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CP 13

Effectiveness of a future substance use risk reduction intervention among secondary school students in the Jaffna district; A quasi-experimental study

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Abstract

Background and objective: Substance use among school-going adolescents is a major public health issue that has grave health impacts and wide-ranging socio-cultural and economic implications. Appropriate preventive measures are imperative to prevent substance use. This study assessed the effectiveness of a school-based life skills intervention to reduce future risk of substance use among secondary school students in the Jaffna District

Methods: A quasi-experimental study was conducted to assess the effectiveness of a life skills-based intervention among Grade 7 and 8 students from four selected national schools, who were assigned to the intervention (n=123) and control (n=131) arms. A constructively/factorially validated Substance Use Risk Profile Scale (SURPS) was used parallelly among control and intervention groups to assess baseline and post-intervention

differences, after adjusting the covariate pre-score. Ranked ANCOVA was used to assess the effectiveness of the intervention (significance level 0.05).

Results: The preventive intervention was effective in reducing impulsivity (F ratio=320.48; p=0.036) and sensation seeking (F ratio=171.44; p=0. 049) behaviour. We were unable to demonstrate its effectiveness in the domains of hopelessness (F ratio=35.24; p=0.106) and anxiety sensitivity (F ratio=31.86; p=0.112) behaviour. However, the interaction between sex and the intervention was found to be statistically significant in the anxiety sensitivity behaviour domain (F ratio=0.028; p=0.028).

Conclusion: Life skills-based training was effective in reducing future risk of substance in the impulsivity and sensation seeking domains. The interaction effect between anxiety sensitivity behaviour and sex suggests that the intervention plays out differently among males and females, and needs further exploration. It is recommended that the relevant stakeholders assess the appropriateness of the intervention for inclusion in school curricula in Sri Lanka.

Key words: Future substance use risk, Risk reduction intervention, Secondary school students, Jaffna district.

Introduction

Until the 1980s, psychoactive substance use was not a major issue in Sri Lanka, but with both the ethnic conflict and rapid social and economic policy changes, drug trafficking and the consumption of psychoactive substances has increased in Sri Lanka (1). Parallelly, the use of psychoactive substances among youth (15 to 24 years) has risen with approximately 15% reporting ever use (2) This figure is about 10% among school-going adolescents (3) and is reported to be about the same (9.6%) among A/L students in the Nallur Educational Zone in Jaffna district (4).

In recent years, substance use and related social and health problems have risen exponentially worldwide (5), including in Sri Lanka. Based on reports from the National Dangerous Drug Control Board of Sri Lanka, substance-related crimes and arrests are common with young people accounting for a large proportion (6). In 2022, there were over 1500 arrests in the Jaffna district (6) signalling the possibility of an increasing tendency of substance use among adolescents in the Jaffna district.

Adolescent brains are more sensitive to substances and the chances of addiction are greater compared with adults (7). A large body of literature shows that school-based interventions are effective in the prevention of psychoactive drug use and its adverse consequences among adolescents. Universal approaches that target the entire population may be delivered through existing systems and structures, and are known to be cost-effective and less intrusive, making them ideal for adoption in the school setting (8).

Life skills training (LST) has been identified as a substance use prevention strategy encompassing social competence and social influence-based approaches, and may be strengthened with healthy habit formation (9). Studies have demonstrated that LST is an effective school-based substance abuse prevention strategy. In fact, Buhler et al contend that LST is the "single most effective" substance abuse prevention strategy (10)

The National Dangerous Drugs Control Board has highlighted the lack of capacity to treat and rehabilitate substance users in Sri Lanka. Among its strategies to address substance-related issues is a programme to train teachers to facilitate a school-based preventive programme on substance use (11) This study aimed to assess the effectiveness of a school-based LST

intervention to reduce the future risk of substance use among secondary school students in the Jaffna district.

Methods

A quasi-experimental design was used. Based on evidence that school-based interventions among early adolescents are effective (12), Grade 7 and 8 students were selected as the study population. Students were randomly selected from national schools in the Jaffna district. A constructively/factorially validated Substance Use Risk Profile Scale (SURPS), with a 4-point Likert scale, was used parallelly, among control and intervention groups, to assess baseline and post-intervention differences, after base-line (covariate) adjustment. This 23-item tool measures four personality domains, namely, hopelessness, anxiety sensitivity, impulsivity and sensation seeking; measurements in each domain can be used to predict future risk of substance use (12).

Sample size was calculated as for a non-inferior design (13) based on the assumption that the intervention arm would not be inferior to the control arm since the intervention group was exposed to the intervention and the usual school curriculum, while the control arm was exposed only to the school curriculum.

$$N = 2((Z_{1-\alpha} + Z_{1-\beta})/\delta)^2 \, X\big(p \, X \, (1-p)\big)$$

The above formula was used to calculate the sample size because distribution and dispersion data for the four psychometric domain scores of SURPS tool were unavailable for school-going adolescents. The expected proportion with future risk of binge drinking (41%) was used as the proportion extracted from a study done among school-going adolescents in England (12) After adding a 10% loss to follow up rate, the sample size was calculated to be 106 students each in the intervention and control arms of the study.

Class rooms were selected from four national schools in Jaffna district. The average number of students in a class in national schools is 30 to 35. Hence, we selected 4 class rooms (4x30=120 students) each for the intervention and control arms. To avoid contamination, intervention and control schools were selected ensuring they were located at a distance from each other. In total, 254 students were assigned to the intervention (n=123) and control (n=131) arms of the study.

A brief intervention was designed to encompass social resistance skills training (SRST), normative education (NE) and competence enhancement skills training (CEST). Twelve biweekly brief interventions were conducted for six weeks starting mid-January 2020. SRST and CEST were implemented based on the facilitators' manual of a basic life skills course prepared by the Ministry of Youth and Sport Azerbaijan and UNICEF Azerbaijan (14) while NE was integrated using study materials prepared for the National Drug Prevention Week 2019 by the Presidential Task Force on drug prevention. The control group did not receive any specific intervention.

Ten medical students who had completed their 2nd MBBS exam and four BSc nursing students were trained to implement the study. As it was a quasi-experimental design, proper randomization was not carried out. Hence the pre-assessment score was treated as an independent continuous variable (covariate). Sex and intervention were treated as independent categorical variables; sex was selected as an independent variable because many studies suggest that sex influences substance use; interaction terms were also selected based on the literature.

Baseline and post-interventions scores were found to be not normally distributed. Hence, non-parametric statistical testing was chosen to determine the effect of the intervention. Rank analysis of ANCOVA (Analysis of Co-Variance) Quade's method was used as a non-

parametric alternative to ANCOVA. The dependent variable and covariate were ranked and linear regression performed between the ranks. Then unstandardized residues of rank linear regression were used to run ANCOVA (15–18). The baseline was considered as a covariate; the status of the intervention, sex, and an interaction term (sex*intervention) were assessed after controlling for the effect of the baseline.

Ethical clearance was gained from the Ethics Review Committee of the Faculty of Medicine, University of Jaffna (J/ERC/19/102/DR/0066).

Results

In total, 123 and 131 students participated in the intervention and non-intervention groups, respectively. Table 1 depicts the breakdown of participants by age, grade and sex.

Table 1. Participant characteristics

		Intervention group (n, %)	Non-intervention group (n, %)
Age (in years)	11	59 (48.0)	66 (50.4)
	12	62 (50.4)	65 (49.6)
	13	2 (1.6)	0 (0.0)
Grade	Seven	63 (51.2)	66 (50.4)
	Eight	60 (48.8)	65 (49.6)
Sex	Female	65 (52.8)	63 (48.1)
	Male	58 (47.2)	68 (51.9)
Total		123	131

Table 2 shows the basic distribution of domain scores before and after the intervention among intervention and control arms. Dispersions of scores are not equal among domains or by intervention status indicating the need for non-parametric analysis.

Table 2. Pre- and post-intervention SURPS scores by intervention status and domain

Status of intervention Yes (n=123) No (n=131)	SURPS psychometric domain score	Pre-intervention	Post-intervention
	Hopelessness		
Yes	Mean	13.02	11.94
	Std. deviation	2.38	1.90
No	Mean	14.11	14.35
	Std. deviation	4.96	4.60
	Anxiety sensitivity		
Yes	Mean	12.57	12.33
	Std. deviation	2.92	2.80
No	Mean	11.37	11.17
	Std. deviation	5.12	4.87
	Impulsivity		
Yes	Mean	11.37	10.61
	Std. deviation	2.37	2.00
No	Mean	12.45	12.24
	Std. deviation	4.38	4.15
	Sensation seeking		
Yes	Mean	15.57	14.77
	Std. deviation	3.18	2.87
No	Mean	14.73	14.43
	Std. deviation	6.16	5.96

The LST-based intervention showed effectiveness in reducing the future risk of substance use in relation to the impulsivity and sensation seeking personality domains. Table 3 shows statistically significant differences between the intervention and controls groups after controlling for the effect of the pre-score (base-line), sex and interaction term.

Table 3. Effect of the intervention in the domains of impulsivity and sensation seeking

		df	Impulsivity				Sensation seeking			
			Sum of squares	Mean square	F ratio	p value	Sum of squares	Mean square	F ratio	p value
Intercept	Hypothesis	1	11.40	11.40	1.99	0.393	0.63	0.63	0.01	0.953
	Error	1	5.73	5.73			113.77	113.77		
Intervention	Hypothesis	1	11035.72	11035.72	320.48	**0.036**	1625.86	1625.86	171.44	**0.049**
	Error	1	34.44	34.44			9.48	9.48		
Sex	Hypothesis	1	6.74	6.74	0.17	0.753	113.77	113.77	11.99	0.179
	Error	1	34.44	34.44			9.84	9.84		
Intervention *sex	Hypothesis	1	34.44	34.44	0.12	0.728	9.84	9.84	0.06	0.810
	Error	250	71258.75	285.04			40896.71	163.59		

However, in the hopelessness and anxiety sensitivity personality domains the LST-based intervention did not show effectiveness (Table 4). Even so, the interaction between sex and intervention in the anxiety sensitivity domain was found to be statistically significant.

Table 4. Effect of the intervention in the domains of hopelessness and anxiety sensitivity

		df	Hopelessness				Anxiety sensitivity			
			Sum of squares	Mean square	F ratio	p value	Sum of squares	Mean square	F ratio	p value
Intercept	Hypothesis	1	60.83	60.83	0.14	0.772	0.33	0.33	<0.01	0.979
	Error	1	434.01	434.01			312.60	312.60		
Intervention	Hypothesis	1	84756.46	84756.46	35.24	0.106	76.63	76.63	31.86	0.112
	Error	1	2404.90	2404.90			2.41	2.41		
Sex	Hypothesis	1	434.01	434.01	0.18	0.744	312.60	312.60	129.97	0.056
	Error	1	2404.90	2404.90			2.41	2.41		
Intervention *sex	Hypothesis	1	2404.90	2404.90	3.20	0.075	2.41	2.41	0.028	**0.028**
	Error	250	187863.70	751.46			21478.38	85.91		

Discussion
The findings of this quasi-experimental study show that this LST-based intervention may be used to improve the personality domains of impulsivity and sensation seeking in view of reducing the future risk of substance use. The effect of the intervention on hopelessness and anxiety sensitivity domains was not significant with a p value around 0.1, indicating the need for a randomized controlled trial (RCT) to reassess the effectiveness of this intervention.
One salient point, however, is that the effect of the interaction (sex*intervention) term on the anxiety sensitivity domain suggests that the intervention played out differently among males and females. This phenomenon is consistent with a study conducted in France, were predicting cannabis use frequency with the SURPS anxiety sensitivity domain score showed a statically significant interaction with sex (19). This phenomenon needs further exploration.

A primary setback of this study was that the second post-intervention assessment that was planned for three months after the intervention could not be conducted due to the COVID-19 pandemic. After the lockdowns, schools did not function properly for more than a year, and when they functioned, the entry of external individuals was restricted.

Conclusions
Life skills-based training appears to be effective in reducing future risk of substance in the impulsivity and sensation seeking domains. It is recommended that the relevant stakeholders assess the appropriateness of the intervention for inclusion in school curricula in Sri Lanka.

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Conflict of interest
The authors have no conflicts of interest to declare.

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CP 14

Potential pharmacokinetic drug-drug interactions in patients attending medical clinics at Teaching Hospital Jaffna: A prescription analysis

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Abstract

Background and objective: Patients with chronic medical conditions often take multiple medications and are at the risk of developing clinically significant drug-drug interactions (DDI). Many DDI alter pharmacokinetics and thereby the effects of medications. This prescription analysis aimed to describe the potential pharmacokinetic DDI and associated factors among patients attending medical clinics at Teaching Hospital Jaffna.

Methods: This was a descriptive cross-sectional study. As per the sample size recommended by the World Health Organization for prescription analysis, we analysed 600 prescriptions of patients attending medical clinics at Teaching Hospital Jaffna. Systematic sampling was used to select the prescriptions from all clinics. British National Formulary (BNF edition 80) was used as the pharmaceutical reference to identify pharmacokinetic DDI and categorise them as mild, moderate and severe. Chi-square test was used to determine the association between age, sex and polypharmacy (≥5 drugs) and the presence of pharmacokinetic DDI (critical value 0.05).

Results: Of the 600 prescriptions, the majority belonged to females (n= 327; 54.5%). Mean age was 57.5 (SD=14.6) years. A total of 112 potential pharmacokinetic DDI were identified in 86 (14.3%) prescriptions. Of them, 49 (43.8%) were moderate and 63 (56.2%) were severe DDI. Cardiovascular drugs contributed the majority of DDI (85%). The presence of potential pharmacokinetic DDI was statistically associated with age (p=0.01) and polypharmacy (p<0.001), but not sex. Prescriptions of older patients and those prescribed ≥5 drugs were more likely to contain potential pharmacokinetic DDI.

Conclusion: Patients attending the medical clinics are at risk of developing clinically significant pharmacokinetic DDI. While cardiovascular medications account for a large number of potential pharmacokinetic DDI, elderly patients exposed to polypharmacy may be at greater risk. Raising awareness among doctors, regular prescription review and closely monitoring those at risk may help to reduce the occurrence of clinically significant DDI.