.)

Study 2 - Validation of the modified ASSIST (ASSIST Version 3.0r)

Method

Participants and study design

Ethical approval for this study was obtained from the New Zealand Health and Disability Ethics Committee (Ref. CEN/11/03/011). One hundred and fifty people who self-identified as being of Pacific ethnicity were recruited for this study between July 2011 and February 2013. The sampling procedure utilised was based on that previously described (Newcombe et al, 2005). In brief, to ensure that the sample comprised of participants who exhibited a range of substance use, from occasional or non-problematic substance use through to dependent use, 100 hundred participants were recruited from primary care settings, such as Pacific Primary Health Organisations (GP surgeries), and 50 from specialist addiction treatment settings. The aim was to establish three reference groups; 1) abstinence or non-problematic users, 2) current substance users (abuse), and 3) dependent users. In addition, a stratified sampling procedure was used to ensure that recruitment was balanced with regard to gender and the following age groups: 18-25, 26-35, and 36-45 years. Every attempt was made to ensure adequate representation of each of the major Pacific Island groups present in New Zealand (i.e., Samoan, Tongan, Cook Island Māori, Niuean, and others). The following exclusion criteria were used to screen out ineligible participants; 1) inability to speak or understand English, 2) aged under 18 or over 45 years, 3) communication difficulties, 4) severe behavioural disturbances, and 5) current drug and alcohol intoxication and/or withdrawal.

Procedures

Participants from community settings were recruited by way of flyers placed in the waiting rooms of agencies. Interested individuals were asked to phone a Pacific researcher for a preliminary screen to determine if they were suitable for the study. Recruitment of participants from treatment settings was by means of flyers placed in outpatient clinic areas or through direct approaches from a Pacific researcher or the treating clinician. In both cases the individuals were provided with a participant information sheet and permitted time to consider their involvement in the study, with instructions to contact the researcher if they were interested in volunteering.

A comprehensive test battery was administered, either in the private of the participant's home, or at the research office in the University grounds or treatment setting. Participants were

assured that all information provided was strictly confidential and provided informed written consent. All interviews were undertaken by trained Pacific researchers and took between 60-90 minutes to complete. Participants were compensated NZ $50 upon completion of the testing.

Measures

The comprehensive test battery consisted of a demographic questionnaire that collected information on sociodemographic variables, educational and occupations status, and past treatment for alcohol and drug use, the modified ASSIST questionnaire (ASSIST V3.0r), and the following standardised questionnaires:

- The Addiction Severity Index-lite version (ASI-Lite) which assesses lifetime and recent (last three months) alcohol and drug use (but not tobacco use), and family history of related problems (McLellan et al., 1985b);
- The Severity of Substance of Dependence Scale (SDS) that assesses aspects of psychological dependence (Gossop, Best, Marsden, & Strang, 1997);
- The MINI international Neuropsychiatric Interview (MINI-Plus), a structured diagnostic interview that assesses DSM IV major axis 1 disorders. In this study sections related to drug and alcohol use (lifetime and last 12 months), attention deficit/hyperactivity (ADHD) and, to antisocial personality disorder (ASPD) were administered to determine the presence/absence of diagnosis of substance abuse/dependence and ADHD/ASPD disorder (ADHD) (Sheehan et al., 1998);
- The Drug Abuse Screening Test (DAST) designed to assess the medical, social and behavioural events common to drug users (Skinner, 1982);
- The Alcohol Use Disorders Identification Test (AUDIT) to permit comparison with ASSIST alcohol scores (Saunders, Aasland, Babor, De la Fuente, & Grant, 1993);
- The Revised Fagerstorm Tolerance Questionnaire (RTQ) which measures nicotine dependence and supplements information provided by the ASI-lite which does not collect information about tobacco use (Tate & Schmitz, 1993);
- The Maudsely Addiction Profile (MAP) which provides a functional assessment of an individual's physical health, anxiety and depression (Marsden et al., 1998).

The following domains derived from the ASSIST were utilised in this study (Newcombe et al., 2005). The Specific Substance Involvement Score (SSI) for each substance (calculated by summing the response weights to Q2-Q7 within each substance class), the Current Frequency of Substance Use (item score for Q2 for each substance), the Total Current Frequency of Use (the sum of response weights for Q2 across all substances, excluding tobacco and other drugs) and, the Global Continuum of Risk Score (including alcohol and tobacco) (calculated by summing the response weights to Q2-Q8 across all substances plus Q8).

Data analysis

Data were analysed using IBM SPSS 21. Proportions, mean±standard deviation (SD) were used to summarise the baseline characteristics. Independent samples t-test and chi square were used to investigate differences between the primary health group and treatment groups at baseline. SPSS undertakes Levene's test of homogeneity of variance when undertaking t-tests and adjusts the probability accordingly. Statistical tests were two tailed. In view of the increased likelihood for type 1 error caused by multiple comparisons, the alpha level was adjusted so that $P<0.01$ was required for significance.

The examination of the psychometric properties of the modified ASSIST (V3.0r) utilised the protocol previously described (Newcombe et al., 2005). In brief, concurrent validity was assessed by comparing ASSIST scores with relevant scores from other instruments which measure the same or similar phenomena. Pearson's correlation coefficients were calculated between ASSIST scores and scores from the ASI-lite, MINI-plus, SDS, RTQ, DAST, and AUDIT. In addition, independent t-tests were used to compare SSI scores for each substance divided according to the presence or absence of Mini Plus diagnoses of current or lifetime substance abuse or dependence.

Construct validity was examined by comparing ASSIST scores with scores obtained from instruments designed to measure phenomenon or constructs of interest. Pearson's Correlations were calculated between ASSIST scores and measures derived from the MAP and ASI that reflect physical, psychological or social problems associated with substance use. ASSIST scores divided according to MINI-plus diagnoses of ADHD and ASPD were also compared using independent t-tests. Individuals with either of these disorders are at a higher risk of developing substance related disorders and so would be expected to have higher ASSIST scores (Babor, Kranzler, & Lauerman, 1989).

In order to examine discriminative validity participants were grouped into three groups (dependence, abuse and non-problematic substance use). Those in the dependent group were participants who met MINI-plus diagnoses for current dependence on certain substances. Participants recruited from primary health care settings were classified as substance abusers or non-problematic users, according to presence/absence of MINI-Plus diagnoses. One-way analysis of variance (ANOVA), with post hoc Scheffe's tests, were used to compare ASSIST scores between the three groups with a significant difference in ASSIST scores between groups indicating good discriminative validity. Receiver operating characteristic (ROC) analysis was used to identify cut-off scores which would discriminate between non-problematic use and abuse, and abuse and dependence.

Results

Sample characteristics

Table 1. presents sociodemographic details for all one hundred and fifty participants interviewed for this study. The mean age of the sample was 30.6 years (SD=7.70) and there were equal numbers of male and female participants. Approximately an equal proportion of participants identified themselves as either Samoan (37%) or Tongan (36 %), with 19 % as Niuean and the remaining as Cook Island Maori (7%). Approximately half (n=73) of participants were unemployed; 42 % (n=63) were employed full time,

and nine percent (n=14) employed part-time, respectively. There were significant between group (Primary Health Care vs Addiction Treatment) differences in education level, marital status, employment status, and ASSIST score for tobacco, alcohol, cannabis and amphetamines.

Concurrent validity

Comparison with the Addiction Severity Index, SDS, RTQ and AUDIT. There were significant positive correlations (r = 0.45 – 0.86; P<0.001) between the ASSIST Current Frequency of Use Score (ASSIST Q2) for alcohol, cannabis, cocaine, amphetamine-type stimulants, inhalants, hallucinogens and opioids and the relevant questions from the ASI. As the ASI classifies substances differently than the ASSIST (i.e. it has two questions for sedatives and three for opiates) the substance used most frequently was used for the comparison with ASSIST scores. There

Table 1. Socio demographic and clinical details of participants

	Group			
	Total sample (n=150)	Primary Health Care (n=100)	Addiction Treatment (n=50)	Statistic (*P*-value)
Age, mean ±SD	30.6±7.7	30.45±7.41	30.56±78.0	*t*=-0.83, 0.934.^{NS}
Gender, n (%)				
Male	75 (50)			
Female	75 (50)			
Ethnicity n (%)				χ2=11.72, 0.02^{NS}
Samoan	56 (37.3)	28 (28)	28 (56)	
Tongan	54 (36.0)	41 (41)	13 (26)	
Cook Is	10 (6.7)	23 (23)	6 (12)	
Niuean	29 (19.3)	7 (7)	3 (6)	
Tokelauan	1 (0.7)	1 (1)	0 (0)	
Education, yrs ±SD	13.06±3.68	14.35(3.25)	10.50±3.11	*t*=6.94, <0.0001
Professional Status. n (%)				χ2= 30.93, <0.0001
Working	77 (51.3)	65 (65.0)	9 (18)	
Not working	73 (48.7)	33 (33.0)	41 (82)	
Married Status, n (%)				χ2= 7.79, 0.004
Married/co-habiting	66 (44.0	52 (52.0)	14(28)	
Single/divorced/separated	84 (56.0)	48 (48.0)	35 (70)	
ASSIST SSI Score , mean ±SD				
Tobacco	11.8±11.5	8.46±10.3	18.56±10.9	*t*= -5.6. <0.001
Alcohol	13.4±11.2	10.35±9.4	19.38±12.0	*t*= -4.7, <0.001
Cannabis	4.8±8.8	2.80±6.1	8.70±11.7	*t*= -3.4, 0.001
Cocaine	0.7±3.0	0.18±1.1	1.58±4.7	*t*=-2.1, 0.046 ^{NS}
ATS	1.7±5.9	0.36±1.4	4.28±9.5	*t*=-2.9, 0.006
Inhalants	0.5±1.7	0.21±1.2	1.02±2.3	*t*=-2.3, 0.024 ^{NS}
Sedatives	0.6±2.6	0.19±1.3	1.28±4.1	*t*=-1.9, 0.069 ^{NS}
Hallucinogens	0.3±1.4	0.15±0.8	0.72±2.1	*t*=-1.9, 0.065 ^{NS}
Opioids	0.1±0.5	0.02±0.2	0.16±0.9	*t*=-1.5, 0.28 ^{NS}
Kava	0.4±1.6	0.27±1.4	0.52±2.0	*t*=-0.87, 0.32 ^{NS}

Notes: Ethnicity – self-described. ASSIST scores are Specific Substance Involvement Scores for each substance; ATS= Amphetamine-type stimulants. *P* value – significance for comparisons between Community and Addiction Treatment groups. NS=Not significant.

was also a significant positive correlation (r=0.82, P<0.001) between the ASSIST Total Current Frequency of Use Score and a derived ASI score (total number of days used in the last three months for all substances on the ASI). The ASSIST Global Continuum of Risk score was significantly correlated with the score obtained on the SDS (r=0.50, P<0.01), and the DAST (r=0.74, P<0.01). Furthermore, the ASSIST SSI scores for tobacco and alcohol were significantly correlated with the corresponding scores on the RTQ (r=0.73, P<0.01) and AUDIT (r=0.77, P<0.01), respectively.

ASSIST Scores according to Mini-Plus diagnoses. Participants who met criteria for MINI-Plus diagnoses of abuse or dependence for alcohol, cannabis and amphetamines had significantly higher ASSIST SSI scores than those who did not meet such criteria (see Table 2). No participants met diagnostic criteria for any of the remaining substances. The ASSIST Global continuum of risk score was significantly correlated with the total number of individual diagnoses recorded on the MINI-Plus (r=0.42, P<0.001).

was significantly correlated with the following ASI measures of phenomenon or constructs of interest: family history of addiction related and psychiatric problems (r=0.36, P<0.01); reported emotional burden of drug and alcohol use (r=0.65, P<0.01) and financial burden of drug and alcohol use (r=0.53, P<0.01). Furthermore, the ASSIST SSI alcohol score was significantly correlated with the following ASI measures: the financial burden of alcohol use (r=0.43, P<0.01), and the emotional burden of alcohol use (r=0. 44, P<0.01), but not with the number of times ever treated for alcohol abuse (P=0.05).

ASSIST Global Continuum of Risk and Total Current Frequency of Substance use (excluding tobacco and other drugs) were significantly correlated with the sum of physical and psychological health problems as measured by the MAP, r=0.57, P<0.01 and r=0.43, P<0.01).

Comparison with MINI-Plus diagnoses of ADHD and ASPD. The mean Global Continuum of Risk score did not differ between those diagnosed with ADHD (60.2±55.3 (n=5) and those who were not ((43.9±33.6 (n=145), P=0.29)). On the other hand, this score was significantly greater for those participants diagnosed with ASPD (80.8±45.5; n=20) than those not diagnosed with the disorder (38.8±28.7; n=130) (t=-5.57, P<0.01).

Discriminative Validity

Table 3. shows the results of ANOVA and post-hoc analyses used to determine if ASSIST scores from participants in this study were significantly different between the three known groups. There were significant differences between 'use' and 'abuse' for Global Continuum of Risk, and Substance Involvement scores for alcohol. Furthermore, there was a significant difference between 'abuse' and 'dependence' for Global Continuum of Risk, but not for Substance Involvement scores for alcohol. There were insufficient cases to conduct analyses for cannabis, cocaine, amphetamines, sedatives, hallucinogens, opioids, and kava.

ROC analyses identified cut-off scores that best separate the groups. Area under the ROC curve (AUC) is also presented. The closer AUC is to 1 the more disparate the groups.

Table 2. Comparison of mean (SD) ASSIST scores divided according to the presence or absence of MINI-Plus current or lifetime diagnoses of abuse or dependence for each substance.

MINI-Plus current or lifetime diagnosis of abuse or dependence	ASSIST Substance Involvement Score		
	Diagnosis present (n)	Diagnosis absent (n)	Statistic, *P* value
Alcohol	16.2 (11.4) (110)	5.7(5.8) (40)	*t*= -5.6, *P*<.001
Cannabis	19.5 (10.9) (12)	3.4 (7.2) (138)	*t*= -7.3, *P*<.001
Amphetamine-type stimulants	27.8(9.5) (5)	0.8 (3.0) (145)	*t*= -17.8, *P*<.001
Cocaine	na, 0	0.7 (3.0)	na
Inhalants	na. 0	0.5 (1.7)	na
Sedatives	na, 0	0.6 (2.6)	na
Hallucinogens	na, 0	0.3 (1.4)	na
Opioids	na, 0	0.1(0.5)	na

Note: na= not applicable; - no participants met MINI-Plus current or lifetime diagnoses for abuse or dependence on cocaine, inhalants, sedatives, hallucinogens, opioids.

Construct Validity

Comparison with the Addiction Severity Index and MAP. The ASSIST Global Continuum of Risk score

Table 3. Discrimination between use and abuse: abuse and dependence using ANOVA and Receiver Operating Characteristic (ROC) analysis

ASSIST Domain	ROC (AUC)	ROC Sensitivity (%)	ROC Specificity (%)	ASSIST Cut-off score	ANOVA Mean diff.
Global Continuum of Risk					
Use/abuse	0.82	92	66	29.5	26.67 ***
Abuse/depend[2]	0.70	81	60	45.5	25.35 ***
SSI[1] score for Alcohol					
Use/abuse	0.76	74	75	11.5	10.28 ***
Abuse/depend[2]	0.62	65	63	24.5	4.44 NS

Notes: [1]SSI=substance involvement score; [2]depend=dependence; *** $P<0.001$. NS=Not significant. Too few cases to undertake analyses for cannabis, cocaine, amphetamines, sedatives, hallucinogens, opioids, kava. Participants in dependence and abuse groups met MINI-Plus criteria for either diagnosis, respectively.

Discussion

The results of this study clearly indicate that the ASSIST (Version 3.0r) is an acceptable screening test for use with people of Pacific ethnicity residing in New Zealand. In addition the revised version of the ASSIST was found to have good concurrent and construct validity when used in Pacific people who were using a variety of psychoactive substances and who exhibited varying degrees of substance misuse. These findings are consistent with previous studies that have examined the validity of the ASSIST (Hides et al., 2009; Humeniuk et al., 2008; Khan et al., 2011; Newcombe et al., 2005).

In order to examine the validity of the ASSIST in Pacific people we utilised a somewhat unique approach. Initially, the face validity of the ASSIST was examined through a series of focus groups with Pacific community members and Pacific alcohol and drug practitioners. This was considered important to ensure that the test is understood and viewed as culturally appropriate to encourage its adoption by Pacific health professionals and to encourage engagement with Pacific people in the community. Feedback from participants was generally positive regarding their understanding of the questions that make up the test. Participants suggested few changes to the wording and the way some questions could be asked to help in their understanding. In addition they provided local 'slang' names for substances that are likely to be understood by local Pacific people. As a result a modified version of the ASSIST was produced that was utilised in the further validation of the test.

In order to examine the concurrent, construct and discriminative validity of the ASSIST (version 3.0r) we utilised a sampling frame that required the recruitment of participants who exhibited substance use along the continuum of non-problematic to dependent. This was achieved by recruiting participants from community agencies, such as Pacific Primary Health Organisations, and addiction treatment agencies. Recruitment from the latter proved difficult because of the relatively low numbers of Pacific clients who were attending these agencies at the time, which would be consistent with reports that Pacific peoples are less likely to use alcohol and drug treatment services than other groups (Ministry of Health, 2008). Nevertheless, we were successful in recruiting sufficient participants from either context and in establishing groups that could be differentiated on the basis of drug use and other related socio-economic variables. That is, participants recruited from community agencies exhibited lower drug use (ASSIST scores), but greater levels of educational attainment and employment participation, than those recruited from addiction treatment agencies.

The concurrent validity of the ASSIST was clearly evident in the significant positive correlations between ASSIST scores and scores derived from a number of existing gold standard instruments, such as the ASI, SDS, RTQ, and AUDIT, that provided collateral validation of substance use, abuse and dependence. ASSIST SSI scores were significantly greater in those participants who had received a diagnosis of substance abuse or dependence on the MINI-Plus, which indicates that the ASSIST SSI scores reflected problematic substance use. Moreover, there was also good evidence for the construct validity of the ASSIST in this study. Construct validity was demonstrated by significant correlations between ASSIST scores and measures derived from instruments that provide circumstantial evidence for substance abuse and dependence and its consequences, including physical, psychological and social problems (Babor et al., 1989). In addition, as expected participants diagnosed with ASPD, which is considered a risk factor for developing substance–related disorders (Babor et al., 1989), had significantly higher ASSIST scores than those that were not diagnosed with the disorder.

Results concerning the discriminant validity of the ASSIST were limited and it was only possible to explore alcohol with any reliability for ROC analyses. ASSIST Global Continuum of Risk scores could be used to discriminate between non-problematic use, abuse and dependence. ASSIST SSI scores for alcohol could be used to discriminate between non-problematic use and abuse, but not abuse/dependence. Indeed, the sensitivity and specificity values derived were not optimal in some cases. These results contrast with reports from previous studies demonstrating that ASSIST SSI scores can be used to discriminate between non-problematic substance use, abuse and dependence for most of the drugs of abuse listed by the ASSIST (Humeniuk et al., 2008; Newcombe et al., 2005). One plausible explanation for this discrepancy relates to the fact that the majority of participants recruited from specialised addiction services were enrolled in an abstinence oriented treatment programme. That is,

although they would have a diagnosis of substance dependence they would have likely scored less on the ASSIST, because of their recent abstinence, than if they were not in such a treatment programme. Furthermore, the aforementioned studies (Humeniuk et al., 2008; Newcombe et al., 2005) employed external validation of drug use via biological markers, and diagnosis of substance abuse and dependence via an independent clinical evaluation, rather than relying on participant self-report to verify participant's diagnosis of substance abuse or dependence. Unfortunately the latter measures were beyond the scope of this study.

Using a reliable and valid screening tool to detect risky psychoactive substance use is considered a key element to a public health approach to early intervention for drug-related problems (Babor & Kadden, 2005; Humeniuk et al., 2008; WHO Assist Working Group, 2002). As Pacific people in New Zealand are reportedly less likely to use alcohol and other drug services than other ethnic groups they are therefore less likely to access appropriate interventions for their drug misuse (Ministry of Health, 2008). Screening tools, such as the ASSIST, provide health professionals with an opportunity to detect and engage with clients who are in need of an intervention for their substance misuse (Humeniuk et al., 2012). The ASSIST has a number of advantages over other available screening instruments for substance use, including screening for a variety of psychoactive substances, rather than just one, such as the AUDIT (Saunders et al., 1993) and RTQ (Tate & Schmitz, 1993); it is relatively quick and easy to administer in comparison to other poly drug use screens (such as the ASI (McLellan et al., 1985a)); and it is freely available. In addition, linking a brief intervention (BI) to the scores on the ASSIST allows the health professional to intervene with individuals found to be at risk from using substances. There is good evidence for the effectiveness of BIs for risky alcohol use (Akin, Johnson, Seale, & Kuperminc, 2012; Bien, Miller, & Tonigan, 1993; Heather, 1996) and more recently we have devised a successful intervention for illicit drug use that can be linked to the ASSIST (Humeniuk et al., 2012; Newcombe et al., 2005).

Moreover, given the advent of ehealth there is a move to place screening tools, such as the ASSIST online, and provide health messages that are linked to the results of the screening test (McNeely, Strauss, Rotrosen, Ramautar, & Gourevitch, 2016; White et al., 2010). However, without the presence and guidance of the administering clinician there is the potential for confusion concerning the wording and meaning of instructions and questions, hence the need to ensure that the language used is clear. Recently an audio computer-assisted self-interview version of the ASSIST has been created (McNeely et al., 2016) and found to be well accepted and feasible for self-administration, and valid in a sample of primary care patients (McNeely et al., 2016). This offers a viable alternative to the clinician administered version of the ASSIST that may also solve some of the potential concerns regarding the time it takes to administer the instrument and potential confusion over some of the instructions (McNeely et al., 2016; McNeely et al., 2014).

The present study has several limitations, primarily the sample size, and thus the number within certain drug categories (i.e., cannabis, cocaine, inhalants, sedatives, hallucinogens, opioids), was too small to calculate specificity and sensitivity for most substances. Indeed given the small numbers of participants in drug groups, other than alcohol, these results may be considered exploratory. Future research that focuses on recruiting sufficient numbers for the more commonly used illicit drugs, such as a cannabis and amphetamines (Ministry of Health, 2008, 2010), should be undertaken to extend this study. In addition, this was a cross sectional study and hence it was not possible to examine the predictive validity of the ASSIST in this context (Newcombe et al., 2005). We have plans to develop a specific BI for Pacific peoples that would be considered culturally appropriate and, that could be linked to the scores on this version of the ASSIST. This BI could be delivered by the health professional who carried out the screen and therefore would likely enhance the capability to engage with Pacific clientss. Despite the abovementioned limitations our findings suggest that the ASSIST (Version 3.0r) could be used as a screening tool for problematic substance use for Pacific Peoples in the New Zealand context.

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Appendix 1. ASSIST (Version 3.0r)

Question		**Response alternatives**
Q1	In your life, which of the following substances have you ever used? (**NON-MEDICAL USE ONLY)** Q1a, tobacco products (cigarettes, rollies, smokes, chewing tobacco, cigars); Q1b, alcoholic beverages (beer, wine, spirits, home brew, RTD's); Q1c, cannabis (marijuana, pot, weed, ganja, mary jay, grass, tinny); Q1d, cocaine (coke, powder, crack) ;Q1e, amphetamine-type-stimulants (P, ice, crystal meth, ecstasy); Q1f, inhalants (BP, Shell, solvents, nitrous, glue bag, petrol, thinners); Q1g, sedatives or sleeping pills (Downers, Valium, Serepax); Q1h, hallucinogens (Party Pills, LSD, Acid, mushies, PCP, Special K); Q1i, opioids (done/methadone, neurofin, homebake, morphine, codeine); Q1j kava; Q1k 'other drugs	0 =no, 1 =yes
Q2	In the past 3 months, how often have you ever used the substances you mentioned (first drug, second drug, etc.)?	0 =Never 1 =Once or twice 2 =Weekly 3 =Monthly 4 =Daily or almost daily
Q3	During the past 3 months, how often have you had a strong desire or urge to use (first drug, second drug, etc.)?	0 =Never 1 =Once or twice 2 =Weekly 3 =Monthly 4 =Daily or almost daily
Q4	During the past 3 months, how often has your use of (first drug, second drug, etc.) led to health, social, legal or financial (*money*) problems?	0 =Never 1 =Once or twice 2 =Weekly 3 =Monthly 4 =Daily or almost daily
Q5	During the past 3 months, how often have you failed to do what was normally expected of you because of your use of (first drug, second drug, etc.)?	0 =Never 1 =Once or twice 2 =Weekly 3 =Monthly 4 =Daily or almost daily
Q6	Has a friend of relative or anyone else ever expressed concern *(worry*) about your use of (first drug, second drug, etc.)?	0 =No, never 2 =Yes, in the past 3 months 1 =Yes, but not in the past 3 months
Q7	Have you ever tried to control, cut down or stop using (first drug, second drug, etc.)?	0 =No, never 2 =Yes, in the past 3 months 1 =Yes, but not in the past 3 months
Q8	Have you ever used any drug by injection? (non-medical use only)	0 =No, never 2 =Yes, in the past 3 months 1 =Yes, but not in the past 3 months

Notes: For questions 2 to 5. *Never*: refers to not used in last three months. *Once or twice*: refers to using 1-2 times in last 3 months. *Weekly*: refers to using 1-4 times per week. *Monthly*: refers to 1-3 times in 1 month. *Daily or almost daily*: refers to using 5-7 times a week. ASSIST (Version 3.0r) is a modified version of the ASSIST (version 3.0) http://www.who.int/substance_abuse/activities/assist_v3_english.pdf