ISSN: 2976- 1077 (Online)

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Multi-disciplinary double-blind peer review journal

http://doi.org/10.58196/jhswn/v15.1.172

Prevalence and Determinants of Depression among Secondary Level Students in Kathmandu, Nepal

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Publishing Process.
Received on: July 15, 2025
Finalized to publish: August 30, 2025

Open Access 4.0
Published date: September 17, 2025

Abstract

Background: Depression has been a common public health concern among school-going adolescents and youths. However, the status of depression is less studied among school students in Nepal. This study aims to address the research gap by assessing the prevalence and contributing factors among secondary-level students at public schools in Kathmandu, Nepal.

Methods: An analytical cross-sectional study was conducted among 296 secondary-level students of four government schools of Tokha Municipality, Kathmandu. The depression level was assessed using the Nepali version of the Center for Epidemiologic Studies Depression scale, which was further supplemented by participants' demographic and socio-economic characteristics. Data were collected face-to-face using a self-administered questionnaire. Simple and multiple linear regression were carried out to identify factors associated with depression. A p-value and 95% confidence interval were used for statistical significance.

Findings: Out of 292 participants, the majority of respondents were female (57.2%) and belonged to the age group equal to or above 18 years. The prevalence of depression was found to be 25.3% where mild depression was relatively higher, accounting for almost half among the depressive respondents (11%). Multiple linear regression analysis revealed that religion (β=3.39, 95% CI: 1.71; 5.06), worrying about the future (β=0.12, 95% CI: -2.24; 2.49), and being harassed in school/ college (β=3.8, 95% CI: 1.24; 6.35) were found to be associated with higher depression scores. Furthermore, living with family (β=-1.57, 95% CI: -3.08; -0.06) and problems sharing with friends (β=-2.26, 95% CI: -4.22; -0.29) were found to be associated with a lower depression score.

Conclusion: The study showed a substantial burden of depression among school-going adolescents. These findings highlight the need for further research on school-based programs that address mental health challenges.

Keywords: Depression, Kathmandu, Secondary, Students.
Declaration: There is no conflict of interest.

Introduction

Adolescence is a transitional stage of significant changes where an individual experiences physical, psychological, social, and cognitive development and changes that are confined to a period from puberty to legal adulthood (1). Globally, it is estimated that approximately one-third of all health problems during adolescence and young adulthood (ages 15-19) can be attributed to mental health issues (2). Depression,

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which is characterized by low energy and mood, loss of pleasure, sleep and appetite problems, and thoughts of death, is a common mental disorder ranking third after cardiac and respiratory diseases (3,4). It is a widely recognized and significant mental health issue that profoundly affects a substantial number of high school students (5–7). The Global Burden of Disease Study has noted that unipolar major depression is one of the leading causes of disability-adjusted life years in 2020 (8). An estimated over 264 million people worldwide suffer from depression, 13% of people aged 10 to 19 suffer from a mental illness, making up one in seven of this age group's total disease burden (9). Between 1990 and 2019, the global number of Disability Adjusted Life Years (DALYs) due to mental disorders increased from 80.8 million to 125.3 million, and the proportion of global DALYs attributed to mental disorders increased from 3.1% to 4.9% (10). A meta-analysis of 26 studies on the mental health of teenagers found that overall, 5.6% of adolescents between the ages of 13 and 18 had significant depressive disorders (11).

In the context of Nepal, only a few studies have focused on adolescents' psychosocial problems, although the adolescent population accounts for almost a quarter of the population of Nepal. A nationwide study, the National Mental Health Survey 2020, shows that about 5.2 percent of teenagers aged 13-17 suffered from mental health problems, with 4.6% of respondents expressing feelings of anxiety (12). Prevalence of depression among adolescent students as reported from existing literature, varies from 6.4% to 52.9%. The National Mental Health Policy was developed in Nepal in 1996 to integrate mental health into primary health care services (13). The Ministry of Health and Population has adapted the World Health Organization's (WHO) Mental Health Gap Action Programme (mhGAP) and revised the National Adolescent Health and Development Strategy (13). The Government of Nepal launched the "One School One Nurse" initiative, which was first implemented by the Provincial Government of Bagmati Province in 2018/2019 to improve child and adolescent health in selected regions of the country. The initiative has been rolled out in 1,011 schools throughout Nepal by the fiscal year 2022/2023 (14,15). In Lalitpur, the school nurse service utilization rate among secondary students was 28.69% (16).

High school education represents a significant turning point in the lives of academic students. However, mental health services receive insignificant attention at all levels of society, from the government to the public in Nepal. Only a limited researchers have conducted research in this area, so this was expected that the new researchers would benefit from this research. Therefore, this study aims to provide empirical evidence on the prevalence and determinants of depression among secondary-level students in Tokha Municipality, Nepal.

Materials and Methods

Study design, setting and population

A cross-sectional study was conducted across four secondary public schools located within the Tokha Municipality, Kathmandu. The study population comprises students enrolled in Grades 11 and 12 in the selected schools.

Sample size calculation and sampling techniques

The required sample size was calculated by using Cochran's equation, i.e., $n= z^2 p(1-p)/e^2$ where the proportion (p)= 0.565 (7), with a 95% confidence level and 5% margin of error. Given that, the student population was known (n=932) (17). The finite population correction was applied using the formula: n/1+(n-1)/N. This yielded a minimum sample size of 269. Accounting for a 10% non-response rate, the final sample size was adjusted to 296.

All four public secondary schools within Tokha Municipality (N = 932) were purposively selected to form the sampling frame. Students from each school were then selected using probability proportional to size (PPS) sampling to ensure equitable representation and minimize selection bias. Final participants were drawn using a simple random sampling approach.

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Exclusion criteria

Students with comorbidities such as obstructive sleep apnea, chronic respiratory illnesses (e.g., COPD), stable disease requiring clinical care, or a history of smoking (current or former) were excluded. Those unable or unwilling to participate were also excluded.

Data collection tools

Data was collected using a semi-structured, self-administered questionnaire developed in the Nepali language to ensure clarity and comprehensibility. The questionnaire had sections on socio-demographic information, personal information, and behavioral characteristics, and a Center for Epidemiologic Studies Depression Scale (CES-D) to assess depressive symptoms. The CES-D is a validated 20-item tool using a 4-point ordinal (0= "rarely or none of the time" to 3 = "most or all the time") with four items reverse-coded. The total score ranges from 0 to 60; a higher score indicates greater depressive symptoms (18).

Data collection techniques

Data were collected following permission from participating schools. The finalized questionnaire, available in both English and Nepali, was pretested on a sample of 30 students from a school near the sampled municipality to ensure face validity. Before data collection, orientation sessions were held to familiarize participants with the questionnaire. Written informed consent was obtained from all students, and additional parental consent was secured for participants under 18 years of age. Self-administered questionnaires were then distributed in classrooms under conditions designed to reduce response bias and maintain confidentiality.

Data processing and analysis

The completed questionnaires were reviewed daily for accuracy and completeness. For discrete or continuous variables, the mean, median, standard deviation, and interquartile ranges were calculated when appropriate, while categorical variables were analyzed in terms of frequency and percentages. The total scores of both scales were calculated by summing the scores of each item and treated as a continuous outcome variable for statistical analysis.

Simple and multivariable linear regression were performed as inferential tests. The assumptions for linear regression were evaluated based on the residuals. Multi-collinearity between independent variables was examined using the Pearson correlation coefficient and the variance inflation factor (VIF). Additionally, the regression ANOVA was performed to assess the linearity of the model. All variables with a p-value of ≤ 0.25 in simple linear regression were considered for inclusion in the multiple linear regression model. Unstandardized estimates (β), standard error (SE), and 95% confidence interval (CI) of estimates were reported for each variable in the multiple linear regression to assess the level of association and statistical significance. The accepted level of significance was set at below 0.05 ($p<0.05$). All statistical calculations were performed using SPSS.

Ethical approval and consent

Permission for the study was obtained from the Department of Public Health, Kantipur Academy of Health Sciences (Ref. No.: 307/080). Institutional permissions were secured from the individual schools involved in the study. Written informed consent was obtained from all participating students, and parental consent was mandatory for minors. Participant confidentiality and privacy were strictly upheld throughout the research process.

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Results

Socio-demographic, personal behavioral and abuse-related information of respondents

Among 292 students, the majority of respondents were female, accounting for 57.2% and the age group equal or above 18 years. According to the family type distribution, 42.8% were from a nuclear family and the rest were from a joint/extended family. Likewise, 26.4% students felt pressure from study, whereas 89% were worried about the future. A total of 65 respondents had a breakup in the past six months and 35.96% of the participants shared their problem with friends, whereas almost half of the students shared with family. Similarly, 5.8% of respondents were harassed or abused by their own family member and 9.6% were harassed in school/ college.

Table 1: Socio-demographic information of respondents (n=292)

Variables	**Frequency (%)**
Age group	
Less than 18 years	117 (40.1)
18 and more than 18 years	175 (59.9)
Gender	
Male	125 (42.8)
Female	167 (57.2)
Marital Status	
Unmarried	284 (97.3)
Married	8 (2.8)
Religion	
Hindu	226 (77.4)
Buddhist	46 (15.5)
Others	20 (7.1)
Types of Family	
Nuclear Family	125 (42.8)
Extended/Joint Family	167 (57.2)
Educational Status of the Head of Family	
Illiterate	59 (20.2)
Can read and write	74 (25.3)
Primary Level	59 (20.2)
Secondary Level and above	100 (34.3)
Place of Accommodation	
Rented	132 (45.2)
Family	118 (40.4)
Relatives	42 (14.4)

Table 2: Personal behavior-related information of respondents (n=292)

Variables	Frequency (%)
Smoke	11 (93.8)
Alcohol consumption	56 (19.2)
Exercise	44 (15.1)
Death of a Family Member in the past 1 year	59 (20.2)
Pressure from the study	77 (26.4)

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Breakup in the past 6 months	65 (22.3)
Worried about the future	260 (89)
Parent fight	133 (54.4)
History of mental health problems	34 (11.6)
Felt stressed	203 (69.5)

Table 3 Abuse-related information of respondents (n=292)

Variables	**Frequency (%)**
Problem shared to	
Friends	105 (35.9)
Family	132 (45.2)
Others	55 (18.8)
Harassed in school/college	28 (9.6)
Harassed or abused by family members	17 (5.8)

Prevalence of depression according to severity

Prevalence of depression was found to be a quarter (25.34%), whereas the remaining did not have depression. According to severity, the study found that about three-quarters of the respondents with no depression, whereas mild depression was relatively higher, accounting for almost half among the depressive respondents, while one quarter had moderate depression.

Factors associated with depression using simple and multiple linear regression

Table 5 exhibits the unadjusted and adjusted analysis of factors associated with depression among students of the secondary public school of Tokha municipality. The simple regression analysis revealed that religion (β= 4.18, 95% CI: 2.44; -5.92), place of accommodation with family (β=-2.11, 95% CI: -3.75; -0.50), parent fights (β= 2.56, 95% CI: 1.08; 4.05), history of mental health problems (β=2.85, 95% CI: 0.52; 5.19), stress felt (β= 2.53, 95% CI: 0.91; 4.14), worried about future (β= 2.56, 95% CI: 0.16; 4.96), problem shared to friends (β= -2.99, 95% CI: -5.11; -0.88) and harassed in school/ college (β= 5.16, 95% CI: 2.66; 7.65) were associated with depression among students.

On the other hand, the multivariable (adjusted) regression analysis revealed similar findings, except parent fights, history of mental health problems and stress felt, which were found not to be statistically significant with the depression score. Variables associated with increased depression score were religion (3.39 point increase), worried about the future (0.12-point increase), and harassed in school/ college (3.8 point increase). In contrast, the place of accommodation with family (β=-1.57, 95% CI: -3.08; -0.06) and problems shared with friends (β=-2.26, 95% CI: -4.22; -0.29) were found to be associated with a lower depression score.

Table 4 Factors associated with depression using simple and multiple linear regression (n=292)

Characteristics	**Unadjusted**		**Adjusted[#]**	
	β (SE)	**CI**	**β (SE)**	**CI**
Age	-0.01(0.19)	-0.05; 0.02	-0.13(0.28)	-0.70; 0.43
Gender (Ref: Male)				
Female	0.08(0.05)	-0.01; 0.18	0.62(0.75)	-0.85; 2.10
Marital status of parents (Ref: Unmarried)				
Married	1.80(2.34)	-2.82; 6.42	1.09(1.20)	-1.27; 3.44

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Characteristics	Unadjusted		Adjusted[#]	
	β (SE)	CI	β (SE)	CI
Religion (Ref: Hindu)				
Non-Hindu	4.18(0.88)	2.44; 5.92*	3.39(0.85)	1.71; 5.06**
Types of family (Ref: Nuclear)				
Extended/ Joint	0.22(0.77)	-1.30; 1.75		
Educational Status of the Head of Family (Ref: Illiterate)				
Can read and write	0.77(1.15)	-1.49; 3.02		
Primary	0.34(1.21)	-2.04; 2.72		
Secondary and above	-0.33(1.08)	-2.45; 1.79		
Place of accommodation (Ref: Rented)				
Family	-2.11(0.82)	-3.75; -0.50*	-1.57(0.77)	-3.08; -0.06*
Relatives	-0.14(1.14)	-2.40; 2.11	0.46(1.10)	-1.70; 2.62
Smoke (Ref: No)				
Yes	0.49(2.01)	-3.48; 4.45		
Alcohol (Ref: No)				
Yes	-0.93(0.97)	-2.84; 0.99		
Exercise (Ref: No)				
Yes	0.31(1.07)	-1.80; 2.42		
Death of Family Member (Ref: No)				
Yes	1.34(0.95)	-0.53; 3.21	0.05(0.91)	-1.73; 1.83
Pressure from the study (Ref: No)				
Yes	0.62(0.87)	-1.09; 2.33		
Breakup in past 6 months (Ref: No)				
Yes	0.29(0.92)	-1.53; 2.1		
Parents Fight (Ref: No)				
Yes	2.56(0.75)	1.08; 4.05*	1.45(0.74)	-0.01; 2.91
History of mental health problems (Ref: No)				
Yes	2.85(1.18)	0.52; 5.19*	1.89(1.13)	-0.33; 4.11
Stress Felt (Ref: No)				
Yes	2.53(0.82)	0.91; 4.14*	1.12(0.83)	-0.53; 2.74
Worried about the future (Ref: No)				
Yes	2.56(1.22)	0.16; 4.96*	0.12(1.20)	-2.24; 2.49**
Problem shared to (Ref: Others)				
Friends	-2.99(1.08)	-5.11; -0.88*	-2.26(1.00)	-4.22; -0.29*
Family	-2.11(1.04)	-4.12; -0.06	-1.41(0.98)	-3.34; 0.52
Harassed or abused by a family member (Ref: No)				
Yes	2.84(1.63)	-0.37; 6.04	-0.35(1.64)	-3.34; 0.52
Harassed in school/ college (Ref: No)				
Yes	5.16(1.27)	2.66; 7.65**	3.8(1.3)	1.24; 6.35**

*p-value<0.05, **p-value <0.001

Discussion

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ISSN: 2976- 1077 (Online)

Multi-disciplinary double-blind peer review journal

http://doi.org/10.58196/jhswn/v15.1.172

This study was conducted to determine the prevalence and assess contributing factors among secondary-level students of public schools in Kathmandu, Nepal. The study showed the overall prevalence of depression among secondary level students in Tokha Municipality was 25.3% with mild and major depression at 11% and 14.3% respectively. The study showed that religion, place of accommodation with family, worrying about the future, problems shared with friends and harassment in school/ college were found to be associated with depression among students of the secondary public school of Tokha municipality. Prevalence of depression among adolescent students as reported from existing literature varies from 6.4% to 52.9% (19–23) where we found it was 25.3% in our study, which was similar to the community-based study, which states the prevalence of depression was found to be 27% (24). This aligns with the literature, where studies conducted in Pokhara Metropolitan and the urban municipality of Kathmandu showed that the overall prevalence of depression among high school students was 44.2% and 56.5% respectively, which is almost double that of our study (2). Our report showed a significant association with stress felt, which was highlighted in the study in the urban municipality of Kathmandu (7). Furthermore, a community-based study from Gokarneshwor Municipality of Kathmandu District noted that those suffering from depression were found to be nearly half of our findings when measured through the Patient Health Questionnaire (25).

Our study showed the mild depression of 11%, moderate depression of 6.9% and 7.4% severe depression, whereas the study conducted in Bhopal, Madhya Pradesh, showed 60 (44.1%) of study participants to have scores corresponding to a mild degree of depression and 33 (24.3%) from moderate depression and 3% from severe depression (26). The prevalence rates of moderate to severe levels of depression in our study were similar to the study done in Bangladesh, which showed depression at 26.5% and anxiety 18.1% (27). The research conducted in Nigeria showed the that majority misidentified depression as physical illness (26.1%), maltreatment/physical or sexual abuse (15.0%), 'thinking too much' (13.6%), emotional problem (14.3%), or stress (11.8%), which was similar to our study (28). The results of a systematic review of 340 studies on the relationship between depressive symptoms in children and adolescents with chronic physical illness are consistent with the finding that adolescents who reported having a chronic physical illness were more likely to experience significant depressive symptoms than those who did not report having such an illness (29).

In this study, no statistical association was observed between depression and socio-demographic characteristics of students, such as age and gender. A similar finding was observed among undergraduate students of Pokhara Metropolitan (30). It was also noted that parents' marital status and parental education level have no relation to students' depression. Similar findings were shared by the study performed among secondary students in Iran and China (31,32). The prevalence of depression among students of public schools in our study showed a significant association with religion, and place of accommodation, which was, aligns with the study done in school-going adolescents in an Urban Area of Bihar, India (33). Tobacco use and alcohol use were not found to be statistically significant with depression among secondary school students. Nevertheless, a study conducted among adolescents in Brazil showed a significant association with depression (OR = 2:23, CI: 1.12-4.43) and (OR = 2:626, 1.079-0.639) respectively (34). Harassment was found to be a significant association with depression, which was similar to the study conducted among Teenage School Girls in Lalitpur and Rupandehi districts (35). Exercises were not found to be statistically significant with depression among school-going students but the study conducted in Korea revealed that those students with no physical activity were found to be a risk factor for depression (36). The fight between parents does not have significant correlations with depression; however, it was found to be the opposite of our study done among adolescent students in a public school (37).

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The country's education system often emphasizes high-stakes exams and performance over emotional well-being, creating intense pressure. Limited access to mental health resources in schools further worsens the issue. Additionally, the overall socio-economic situation of the country, including poverty, unemployment, and family financial stress, can deeply affect students' mental health. Those from lower-income backgrounds may face additional burdens, such as a lack of educational support or the need to work alongside studying. Conversely, students from more stable economic settings may still experience pressure due to high parental expectations. Together, these factors create an environment where depression can thrive, particularly when emotional support is lacking.

The findings indicated a considerable level of depressive symptoms among secondary-level students in Tokha Municipality, which aligns with the existing literature of our country, predicting be high rate of depression. This could be partly explained by the timing of data collection, which took place at the end of the academic session- a particularly stressful period for students. For those in grade eleven, this time marks a major transition as they move from secondary school into higher secondary education. Many students may struggle to adapt to the increased academic demands and changes in environment, leading to feelings of anxiety, uncertainty, and emotional distress. Meanwhile, grade twelve students face the immense pressure of preparing for their final board examinations, which are often viewed as critical for their future academic and career paths. The combined stress of academic expectations, fear of failure, and limited coping mechanisms may have contributed to the elevated levels of depression found among students during this period.

This study revealed that religion and place of accommodation were significantly associated with depressive symptoms, which is consistent with the previous study (33). This may be explained by the fact that religious beliefs and practices often provide individuals with a sense of purpose, moral support, and coping strategies during stressful times, which can protect against depression. However, variations in religious affiliation or experiences of religious discrimination may contribute to psychological distress. Similarly, living with family is often perceived as a source of emotional support, but in some cases, it can also be a contributing factor to depression. Family-related stressors such as conflict, lack of understanding, high expectations, or controlling behavior may negatively affect an individual's mental well-being. In traditional societies, including ours, family pressure regarding academic performance, career choices, and social behavior can create a stressful home environment. Additionally, limited privacy and emotional independence may further intensify psychological distress.

In our study, the risk of depressive symptoms was higher among those students who shared their problems with friends. One possible reason may be that students who were already experiencing emotional distress were more likely to seek support from peers, indicating a pre-existing vulnerability to depression. Additionally, while peer support can be helpful, friends may lack the emotional maturity or skills to provide effective guidance, and in some cases, may even reinforce negative thoughts or offer unhelpful advice. This reliance on friends instead of seeking professional or adult support may leave underlying issues unresolved, contributing to ongoing or worsening depressive symptoms. In addition to this, depression was associated with those students who were worried about their future, which may be due to academic pressure, uncertainty about career prospects, and fear of failure. These concerns can lead to chronic stress and anxiety, increasing the risk of developing depressive symptoms.

Harassment in schools/ colleges was found to be significantly associated with depression, which was similar to findings from studies conducted in Lalitpur and Rupandehi districts (35). One possible reason may be that negative experiences such as a sense of fear or insecurity, feelings of isolation and helplessness within the academic environment can disrupt concentration, lower academic performance, and erode social support, all of which contribute to the development or worsening of depressive symptoms. Continued

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exposure to such a hostile environment may also prevent students from seeking help, further deepening their emotional distress.

This is one of the few studies that have measured the prevalence of depression among students of secondary public- schools in developing nations such as Nepal, which has recognized screening tools to assess depression. However, this study is cross-sectional, meaning it captures data at a single point in time. As a result, causal relationships between depression and associated factors cannot be established. The study relies on self-reported data where there is a chance of making a false or over-judgment due to stigma or misunderstanding of the questionnaire items and may be subject to recall bias and social desirability bias. Although statistical models were used to analyze associations, there may be unmeasured confounding factors related to family environment, school pressure, socioeconomic status, or personal history that could influence depression. Furthermore, the study used a specific screening tool to assess depression, which, while validated, may not fully capture the complexity of mental health conditions in diverse student populations. Thus, due to time limitations and accessibility challenges, this study might not be representative of all higher secondary school adolescents in Nepal.

Conclusion

The study reported a substantial burden of depression among secondary-level students in Tokha Municipality. The study reported a significant association with variables such as religion, place of accommodation with family, worried about the future, problems shared with friends, and being harassed in school/ college, etc. According to the measurement scale of CES-D, the prevalence of mild depression was found more compared to the moderate and severe forms of depression.

The prevalence of depression among the students is high compared to past research articles. Thus, from the earliest ages, students' participation in activities that boost social-emotional learning and school-based programs that strengthen youth's skills, modify the physical and social environment, are recommended to reduce the prevalence of depression among the students of the secondary public school of Tokha Municipality, Kathmandu. Parents should be encouraged to foster open communication with their children and provide necessary support. Furthermore, this study utilized a cross-sectional design that was useful for identifying the prevalence and its associated factors among students rather than establishing causality, so further research using more robust study designs, such as a longitudinal study, is recommended to better understand the progression of depression among students over time. The current study may have missed other influencing factors such as family environment, personal history, or individual coping skills. A more comprehensive approach is needed to explore these aspects and guide effective mental health interventions in schools.

Acknowledgement

We highly appreciate the support throughout this research project that we have received from Kantipur Academy of Health Science (KAHS), Kathmandu. We appreciate the support throughout this research project that we have received from Ms. Pooja Devkota and Mr. Prakash Datt Chataut of the KAHS, Kathmandu. We extend our warmest thanks to the respected principals of the schools who immensely helped by granting permission to conduct my research. The completion of this research project could not have been accomplished without the support of participants of school students.

Conflict of Interest

The authors have no conflicts of interest to declare. There are no financial interests to disclose, and each co-author has reviewed the manuscript and approved its contents. We certify that the contribution is original and not currently being reviewed by another publication.

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ISSN: 2976- 1077 (Online)

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