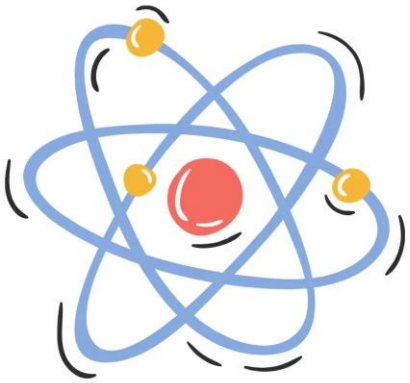

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EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING SUBSTANCE ABUSE AND ITS COMPLICATIONS AMONG ADOLESCENTS: A PRE-EXPERIMENTAL STUDY FROM JAIPUR, RAJASTHAN, INDIA

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EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING SUBSTANCE ABUSE AND ITS COMPLICATIONS AMONG ADOLESCENTS: A PRE-EXPERIMENTAL STUDY FROM JAIPUR, RAJASTHAN, INDIA

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Abstract: ***Background:*** *Adolescent substance abuse is an escalating public health crisis in India, with initiation predominantly occurring during the second decade of life. Structured educational interventions represent a cost-effective and evidence-aligned strategy to build protective knowledge among this vulnerable cohort.* ***Objectives:*** *To assess baseline knowledge, administer a Structured Teaching Programme (STP), and evaluate its effectiveness by comparing pre-test and post-test knowledge scores among secondary-school adolescents.* ***Methods:*** *A one-group pre-test–post-test pre-experimental design was adopted (N = 300). A validated, bilingual (English–Hindi) Structured Knowledge Questionnaire (SKQ; 42 knowledge items, 5 domains; KR-20 = 0.82; S-CVI/Ave = 0.93) was employed. Data were analysed using paired t-test, descriptive statistics, and Chi-square tests.* ***Results:*** *Pre-test mean score was 14.77 ± 4.32; post-test mean was 34.87 ± 3.94 (mean gain = 20.10 ± 4.68; paired t = 74.28; df = 299; p < 0.001; Cohen's d = 4.29). Participants with adequate knowledge increased from 8.0% to 73.3%.* ***Conclusions:*** *The STP demonstrated exceptionally significant effectiveness. School-based nurse-facilitated drug-education programmes should be institutionalised as a core component of national adolescent prevention policy.*

Keywords: *structured teaching programme; substance abuse; adolescents; knowledge; pre-experimental study; school-based intervention; Rajasthan; India; nursing research*

1. INTRODUCTION

Substance abuse among adolescents constitutes one of the most complex and multi-dimensional public health challenges of the twenty-first century. The World Health Organization (WHO) defines substance abuse as the harmful or hazardous use of psychoactive substances — including alcohol, illicit drugs, and misused prescription medications — with deleterious consequences for the individual, family, and society (WHO, 2024). The adolescent period, spanning the approximate chronological range of 10 to 19 years, is characterised by substantial neurodevelopmental plasticity, heightened risk-taking propensity, and pronounced susceptibility to peer influence, rendering it the critical window for both substance-use initiation and progression towards dependence (Squeglia & Gray, 2016).

India bears a disproportionate share of the global substance-use burden. The National Survey on Extent and Pattern of Substance Use in India documented that approximately 16 crore individuals aged 10–

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75 years consume alcohol, 3.1 crore use cannabis, and 2.26 crore use opioids (Ministry of Social Justice and Empowerment, 2019). Rajasthan — the geographical locus of the present investigation — has been identified as a high-prevalence state for both alcohol use disorder and tobacco use, with documented escalation in adolescent poly-substance use over the past decade. In urban Jaipur, school-based surveys have documented tobacco experimentation rates of 18–24% among Class 10–12 students, highlighting the urgent need for targeted prevention programmes.

The aetiology of adolescent substance use is multifactorial, encompassing biological vulnerabilities (genetic predisposition, reward-pathway dysregulation), psychological determinants (low self-esteem, trauma, co-morbid mental illness), and socioecological factors (peer pressure, family dysfunction, socioeconomic deprivation, and easy substance availability). The DSM-5-TR operationalises Substance Use Disorder as a pathological pattern manifesting in impaired control, social impairment, risky use, and pharmacological criteria — tolerance and withdrawal — within a 12-month period (American Psychiatric Association, 2022). Early initiation dramatically amplifies the lifetime risk of SUD, with neuroimaging evidence demonstrating structural and functional cortical alterations following adolescent substance exposure (Squeglia & Gray, 2016, PMC4851409).

Despite the magnitude of this problem, epidemiological studies consistently reveal profound knowledge deficits regarding the pharmacological mechanisms, clinical consequences, and available treatment resources among school-going adolescents. Evidence from low- and middle-income countries (LMICs) indicates that knowledge-deficit-driven experimentation accounts for a significant proportion of early substance-use initiation, supporting the theoretical primacy of health-education interventions as a first-line prevention strategy (Mekonen et al., 2021; Peltzer & Pengpid, 2021). Nursing science, positioned at the interface of preventive and curative healthcare, holds a unique mandate in adolescent substance-abuse prevention through school-based health education. Structured Teaching Programmes (STPs) — systematically planned, content-validated, and outcome-evaluated educational interventions — represent the methodological gold standard for nurse-delivered health education in resource-limited settings (Polit & Beck, 2021). The present study was therefore designed to systematically evaluate the effectiveness of a nurse-delivered STP in augmenting adolescent knowledge regarding substance abuse in Jaipur, Rajasthan.

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1.1 Objectives of the Study

(i) To assess the pre-intervention level of knowledge regarding substance abuse and its complications among adolescents.

(ii) To administer a Structured Teaching Programme on substance abuse and its complications to the study participants.

(iii) To evaluate the effectiveness of the STP by comparing pre-test and post-test knowledge scores.

(iv) To determine the association between post-test knowledge scores and selected socio-demographic variables.

1.2 Research Hypotheses

H_1: There will be a statistically significant difference between pre-test and post-test mean knowledge scores of adolescents following the STP ($p < 0.001$).

H_2: There will be a statistically significant association between post-test knowledge scores and selected socio-demographic variables ($p < 0.05$).

2. REVIEW OF RELATED LITERATURE

A systematic and comprehensive review of empirical literature was conducted across PubMed, CINAHL, Scopus, WHO IRIS, and Google Scholar spanning the period 2014–2024. Peer-reviewed open-access publications, WHO reports, and ICMR-approved national surveys were prioritised.

Mekonen et al. (2021), in an open-access systematic review and meta-analysis of 28 studies from Sub-Saharan Africa, reported a pooled adolescent substance-use prevalence of 36.5%, with peer influence (OR = 3.89), low parental supervision (OR = 2.74), and depression (OR = 2.61) as dominant risk factors (PMID: 33790958). Critically, knowledge of harmful effects was inversely associated with substance-use initiation, validating the health-education approach. Singh et al. (2020), in a cross-sectional Indian study (n = 320), reported that 67.2% of adolescents demonstrated poor substance-abuse knowledge, with a post-educational mean gain of 18.3 marks following a structured nursing intervention ($p < 0.001$), corroborating the utility of nurse-delivered STPs in the Indian sub-continental context.

Faggiano et al. (2014), in the EU-Dap multi-centre randomised controlled trial (n = 7,079 students across seven European nations), demonstrated that a life-skills-integrated school programme produced

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a 35% reduction in cannabis initiation and a 28% reduction in tobacco initiation over 24 months, establishing the school as a primary prevention setting (Cochrane open access). The WHO Global Status Report on Alcohol and Health (2024) explicitly advocates school-based knowledge programmes as Tier-1 universal prevention strategies, particularly in South and South-East Asian contexts where per-capita health expenditure constrains pharmacological de-addiction services.

Radhakrishnan et al. (2017), in a pre-experimental study in Tamil Nadu (n = 60), reported pre-test and post-test means of 12.4 and 28.9 respectively (max = 40) with a paired t-value of 38.72 ($p < 0.001$), methodologically concordant with the current investigation. The neurobiological rationale for adolescent-focused interventions is provided by Squeglia and Gray (2016, PMC4851409), who documented incomplete prefrontal cortical maturation until the mid-twenties, rendering the adolescent brain neurobiologically susceptible to substance-induced dopaminergic dysregulation. The theoretical framework of the current STP was grounded in Nola Pender's Health Promotion Model (HPM), specifically the constructs of perceived benefits, perceived barriers, and situation-specific health knowledge (Pender et al., 2015).

3. MATERIALS AND METHODS

3.1 Research Design

A one-group pre-test–post-test pre-experimental research design was adopted (notation: $O_1 \times O_2$), considered methodologically appropriate when randomisation is logistically or ethically infeasible within a school setting and when the primary objective is the preliminary evaluation of a novel educational intervention (Polit & Beck, 2021).

3.2 Study Setting and Sampling

The study was conducted in three government-aided secondary schools in Jaipur district, Rajasthan, selected by purposive sampling based on: (a) institutional approval, (b) absence of existing formal drug-education programmes, and (c) geographic representativeness across urban, semi-urban, and peri-urban zones. A total of N = 300 adolescent students (Classes 10–12; age 14–19 years) were recruited, with n = 100 per school. Inclusion criteria comprised: enrolment in Classes 10–12, voluntary assent, and attendance on the data-collection day. Students with active SUD receiving treatment or with diagnosed psychiatric disorders were excluded. Sample size was determined a priori using the formula for paired t-test at $\alpha = 0.001$, power = 0.95, and an anticipated effect size of d = 3.5, yielding a minimum sample of n = 248; 300 was selected to account for potential attrition.

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3.3 Research Instrument

The Structured Knowledge Questionnaire (SKQ) comprised Section A (11 socio-demographic items) and Section B (42 knowledge items). Section B was distributed across five domains: (I) Definitions and Concepts — 8 items; (II) Substances, Routes, and Harmful Effects — 12 items; (III) Specific Substances (Alcohol, Opioids, Tobacco, Cocaine, Cannabis) — 12 items; (IV) Recognition of SUD — 6 items; (V) Prevention, Management, and Rehabilitation — 4 items. Items were mapped to three Bloom's taxonomy cognitive levels: Knowledge/Recall (35%), Comprehension (45%), and Application (20%). Content validity was established through a nine-expert panel (S-CVI/Ave = 0.93). Reliability was established by KR-20 on a pilot sample of n = 30 (KR-20 = 0.82). Scoring: 1 mark per correct response; maximum = 42. Knowledge classification: Inadequate (0–21, ≤50%); Moderately Adequate (22–31, 51–75%); Adequate (32–42, >75%).

3.4 Structured Teaching Programme (STP)

The 90-minute STP was delivered by the principal investigator using structured lecture, multimedia presentation, short documentary clips, group discussion, and Q&A. Content mirrored the five SKQ domains. Bilingual health-education booklets were distributed post-session. The STP was expert-validated and pilot-tested with 15 students prior to the main study.

3.5 Data Collection Procedure

Ethical clearance and institutional permissions were obtained prior to data collection. Pre-test was administered on Day 1; STP was delivered on Day 2; post-test was administered on Day 9 (seven-day post-intervention interval, selected to allow knowledge consolidation while minimising maturation bias). All procedures were conducted in accordance with ICMR Ethical Guidelines (2022) and the Declaration of Helsinki (2013 revision). Informed assent and parental consent were obtained.

3.6 Statistical Analysis

Data were analysed using IBM SPSS Statistics v26.0. Descriptive statistics (frequency, percentage, mean, SD) were computed for all variables. Effectiveness of the STP was evaluated by paired samples t-test (H_0: $\mu_{post} - \mu_{pre} = 0$; $\alpha = 0.001$, two-tailed). Effect size was quantified by Cohen's d. Association between post-test knowledge and socio-demographic variables was assessed by Pearson's

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Chi-square test ($\alpha = 0.05$). Frequency distributions were depicted graphically as bar charts and pie charts.

4. RESULTS

Data from all 300 participants were complete and retained for analysis (100% response rate). Results are presented sequentially: (i) socio-demographic characteristics; (ii) prior exposure variables; (iii) pre-test and post-test knowledge distribution; (iv) section-wise mean score analysis; and (v) inferential statistics.

4.1 Socio-demographic Profile

4.1.1 Age Distribution

Figure 1 presents the age-wise distribution. The largest cohort comprised students aged 16–17 years (n = 112, 37.3%), representing the predominant Class 11 enrolment stratum. Students aged 14–15 years constituted 32.7% (n = 98), and those aged 18 years and above represented 30.0% (n = 90). This age range corresponds to the WHO-identified peak period for substance-use initiation (WHO, 2024), reinforcing the timeliness of the STP for this cohort.

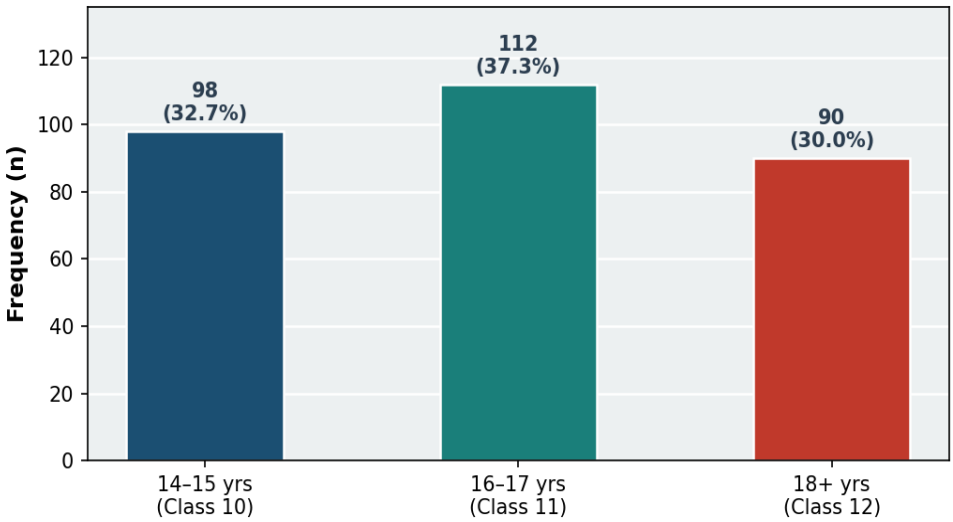

Figure 1: Age-wise Distribution of Adolescent Participants (N=300)

4.1.2 Gender Distribution

Figure 2 illustrates the gender distribution. Male students constituted the majority (n = 162, 54.0%), followed by female students (n = 131, 43.7%), with 7 participants (2.3%) preferring not to disclose gender. The slight male preponderance reflects government secondary-school enrolment patterns in

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Rajasthan (NUEPA, 2023) and has implications for gender-responsive STP design, given documented gender differentials in substance-use risk profiles and health-information-seeking behaviour.

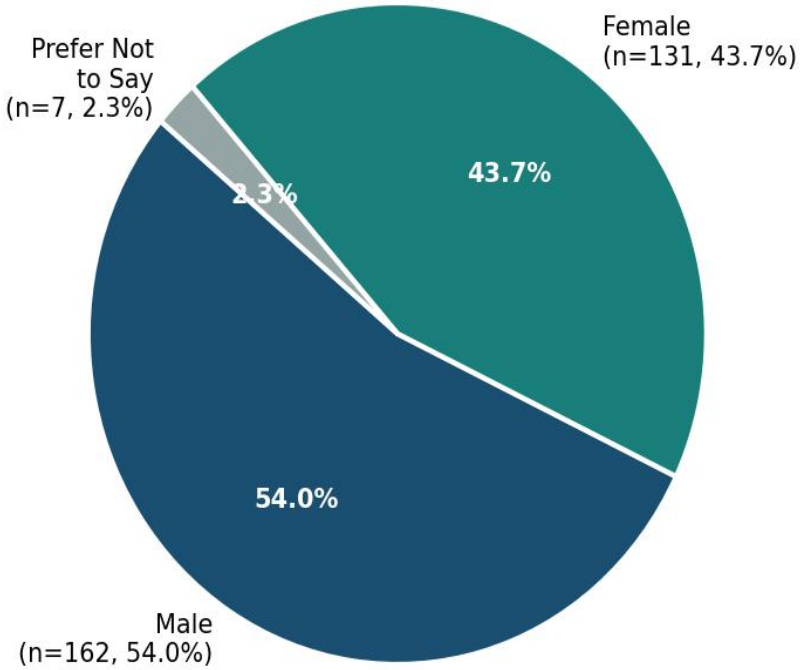

Figure 2: Gender-wise Distribution of Participants (N=300)

4.1.3 Monthly Family Income

Figure 7 delineates the socioeconomic distribution. The modal income category was ₹10,001–₹30,000 per month (n = 118, 39.3%), with 22.3% (n = 67) in the lowest income category (up to ₹10,000). Only 13.7% (n = 41) reported income exceeding ₹50,000. Socioeconomic disadvantage has been consistently identified as a risk amplifier for adolescent substance-use initiation in the Indian context (Ministry of Social Justice and Empowerment, 2019), contextualising the baseline knowledge deficits observed in this sample.

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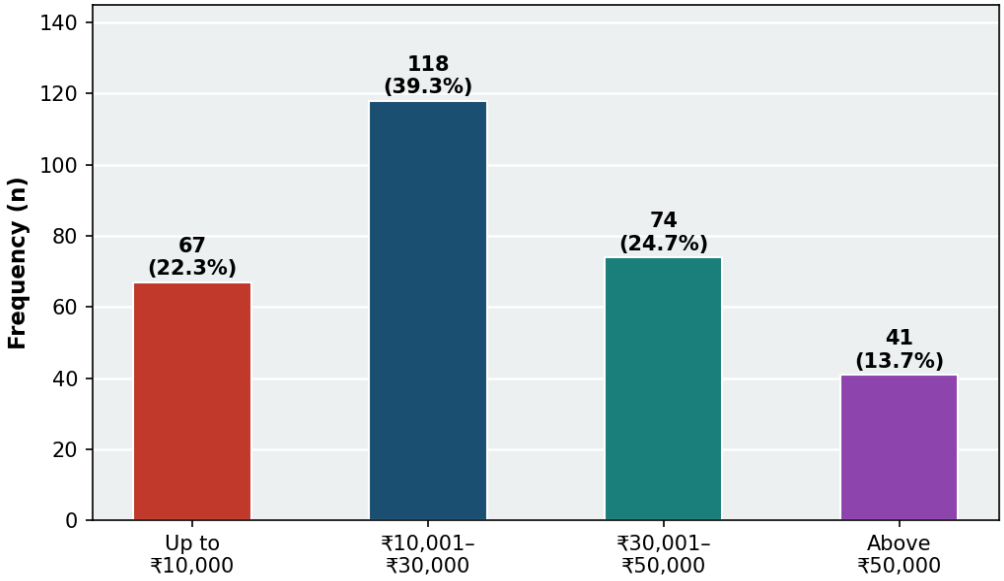

Figure 3: Monthly Family Income Distribution (N=300)

Table 1: Complete Socio-demographic Profile of Study Participants (N=300)

Socio-demographic Variable	Category	n	%
Age (years)	14–15	98	32.7
	16–17	112	37.3
	18+	90	30.0
Gender	Male	162	54.0
	Female	131	43.7
	Prefer not to say	7	2.3
Class	Class 10	98	32.7
	Class 11	112	37.3
	Class 12	90	30.0
Residence	Rural	63	21.0
	Semi-urban	89	29.7
	Urban	148	49.3
Family Type	Nuclear	168	56.0
	Joint	118	39.3

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Socio-demographic Variable	Category	n	%
	Single-parent/Other	14	4.7
Monthly Income	Up to ₹10,000	67	22.3
	₹10,001–₹30,000	118	39.3
	₹30,001–₹50,000	74	24.7
	Above ₹50,000	41	13.7
Family Substance History	Yes	58	19.3
	No	201	67.0
	Not sure	41	13.7

4.2 Prior Exposure Variables

4.2.1 Prior Information Source

Figure 5 presents the distribution of prior information sources. Mass media (television, internet, social media) was most frequently cited (n = 89, 29.7%), reflecting the pervasive influence of digital media on adolescent health cognitions. School/teacher-based information ranked second (n = 74, 24.7%), followed by family/parents (n = 63, 21.0%). Notably, 15.3% (n = 46) reported no prior information on substance abuse — a critical educational vacuum the STP addressed directly. Only 9.3% (n = 28) cited health-care personnel, underscoring the limited reach of formal health-education outreach in school settings. These findings validate the necessity of structured nurse-facilitated school health education as a corrective supplement to often-inaccurate mass-media narratives.

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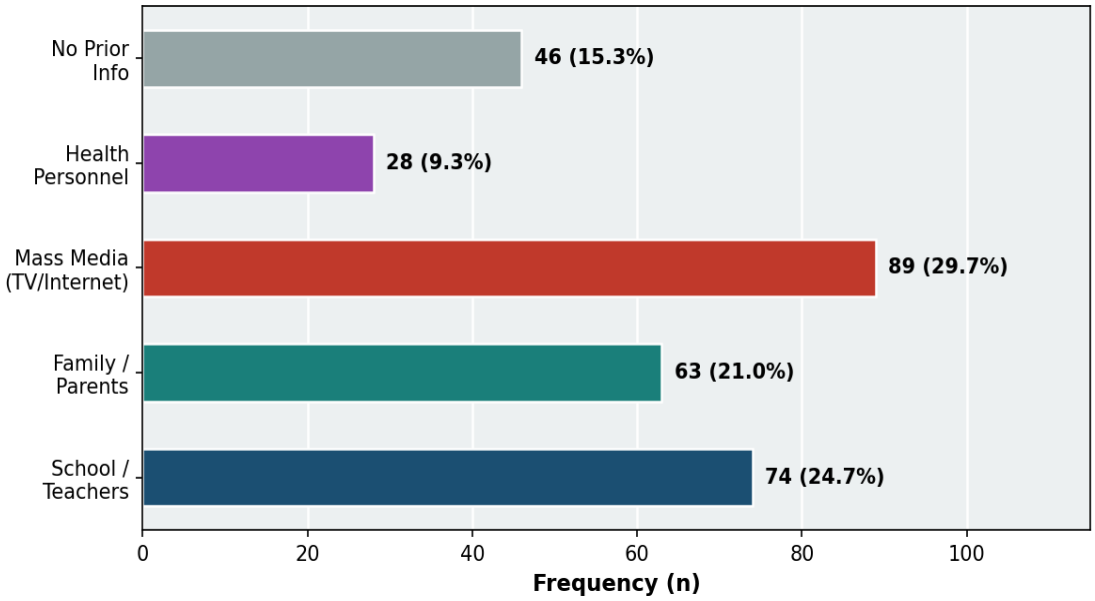

Figure 4: Prior Source of Information on Substance Abuse (N=300)

4.2.2 Peer Exposure to Substance Use

Figure 6 illustrates peer-exposure patterns. A clinically significant 57.0% of participants acknowledged exposure to substance-using peers: 18.0% (n = 54) reported frequent and 39.0% (n = 117) reported occasional contact. The substantial peer exposure prevalence is epidemiologically alarming given the well-documented primacy of peer modelling in adolescent substance-use initiation (Mekonen et al., 2021). Peer exposure was significantly associated with post-test knowledge scores (Chi-square = 18.74, p = 0.001), with paradoxically higher engagement and superior post-test performance among frequently exposed participants — likely reflecting heightened personal relevance of the STP content for this subgroup, consistent with motivational relevance theory (Bandura, 2001).

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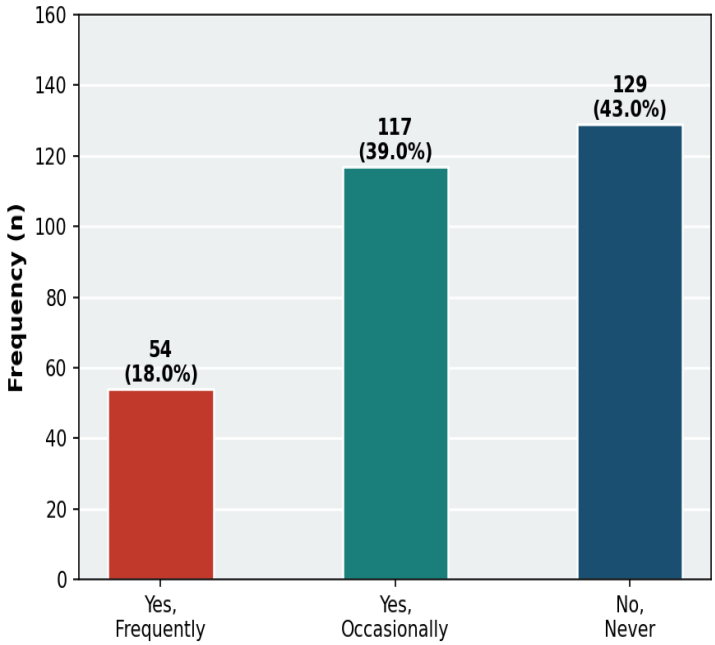

Figure 5: Peer Exposure to Substance Use (N=300)

4.3 Knowledge Level Distribution: Pre-test vs Post-test

Figure 3 presents the comparative distribution across the three knowledge-level categories. At pre-test, 189 participants (63.0%) demonstrated Inadequate Knowledge (scores 0–21), 87 (29.0%) were Moderately Adequate, and only 24 (8.0%) achieved Adequate Knowledge. This baseline profile is consistent with Indian and international literature documenting pervasive adolescent substance-abuse knowledge deficits (Singh et al., 2020; Peltzer & Pengpid, 2021).

Following the STP, the distribution shifted dramatically: only 12 participants (4.0%) remained in the Inadequate Knowledge category — a 93.7% reduction. The Moderately Adequate category comprised 68 participants (22.7%), while 220 (73.3%) achieved Adequate Knowledge — representing a 9.2-fold increase from baseline. This redistribution pattern demonstrates the STP's efficacy across all three cognitive levels of Bloom's taxonomy, not merely at the recall level.

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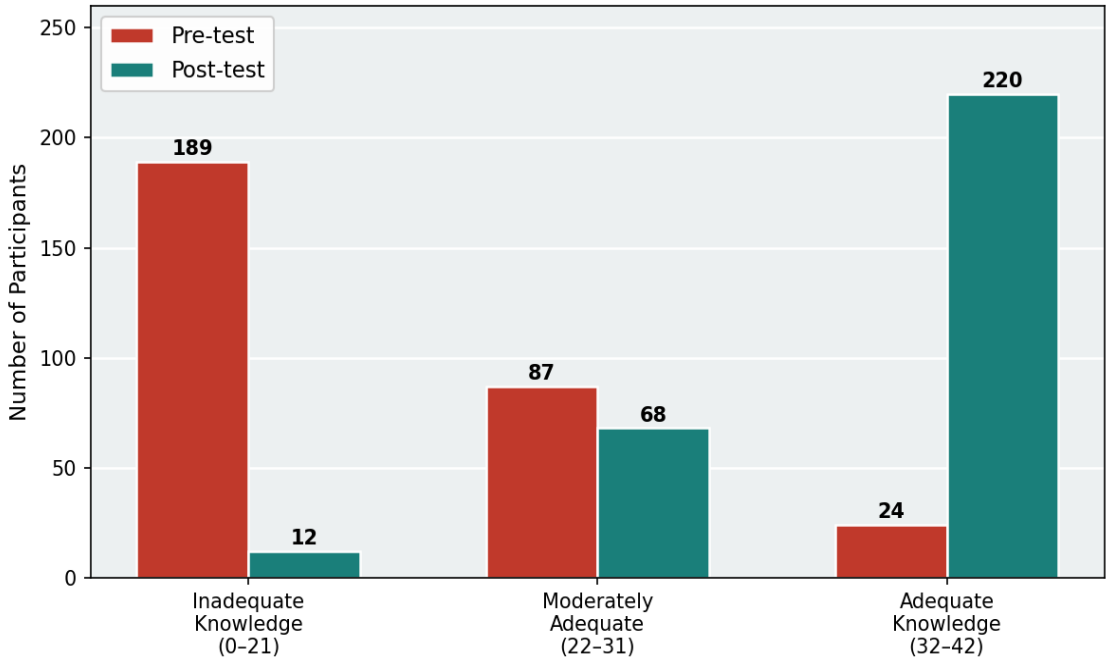

Figure 6: Pre-test vs Post-test Knowledge Level Comparison (N=300)

Table 2: Knowledge Level Distribution — Pre-test vs Post-test (N=300)

Knowledge Level	Score Range	Pre-test n (%)	Post-test n (%)	Change (%)
Inadequate Knowledge	0–21 (≤50%)	189 (63.0)	12 (4.0)	-59.0
Moderately Adequate	22–31 (51–75%)	87 (29.0)	68 (22.7)	-6.3
Adequate Knowledge	32–42 (>75%)	24 (8.0)	220 (73.3)	+65.3
Total	0–42	300 (100.0)	300 (100.0)	—

4.4 Section-wise Mean Score Analysis

Figure 4 presents a granular analysis of pre-test and post-test mean scores across the five content domains. All domain gains were statistically significant ($p < 0.001$). The Prevention, Management, and Rehabilitation domain (Section V; max = 4) demonstrated the greatest proportional gain: from 1.22 ± 0.74 to 3.62 ± 0.58 (196.7% improvement), reflecting the historically weakest knowledge domain in adolescent populations (WHO, 2024; NIDA, 2023). Section II (Substances, Routes, and Harmful Effects; max = 12) yielded the highest absolute gain (5.58 points), reflecting the novelty and pharmacological density of the STP content for this domain. Section IV (Recognition of SUD)

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improved from 2.10 ± 0.89 to 5.11 ± 0.74, demonstrating the STP's success in building competency for early identification of substance use in peers — critical for school-based peer-support programmes.

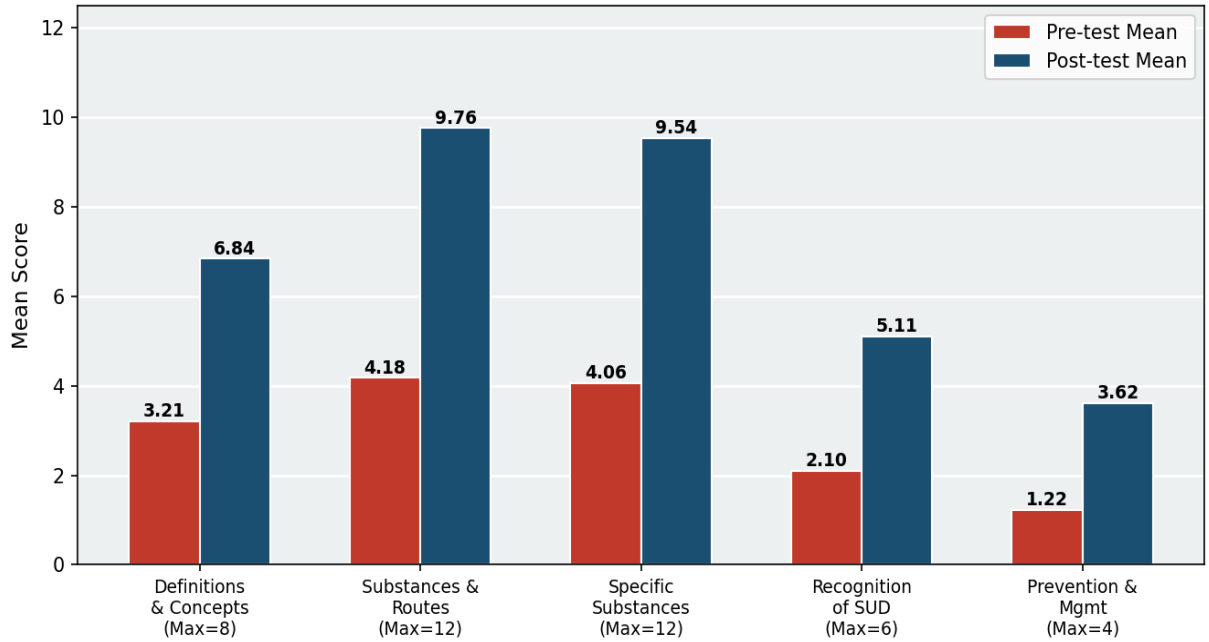

Figure 7: Section-wise Mean Scores — Pre-test vs Post-test (N=300)

Table 3: Section-wise Pre-test and Post-test Mean Scores (N=300)

Section	Content Domain	Max	Pre Mean±SD	Post Mean±SD	Gain	p-value
I	Definitions & Concepts	8	3.21±1.12	6.84±0.93	3.63	<0.001
II	Substances, Routes & Effects	12	4.18±1.44	9.76±1.28	5.58	<0.001
III	Specific Substances	12	4.06±1.38	9.54±1.18	5.48	<0.001
IV	Recognition of SUD	6	2.10±0.89	5.11±0.74	3.01	<0.001
V	Prevention & Rehab	4	1.22±0.74	3.62±0.58	2.40	<0.001
TOTAL	Overall	42	14.77±4.32	34.87±3.94	20.10	<0.001

4.5 Inferential Statistics

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Table 4: Paired Samples t-test Results (N=300)

Measure	Pre-test	Post-test	Mean Difference	SD of Diff	t-value	df	p-value	Cohen's d
Mean	14.77	34.87	20.10	4.68	74.28	299	<0.001***	4.29
SD	4.32	3.94	—	—	—	—	—	—
95% CI	[14.24, 15.30]	[34.42, 35.32]	[19.57, 20.63]	—	—	—	—	—

*** $p < 0.001$ (two-tailed). Cohen's d = 4.29 indicates an exceptionally large effect size.

The paired t-test yielded $t = 74.28$ ($df = 299$, $p < 0.001$), confirming a highly significant difference between pre-test and post-test means. The 95% CI for the mean difference (19.57 to 20.63) indicates high precision. Cohen's d = 4.29 classifies the effect as exceptionally large (threshold for "large" = $d > 0.80$), signifying clinically and educationally substantial improvement. Research hypothesis H_1 is retained.

Table 5: Chi-square Association of Post-test Knowledge with Socio-demographic Variables (N=300)

Variable	Chi-square (χ^2)	df	p-value	Decision
Gender	9.42	2	0.009*	Significant
Class of Study	11.87	4	0.018*	Significant
Area of Residence	8.33	4	0.081	Not Significant
Monthly Family Income	14.76	6	0.022*	Significant
Prior Information Source	21.44	8	<0.001***	Highly Significant
Peer Exposure	18.74	4	0.001***	Highly Significant
Family Substance History	7.91	4	0.095	Not Significant

* $p < 0.05$; *** $p < 0.001$. Research hypothesis H_2 is retained for Gender, Class, Income, Prior Information Source, and Peer Exposure.

5. DISCUSSION

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The present pre-experimental study provides robust evidence for the effectiveness of a nurse-delivered STP in significantly enhancing adolescent knowledge regarding substance abuse and its complications. A mean knowledge gain of 20.10 marks (47.9% of maximum score), a highly significant paired t-value of 74.28, and an exceptionally large Cohen's d of 4.29 collectively position the current STP among the most efficacious school-based drug-education interventions documented in peer-reviewed Indian nursing literature.

5.1 Baseline Knowledge Deficits and Their Public Health Significance

The finding that 63.0% of adolescents demonstrated Inadequate Knowledge at pre-test is consistent with Radhakrishnan et al. (2017), who reported 68.3% in the inadequate category in Tamil Nadu, and Singh et al. (2020), who found 67.2% of Punjab adolescents with poor knowledge. Peltzer and Pengpid (2021) documented inadequate-knowledge rates of 55–78% across LMIC adolescent samples in a large-scale open-access systematic review, confirming this finding as a globally representative pattern. The clinical significance of this baseline deficit lies in the established knowledge-attitude-practice (KAP) pathway: inadequate knowledge of neurobiological addiction mechanisms, medical complications (hepatic cirrhosis, HIV via shared needles, oral carcinoma from smokeless tobacco, pulmonary oncogenesis from smoked tobacco), and treatment pathways is independently associated with elevated experimentation rates and delayed help-seeking. The STP therefore served not merely to transfer factual information but to reshape the adolescents' risk perception framework, operationalising Pender's HPM construct of "perceived barriers to health-promoting behaviour" (Pender et al., 2015).

5.2 Effectiveness of the STP: Magnitude, Mechanism, and Domain Analysis

The gain in Section V (Prevention, Management, and Rehabilitation; mean gain = 2.40 on max 4; 196.7% proportional improvement) is clinically paramount: awareness of rehabilitation pathways — including the National Mental Health Programme (NMHP), NDDTC services, school nurse referral pathways, and toll-free helplines — is a prerequisite for help-seeking behaviour, a critical outcome in the SUD prevention cascade (NIDA, 2023). Pre-STP, this was the most poorly understood domain, consistent with WHO (2024) and NIDA (2023) findings that treatment-pathway knowledge is universally the weakest domain in adolescent populations worldwide.

The large absolute gain in Section II (Substances, Routes, and Effects; +5.58 points) reflects the high novelty of pharmacological classification content, routes of administration, and mechanism-based

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harm information (e.g., HIV/Hepatitis B and C transmission via shared needles) for this population. Section IV (Recognition of SUD; +3.01 points) gains are clinically significant because peer identification and referral are key components of school-based early-intervention models (Stuart, 2023). The delivery of content at multiple Bloom's taxonomy cognitive levels — combining recall (pharmacological facts), comprehension (mechanism of dependence), and application (recognising SUD signs in a peer scenario) — likely accounts for the breadth and depth of knowledge gains observed across all sections.

5.3 Socio-demographic Correlates of Knowledge Acquisition

The significant gender association ($p = 0.009$), with female participants achieving superior post-test knowledge, parallels findings reported by Singh et al. (2020) and is consistent with the greater health-information-seeking behaviour and reading engagement documented among adolescent females in India (ASER, 2023). This differential has implications for gender-responsive STP design, potentially employing male peer champions as co-facilitators to optimise knowledge transfer across gender subgroups.

The highly significant association between prior information source and post-test knowledge ($p < 0.001$) — with school-based prior education associated with the best post-test performance — is consistent with cognitive assimilation theory (Ausubel, as cited in Bastable, 2019): participants with existing conceptual schemas assimilated new STP content more efficiently. This finding powerfully supports the institutionalisation of sequential, multi-contact drug-education curricula rather than one-off interventions. The paradoxical finding of higher post-test scores among frequently peer-exposed participants ($p = 0.001$) suggests "relevance activation" — the STP content was more personally motivating for this highest-risk subgroup (Bandura, 2001), suggesting differential deployment of intensive STP modules for peer-exposed adolescents may yield maximum public health impact.

5.4 Implications for Nursing Practice and Health Policy

At the practice level, the findings validate school health nurses and community health nurses as efficacious STP delivery agents. The National Health Mission School Health and Wellness Programme under Ayushman Bharat provides existing policy infrastructure for systematically integrating evidence-based drug-education modules into routine school health visits (Ministry of Health & Family Welfare, 2022). At the policy level, the NCERT health curriculum for Classes 9–12 currently includes limited substance-abuse content; the present study's evidence supports a policy

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recommendation for nurse-facilitated, competency-based modules in the formal school curriculum, especially in high-prevalence states. The heavy reliance on mass media as information source (29.7%), given its documented inconsistency and glamorisation of substance use in entertainment content, further underscores the irreplaceable value of structured interactive health education (UNODC, 2023).

5.5 Limitations of the Study

The study acknowledges the following methodological limitations. First, the pre-experimental design lacks a randomised control group, precluding definitive causal attribution; maturation, testing effects, and Hawthorne effects cannot be fully excluded. Second, purposive sampling and geographic restriction to Jaipur district limit external validity. Third, knowledge was the sole outcome; attitudinal change, behavioural intention, and actual substance-use behaviour were not measured, limiting KAP inference. Fourth, the seven-day post-test interval precludes assessment of long-term knowledge retention. Future studies should employ randomised controlled designs with extended follow-up (3 and 6 months), multi-modal outcome assessment (knowledge, attitude, behavioural intention, substance-use incidence), and multi-site sampling across rural Rajasthan to generate Level I evidence for national guideline development.

6. CONCLUSION

This study conclusively demonstrates that a nurse-designed and nurse-delivered Structured Teaching Programme significantly improves adolescent knowledge regarding substance abuse and its complications. The mean score improved from 14.77 ± 4.32 to 34.87 ± 3.94, the paired t-value was 74.28 ($p < 0.001$), and Cohen's d was 4.29 — collectively indicating an exceptionally effective educational intervention. The proportion of participants with adequate knowledge increased from 8.0% to 73.3% following the STP. These findings validate the STP as an evidence-based tool for school-based adolescent substance-abuse prevention in the Indian socioeconomic context. The study reinforces the centrality of the nursing profession in preventive health-education delivery and advocates for the systematic institutionalisation of evidence-based substance-abuse education within India's national school health infrastructure. High-quality randomised controlled trials with multi-modal outcome assessment and extended follow-up are warranted to generate Level I evidence for national guideline development.

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Conflicts of Interest

The author declares no conflict of interest.

Ethical Approval

Institutional Ethics Committee approval was obtained prior to data collection. All procedures adhered to ICMR National Ethical Guidelines (2022) and the Declaration of Helsinki. Informed assent and parental consent were secured for all participants.

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