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Efficacy of School-health Modifier Management Package in Managing Delinquent Behaviours of Adolescents in Secondary Schools in Ikpoba-Okha LGA, Edo State, Nigeria

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Abstract. The paper assessed the efficacy of School-health Modifier Management Package to manage delinquent behaviours of adolescent in secondary schools in Ikpoba-Okha LGA. Four research questions, out of which three were hypothesized and tested at 0.05 level of significance were addressed in the study. A quasi-experimental research design in the form of a pre-test post-test non-equivalent control group design was used for the study. Six thousand and seventy-five (6075) public senior school students in ten schools in the LGA was used. 192 adolescents were randomly selected with multistage sampling procedure and were divided into two groups in accordance with their exposure to the Adolescent Delinquent Questionnaire and one group to the School-Health Modifier Management Package. The package was validated and its reliability was 0.77. In addition, the questionnaire was validated and its reliability established at 0.78. Data obtained were analysed with on-way analysis of covariance. Findings showed that majority (50.0%) of adolescents in secondary schools in Ikpoba-Okha LGA have moderate level of delinquent behaviour while 30.7% and 19.3% were mild and severe respectively. Findings also indicated statistically significant difference in post-intervention management of mild, moderate and severe delinquent behaviours of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention. It was recommended that health educators and stakes at the Ministries of Education and Health should collaborate with the researchers to use the School-Health Modifier Management Package in Oredo, or other Local Government Areas and the entire State to address the social menace of delinquency in secondary schools.

Keywords: School-health, modifier, management, package, adolescent, delinquent behaviour, delinquency.

1. Introduction

Adolescence is a period of transition between childhood and adulthood. The period tends to be marked with developmental, social, and psychological changes. These changes have the potential of making adolescents somewhat incapable to strike a balance between right and wrong decisions and actions in life.

Adolescents seem to occupy a considerable part of societal population. The global population of adolescents who are between 10-24 years is estimated to be 1.8 billion as at 2016 (Sawyer, et al. 2018). Within this age range, delinquent behaviour begins at age 12 increases and reaches its peak at age 19 before it slowly reduces (Ezinga, et al. 2008). During adolescence, some individuals find it difficult to completely undermine childhood tendency and hence become victims of legal action.

Actions exhibited by adolescents which infringe in peoples' social lives and warrant legal action are termed adolescent delinquency. Adolescent delinquency is centred around violence, risky sexual behaviours, risky driving, property destruction, cybercrimes which violate peoples' rights and even social norm. Indulgence in one or more delinquent behaviours can result in substance use or abuse, drop

out of school, incarceration, future criminal actions and injuries. Other examples of the behaviour include theft, selling drugs, burglary, robbery, vandalism and avoiding school (Lopez, et al. 2017). These examples can be put together in levels. For example, Yüksel-Şahin (2013) reported the levels of delinquency in 277 high school Turkish adolescents with 64.26% and 35.74% of them having low and high levels respectively. In another context, Abdullah, et al. (2015) documented three levels of delinquency among high-risk Malaysian youths to be low (91.1%), moderate (7.0%) and high (1.9%).

Irrespective of the form and levels, adolescent delinquency is a legal and public health issue existing in multidimensions in contemporary times. In order to avert the legal actions researchers, governmental and non-governmental agencies have made frantic efforts to help adolescents avoid legal punishments relating to delinquency. Many of the efforts are connected with programmes and therapies on juvenile delinquency including School Drug Control Programme; bullying and gang prevention programme; juvenile awareness programmes, cognitive behavioural therapy, multisystem therapy, intensive supervision, and incarceration-based therapy (Obasuyi, 2023; National Institute of Justice, 2022).

More preventive and intervention efforts have suggested soft skills, morals and value enhancement (Abdullah, et al. 2015); and group-focused Social Skills Training for fostering social skills of adults and/or adolescents with Autism Spectrum Disorder (Hotton & Coles, 2016). In addition, family-focused interventions such as multisystem, and functional family therapies have proved to be effective in reducing adolescent delinquency (Henggelar, 2015). The programme-, therapy-, preventive-, intervention-oriented indications are good but can be insufficient to manage the delinquent behaviours of adolescents in schools. Moreover, the foregoing indications reflect a paucity of information concerning the efficacy of School-health Modifier Management Package (SMMP) in managing adolescent delinquency, not only in schools but all public settings where adolescents are domicile. Hence, the researchers were determined to assess the efficacy of the SMMP in the management of delinquent behaviours of adolescents in secondary schools in Ikpoba-Okha Local Government Area (LGA), Edo State.

1.1 Research Questions

- What are the levels of delinquent behaviours of adolescents in secondary schools in Ikpoba-Okha LGA?
- Is there a difference in post-intervention management of severe delinquent behaviour of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention?
- Is there a difference in post-intervention management of moderate delinquent behaviour of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention?
- Is there a difference in post-intervention management of mild delinquent behaviour of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention?

1.2 Hypotheses

The following hypotheses were postulated and tested at 0.05 level of significance:

- There is no statistically significant difference in post-intervention management of severe delinquent behaviour of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention.
- There is no statistically significant difference in post-intervention management of moderate delinquent behaviour of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention.
- There is no statistically significant difference in post-intervention management of mild delinquent behaviour of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention.

2. Methods and materials

Quasi-experimental research design involving the pre-test post-test non-equivalent control group type was used. In it, participants remained in their intact classes in order to maintain the running of the normal school programme. The researchers did not randomly select the schools or the participants in the schools. The SMMP was the independent variable and this was used for the treatment and the dependent variable was adolescent delinquent behaviours. Thus, one treatment group with a non-attention control group were involved. The schools were assigned into treatment and control groups.

The population of the study consisted of the six thousand and seventy-five (6075) public senior secondary school students in ten schools in Ikpoba-Okha LGA in Edo State (Post-primary Education Board Statistics, 2021). A sample size of 192 adolescents was used in the study. A multistage sampling technique was used. The first stage involved the use of systematic sampling technique to select five schools. This involved arranging the schools in alphabetical order. Consequently, the first and every third school were picked to obtain the five schools. The schools were then tagged as Group A, B, C, D and E.

The second stage involved the use of simple random sampling technique of balloting with replacement to select three groups. The five groups were written out in separate piece of paper, folded and put in a tin. After thorough shuffle, a piece was picked at a time, recorded and replaced in the tin. After another shuffle of the tin, the process was repeated until the three groups were selected. Where a piece of paper already picked was taken, it was replaced into the tin. The groups selected were B, C and E.

Still with simple random sampling of balloting with replacement, the three groups B, C and E were involved in choosing the experimental and control groups. This was achieved using the procedure already described in stage two. After the first shuffle, the first group picked, recorded and replaced into the tin was taken as the experimental group and the other was control group. Thus, Group B and E were taken as experimental and control groups respectively. The 192 students were used for the study in their intact class which were the Senior Secondary School (SSS) 2 students. The researchers purposively selected the SSS 2 students because they were presumed to have been fully settled for senior secondary school learning. The SSS 1 and 3 were excluded because they were also presumed to be at the border line with SSS 1 waiting to select the subjects for external examination and SSS 3 awaiting their external examination. The experimental group B consisted of 91 while the control group consisted of 101 students. Informed consent forms, one for participant and the other for parent/guardian, were given out to the sampled students. Only those who volunteered by signing the form and whose parent/guardian also voluntarily signed the forms were enlisted and that made the sample size.

A 25-item 'Adolescent Delinquency Questionnaire ADQ', adapted from a 45-item Adolescent Delinquency Scale (ADS) developed by scholars at the University of Minnesota in the early 1990s was used to collected data. In the 45-item scale, a number of items were modified and others adapted to reflect the final ADQ. It is made up of two sections with Section A being the bio-data of the participants [age bracket and Senior Secondary School (SSS) 2 Class Levels A, B, C and D] while Section B consists of items that depict a four-point scale covering items on the delinquent behaviours as perceived by the adolescents. The scale is structured as strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD) with score of 4, 3, 2 and 1 assigned respectively. Mean score ranges of 1.00 to 29.99, 30.00 to 69.99 and 70.00 to 100 were used to qualify adolescents who perceived that they have exhibited severe delinquent behaviour (SDB), moderate delinquent behaviour (MoDB) and mild delinquent behaviour (MDB) respectively in the past four weeks. The ADQ was validated by three experts in health education and counselling psychology of the University of Benin. Corrections were made and the reliability was established using test re-test method and a coefficient of .78 was obtained.

The SMMP is a blueprint involving what trainers or trainees can do in order to teach or learn a life skill for behaviour modification (Obasuyi & Obasuyi, 2025). The SMMP is a table made up of themes/modifiers with appropriate behavioural objectives which participants are expected to be exposed to for specific period. The validity of the SMMP with its modifier was done by experts in Health and Counselling Psychology and the Cohen's kappa (r) was used to establish the reliability yielding a coefficient of 0.77 (Obasuyi & Obasuyi, 2025).

The ADQ and the SMMP were administered to the participants with the help of five research assistants in three stages. Stage One (Week 1): Two of the assistants were the class teachers of the participants and they were in charge of administering the ADQ for pre-test score to the control group. The researchers briefed them on the objectives of the study. The ADQ was also administered to the experimental group with the aid of the other three research assistants and were retrieved immediately after filling. This was also to obtain the pre-test scores which depicted the level of severity of delinquency of participants. Stage Two (Weeks 2 to 9): The researchers and the other three researcher assistants were in charge of administering the SMMP to the experimental group for the next eight weeks with one session each week. Each session lasted for 40 minutes. Participants were reached every Friday immediately after school hours. Stage three: After treatment, the ADQ was readministered to the experimental and control groups during the tenth week by the researchers and research assistants. This was to obtain the post-test score from the experimental and

control groups. Only those that covered the nine sessions were post-tested. Room was given for generalization and follow up of the participants after the programme during the eleventh week.

Extraneous variables capable of influencing the results of the study were experimental bias, attrition, hawthorne effect, respondents' error, subject bias and leakages of instrument, interaction effect and management package. To control experimental bias, the researchers strictly followed the package of management. The researchers with the aid of the assistants, controlled respondents' errors by ensuring that the respondents were given enough time to respond to the instrument. The researchers also assured the instrument did not have technical jargons. For subject bias, respondents within the age bracket of 10-24 years and who were not aware of their group or the objective of the study were involved. They were also given sufficient time to respond to the instrument. For interaction effect, the respondents were in different schools sited far apart. The instrument and management package were enveloped and sealed as sensitive materials. For attrition, the researchers agreed with the school authority and participants with their parent/guardian that Friday after school hour was the most convenient day and time of the week for the intervention. In addition, participants that enlisted for the programme for the first session were registered for the second session and monitored with their or their parents/guardian telephone numbers through the other sessions.

Data obtained were analysed with descriptive statistics and one-way analysis of covariance at .05 alpha level.

3. Results

Table 1: Mean scores, standard deviation and percentages of the Levels of delinquent behaviours of adolescents in secondary schools in Ikpoba-Okha LGA

	MDB			**MoDB**			**SDB**		
	N (%)	Mean	Std Dev	N (%)	Mean	Std Dev	N (%)	Mean	Std Dev
Control	31	15.19	3.692	50	48.72	9.109	20	82.95	6.278
Experimental	28	18.25	4.160	46	48.41	7.990	17	84.06	6.533
Total	59 (30.7)	16.64	4.180	96 (50.0)	48.57	8.548	37 (19.3)	83.46	6.332

Data in Table 1 shows the mean scores of the levels of delinquent behaviours of adolescents in secondary schools in Ikpoba-Okha LGA. The mean and standard deviation of participants who perceived they exhibited MDB in the past four weeks in the control and experimental groups are 15.19±3.692 and 18.25±4.160 respectively. Additionally, the mean and standard deviation of participants who perceived they exhibited MoDB in the past four weeks in the control and experimental (groups are 48.72±9.109 and 48.41±7.990 respectively. Also, the mean and standard deviation of participants who perceived they exhibited SDB in the past four weeks in the control and experimental groups are 82.95±6.278 and 84.06±6.533 respectively. An overall mean ad standard deviation of the participants in both the control and experimental groups are 16.64±4.180, 48.57±8.548 and 83.46±6.332 for the MDB. MoDB and SDB respectively. Therefore, majority (50.0%) of adolescents in secondary schools in Ikpoba-Okha LGA have moderate level of delinquent behaviour while 30.7% and 19.3% were mild and severe respectively.

Table 2: Estimated marginal means of SDB of adolescents at experimental and control groups

				95% Confidence Interval	
Group	N (SDB)	Mean	Standard Error	Lower Bound	Upper Bound
Experimental	17	83.821	.219	83.376	84.266
Control	20	83.152	.202	82.742	83.562

Data in Table 2 depicts the estimated marginal means of SDB which are adjustment means after controlling for pre-intervention for the experimental and control groups. The data is an indication that the effect of pre-intervention has been removed. Comparing the estimated marginal means showed a higher efficacy of SMMP post intervention (mean = 83.82) compared to the control group (mean = 83.15). Therefore, participants with SDB who were exposed to SMMP had a higher mean score.

Table 3: One-way ANCOVA results of pre- and post-test mean scores in the management of SDB of adolescents exposed to SMMP and those in the control group.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1415.520[a]	2	707.760	869.691	.000
Intercept	.900	1	.900	1.106	.300
Pretest	1404.222	1	1404.222	1725.499	.000
SDB	4.107	1	4.107	5.047	.031
Error	27.669	34	.814		
Total	259166.000	37			
Corrected Total	1443.189	36			

Data in Table 3 is the One-way ANCOVA results of pre- and post-test mean scores in the management of SDB of adolescents exposed to SMMP and those in the control group. There is a statistically significant difference in the post intervention management with SMMP [F (1, 34) = 5.047, p = .031] while adjusting for pre-intervention. The hypothesis which states that there is no statistically significant difference in post-intervention management of SDB of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention is rejected. Therefore, there is a statistically significant difference in post-intervention management of SDB of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention. Since a statistically significant result was obtained, a post-hoc test was required in order to ascertain where the difference lied, and hence Table 4.

Table 4: Post-hoc test of pairwise comparisons of pre- and post-test mean scores in the management of SDB of adolescents exposed to SMMP and those in the control group.

SDB	(J) SDB	Mean difference (I-J)	Standard Error	Sig.
Control	Experimental	-.669[*]	.298	.031
Experimental	Control	.669[*]	.298	.031

Data in Table 4 is the post-hoc test of pairwise comparisons of pre- and post-test mean scores in the management of SDB of adolescents exposed to SMMP and those in the control group. From the data, statistically significant differences were found between the control and experimental groups and vice versa (p = 0.031).

Putting result together for hypothesis one: there is a statistically significant difference in post-intervention management of SDB of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention. This means that SMMP was efficacious in the management of SDB of the adolescents it was exposed to.

Table 5: Estimated marginal means of MoDB of adolescents at experimental and control groups

				95% Confidence Interval	
Group	N (MoDB)	Mean	Standard Error	Lower Bound	Upper Bound
Experimental	46	48.851	.189	48.476	49.226
Control	50	48.317	.181	47.958	48.677

Data in Table 5 shows the estimated marginal means of MoDB which are adjustment means after controlling for pre-intervention for the experimental and control groups. The data is an indication that the effect of pre-intervention has been removed. Comparing the estimated marginal means showed a higher efficacy of SMMP post intervention (mean = 48.851) compared to the control group (mean = 48.317). Therefore, participants with MoDB who are exposed to School-health Modifier has a higher mean score.

Table 6: One-way ANCOVA results of pre- and post-test mean scores in the management of MoDB of adolescents exposed to SMMP and those in the control group.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	6789.175[a]	2	3394.588	2072.666	.000
Intercept	176.874	1	176.874	107.996	.000
Pretest	6786.918	1	6766.918	414.954	.000
MoDB	6.805	1	6.805	4.155	.044
Error	152.314	93	1.638		
Total	233437.000	96			
Corrected Total	6941.490	95			

Data in Table 6 is the One-way ANCOVA results of pre- and post-test mean scores in the management of MoDB of adolescents exposed to SMMP and those in the control group. There is a statistically significant difference in the post intervention management with SMMP [F (1, 93) = 4.155, p = .044] while adjusting for pre-intervention. The hypothesis which states that there is no statistically significant difference in post-intervention management of MoDB of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention is rejected. Therefore, there is a statistically significant difference in post-intervention management of MoDB of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention. Since a statistically significant result was obtained, a post-hoc test was required in order to determine where the difference lied, and hence Table 7.

Table 7: Post-hoc test of pairwise comparisons of pre- and post-test mean scores in the management of MoDB of adolescents exposed to SMMP and those in the control group.

MoDB	(J) MoDB	Mean difference (I-J)	Standard Error	Sig.
Control	Experimental	-.534*	.262	.044
Experimental	Control	.534*	.262	.044

Data in Table 7 is the post-hoc test of pairwise comparisons of pre- and post-test mean scores in the management of MoDB of adolescents exposed to SMMP and those in the control group. From the data, statistically significant differences were found between the control and experimental groups and vice versa (p = 0.044).

Putting result for hypothesis two together: there is a statistically significant difference in post-intervention management of MoDB of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention. This means that SMMP was efficacious in the management of MoDB of the adolescents it was exposed to.

Table 8: Estimated marginal means of MDB of adolescents at experimental and control groups

				95% Confidence Interval	
Grou	N (MDB)	Mean	Standard Error	Lower Bound	Upper Bound
Experimental	28	17.468	.323	16.822	18.115
Control	31	15.899	.306	15.286	16.513

Data in Table 8 shows the estimated marginal means of MDB which are adjustment means after controlling for pre-intervention for the experimental and control groups. The data is an indication that the effect of pre-intervention has been removed. Comparing the estimated marginal means showed a higher efficacy of SMMP post intervention (mean = 17.468) compared to the control group (mean = 15.899). Therefore, participants with MDB who are exposed to SMMP have a higher mean score.

Table 9: One-way ANCOVA results of pre- and post-test mean scores in the management of MDB of adolescents exposed to SMMP and those in the control group.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	853.938[a]	2	426.969	149.826	.000
Intercept	91.430	1	91.430	32.083	.000
Pretest	716.502	1	716.502	251.425	.000
MDB	34.640	1	34.640	12.155	.001
Error	159.587	56	2.850		
Total	17358.000	59			
Corrected Total	1013.525	58			

Data in Table 9 reflect the One-way ANCOVA results of pre- and post-test mean scores in the management of MDB of adolescents exposed to SMMP and those in the control group. There is a statistically significant difference in the post intervention treatment of SMMP [F (1, 56) = 12.155, p = .001] while adjusting for pre-intervention. The hypothesis which states that there is no statistically significant difference in post-intervention management of MDB of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention is rejected. Therefore, there is a statistically significant difference in post-intervention management of mild MDB of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention. Since a statistically significant result was obtained, a post-hoc test was required in order to ascertain where the difference existed, and hence Table 10.

Table 10: Post-hoc test of pairwise comparisons of pre- and post-test mean scores in the management of MDB of adolescents exposed to SMMP and those in the control group.

MDB	(J) MDB	Mean difference (I-J)	Standard Error	Sig.
Control	experimental	-1.569*	.450	.001
Experimental	control	1.569*	.450	.001

Data in Table 7 is the post-hoc test of pairwise comparisons of pre- and post-test mean scores in the management of MDB of adolescents exposed to SMMP and those in the control group. From the data, statistically significant differences were found between the control and experimental groups and vice versa ($p = 0.001$).

Putting result for hypothesis three together: there is a statistically significant difference in post-intervention management of MDB of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention. This means that SMMP was efficacious in the management of MDB of the adolescents it was exposed to.

4. Discussion of findings

Findings showed that majority (50.0%) of adolescents in secondary schools in Ikpoba-Okha LGA have moderate level of delinquent behaviour while 30.7% and 19.3% were mild and severe respectively. The three levels of delinquent behaviour of adolescents are consistent with Abdullah, et al. (2015)'s three levels, but with low being (91.1%), moderate (7.0%) and high (1.9%). This present study indicating that majority of the participants have moderate level of delinquency, is consistent with Abdullah, et al. (2015)'s study. In addition, the levels of the present study are somewhat close to the two levels of delinquency documented by Yüksel-Şahin (2013)'s study. In Yüksel-Şahin (2013)'s study, the predictive influence of multiple factors on delinquency levels in 277 high school Turkish adolescents was reported to be 64.26% and 35.74% for low and high levels respectively.

Results also indicted that there is a statistically significant difference in post-intervention management of SDB of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention. This indicated that SMMP was efficacious in the management of SDB of the adolescents it was exposed to. Finding is consistent with the results of Obasuyi and Obasuyi (2025) that a health intervention and self-help tool kit in the form of School-Health Modifier not only help manage behavioural excesses but can assist students learn basic life skills needed to successfully manage undesirable health behaviour. This implies that both SMMP and School-Health Modifier are efficacious tools to manage adolescent delinquency. Adolescent delinquency being a social misconduct means that the finding is similar to Alizadehfard (2018)'s social skills training effectiveness among children with Nonverbal Learning Disorder.

Findings also revealed that there is a statistically significant difference in post-intervention management of MoDB of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention. Thus, SMMP was efficacious in the management of MoDB of the adolescents that received the exposure. MoDB is a social dilemma and hence the finding is in congruence with authority such as van der Stowe et al. (2020) that has provided the effectiveness of social skills training for adolescents' social misbehaviours.

Finally, results depicted that there is a statistically significant difference in post-intervention management of MDB of adolescents with SMMP, between the experimental and control groups when adjusted for pre-intervention. Hence, SMMP was efficacious in the management of MDB of the adolescents it was exposed to. Finding could be likened to the fact that adolescents with social misconduct of the nature of mild delinquency can be assisted with the SMMP. As a social misconduct, finding is partly consistent with the study of Ned M Bal and Sungur (2015) that post-test scores of the social skills training were effective in handling adolescents' social issues.

5. Conclusion

The levels of delinquent behaviours of adolescents in secondary schools in Ikpoba-Okha are mild, severe and moderate representing 30.7%, 19.3% and 50.0% respectively. The SMMP is efficacious in the management of severe, moderate and mild levels of delinquent behaviours of adolescents in secondary schools in Ikpoba-Okha Local Government Area.

6. Recommendations

Based on the findings, the following recommendations were made:

1. Health Educators should adopt the SMMP as a baseline interventional technique to help adolescents

at the severe and mild levels of delinquency through the organisation and administration of several management sessions in order to further reduce the number of adolescents with perceived severe and mild levels of delinquency.

2. In addition, Health Educators should also adopt the SMMP as a baseline interventional technique to help adolescents at the moderate level of delinquency through the organisation and administration of several management sessions in order to drastically reduce the number of adolescents with perceived moderate level of delinquency.

3.Non-governmental Organisations (NGOs) and other stakeholders should collaborate with the researchers of this paper in order to figure out adolescents at the mild, moderate and severe levels of delinquency in other schools in Oredo or any other Local Government Area in Edo State and use the SMMP as an interventional effort to address delinquency in the schools.

4. A larger scale study should be conducted with this paper, with the efforts of the researchers, health education stakeholders, counselling psychologists, NGOs and Government Agencies at the Ministries of Education and Health, at the State level in order to address the social menace of mild, moderate and severe delinquency especially of adolescents.

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