

Prevalence and Distribution Pattern of Mood Swings in Thai Adolescents: School-based Survey

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Research article

Keywords: Mood swings, Adolescent, Prevalence, Distribution

Posted Date: March 3rd, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-15845/v1>

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Version of Record: A version of this preprint was published at BMC Psychiatry on April 29th, 2020. See the published version at <https://doi.org/10.1186/s12888-020-02605-0>.

Abstract

Background: Mood Swings (MS) is a condition widely discussed as a prominent feature with psychiatric patients. However, there is a lack of research related MS. Methods: This school-based, cross-sectional study aimed to investigate the prevalence and distribution pattern of mood swings on personal and contextual determinants in Thai adolescent. The participants were 2,598 students in high school and vocational school in Bangkok and central region of Thailand. Results : the prevalence of mood swings was 26.4%. It was most frequent among the vocational students in Bangkok, there was 37.1%. The distribution of mood swings could be found in adolescents who had risk behaviors and who resided in hazardous situation. The probabilities of MS by characteristic in those 15 – 24 years old were: bullying involvement 36.9% (n=1293), problematic social media use 55.9%(n=127), high expressed emotion in family 36.6% (n=1256), and studying in vocational program 29.5%(n=1,216) and school located in Bangkok 32.4%(n=561). Also, substance use was a risk to MS as with cannabis 41.8%(n=55) and heroin users 48.0%(n=25). Hierarchical logistic regression analysis showed that being female, the family history of mental problems, bullying involvement, problematic social media use, high expressed emotion in family, and the interaction between vocational programs and metropolitan/urban residence were impacted adolescent mood swings ($p < .05$). Conclusions: our findings indicate that the pattern of mood swings was associated with significant bullying involvement, social media use, family circumstance and school characteristics. The public needs greater awareness of mood swings patterns and the positive implications of MS screening. Moreover, early preventive interventions which may stem later mental illness are needed. Keywords : Mood swings, Adolescent, Prevalence, Distribution

Background

Mental disorders represent a significant public health concern worldwide. Globally, 18–36% of the total population have a mental health problem such as depression, anxiety and thought disorders [1]. Mental disorders are associated with early mortality and all-cause of burden disease, contributing to 32.4% of years lived with disability (YLDs) and 13% of disability-adjusted life years (DALYs) [2]. Also, these diseases will cost the global economy through lost productivity [3]. Adolescents and young adults are at elevated risk for mental health problems, 3–22% of school-age children showed symptoms of mental health problems [4], with a majority of these symptoms continuing into adulthood. The premonitory signs identification of children with mental disorders can lead to early access to treatment and the reduction of the negative sequelae of mental illness. Mood Swings (MS) represent a common first sign of mental health problems among adolescents who feel stress and suffering the inability to control their moods.

Mood Swings referred to abnormal mood changes that are characterized by the oscillation, intensity, ability to regulate and affective change triggered by the environment but without a recognized, activated source. There are a variety of terms such as mood swings, affective instability, mood dysregulation, [5–7]. MS has become significantly more associated with general anxiety disorder, major depressive disorder, bipolar disorder and borderline personality disorder [8–10]. Evidence showed that nearly 90% of patients with mental health problems and psychotic symptoms have a ten-fold MS when compared with the

general population [11]. People with mood swings have a two times greater risk of suicide than a mentally stable person [12].

In Thailand, a nationwide survey reported an increased rate of mental health problems in adolescents as seen worldwide [13], with a corresponding delay in access to adequate mental health services. MS recognition helps to identify early phases of psychological problems, and further to help reduce the loss of quality of life as well as help alleviate the burden on social resources. MS prevalence is able to guide policy management and outline the provision and scaling up of appropriate mental service for adolescents. The principal of epidemiology requires an understanding of the distribution of determinants influencing the situation of interest. Generally, critically personal characteristics are associated with mental health problems. Beyond the primary traits of a person, the consequences of exposure to a hazardous situation such as poor communication in the family [14–15] and a high rate of bullying in school [16–17] are also crucial for adolescents.

The purposes of this study were to assess the prevalence and distribution patterns of mood swings in Thai adolescents, and select adolescent groups and the effect of personal and contextual determinants on mood swings.

Methods

Setting

Thailand is the country of Southeast Asian, composed of 76 provinces and comprises several distinct geographies in four regions, which are Northern, Northeastern, Central, and Southern. Bangkok is the capital city and the highest population density; it is one of 22 provinces in the central region.

Administrative, Thai provinces are divided into a central district and other districts. Compulsory education in Thailand is twelve years since 1997. In grades 10–12, upper secondary education is divided into two tracts, high school or vocational school. The high school track is a program focused on increasing specific knowledge and skills in line with capacities, aptitudes and interests of individual learners in regard to the academic and technological applications. The vocational education program is aimed to develop the knowledge and skills of the workforce to match the job market needs [18]. According to a previous study, high-risk behavior and mental problems amongst Thai youths were highest within areas of the central region and in vocational schools [19]. Thus, the presented study was the cross-sectional comprised of adolescents studying in grades 10–12 of high schools and vocational schools in the central region of Thailand plus Bangkok metropolitan area based on multi-stage simple random sampling and classroom cluster sampling framework.

The estimated upper secondary students of the central region of Thailand in 2015 was 628,059 [18]. The Lemeshow & Stroh (1988) method was used to determine the sample size required. The proportion of mood instability was based on previous studies at 12–16% [12, 20]. To achieve ± 5 precision, considering a 95% confidence interval, the estimated error was 10%. Based on previous evidence, we assumed an uncompleted questionnaire return rate via a web-based instrument of 30%. The total required sample size

was calculated to be 2,613. The inclusion criteria for students were: 1) 15 years old or above; 2) having a basic grounding in their mother tongue - Thai; and 3) having access to modern technology such as mobile phones and the internet. A total of adolescents (2,618) in 26 schools agreed to participate and 2,598 questionnaires were completed (99.24%) and returned via a smartphone application.

Measures

For mood swings assessment, we used the Affective Lability Scale-Short Form (ALS-SF) modified by Oliver and Simons (2004) [21] and contains 18 items. It used an anchored four-scale (0–3), ranging from "Very uncharacteristic of me" to "Very characteristic of me". Responses covered three domains: depression/elation (DE, 8 items), anxiety/depression (AD, 5 items) and anger (A, 5 items). The current study interpreted MS by using the score above the median of the three dimensions of the sample. Cronbach's alpha was .91 overall.

Personal determinants. Data were provided for sex (male/female/ nonnormative gender), the family history of mental problems divided into three categories (no/yes/uncertain).

The bullying involvement measure used the Illinois Bully Scale (IBS) [22]. IBS contains 18 items. The answers are scored within a framework of frequency for five subscales. Cronbach's alpha was .88 overall.

The Internet Addict Test (IAT) [23] was a self-assessment for social media use. The social media use refers to the use of application services on internet networks including chat, Facebook, Instagram, Skype, twitter and line via computer, laptop and mobile phone. IAT contains 20 items, a six scale (0–5). Cronbach's alpha in this study was .92.

The substance use was measured by Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST-Lite) in Thai version translated by Sawitri Assanangkornchai (2016) [24]. ASSIST-Lite classifies substance into seven categories: alcohol, tobacco, cannabis, opioid, sedatives, stimulants, other unknown. In this study, we added a question of energy drinks as recent evidence reports a high rate of energy drink use among Thai youth [25]. There were three items of the sub-question in each category and yes/ no scoring. The cutoff score associated with "likely substance use disorder" was 2. Cronbach's alpha in this study was .83.

Contextual determinants comprised the family context and school context. The family characteristics indicated family structure (both parents together/ single parent/ father or mother remarriage/ foster) and family circumstance refers to expressed emotion in the family. The expressed emotion in the family [26] was assessed using the Level of Expressed Emotion scale – 46 (LEE-46) as modified by William W. Hale III in 2014. It consisted of 5 domains: Lack of emotional support (LES; 19 items), Intrusiveness (INTR; 7 items), Irritation (IRR; 7 items), Criticism (C; 5 items), and Positive Criticism (PC; 8 items). The answers were scored from anchor-words from untrue to true (1–4). Cronbach's alpha in this study was .87.

School characteristics measured the education program and location of the school. The education program was classified into 2 categories: 1) general school and 2) vocational school. The sites of the

schools were categorized: 1) suburban, 2) urban and 3) Bangkok.

The authors applied the translation processes of the forward and back-translation method following WHO guideline for ALS-SF, IBS, IAT, and LEE-46.

Statistical analysis

Descriptive statistics were used to describe all study variables. Median was used to describe continuous variables with non-normal distribution. MS and all determinants were treated as categories and univariate binomial testing, chi-square test and Phi Cramer's V for categories variables and Kolmogorov-Smirnov test for distribution with a different significance level .05, which noted 15 outlier cases for further discussion. The assumption of logistic regression was assessed. The spearman-rank test for bivariate correlation was statistically significant at the .01 level, while not high ($r_s < .5$) or violating the multicollinearity assumption. Three separate hierarchical multiple logistic regression models were employed to identify the effect of independent factors on mood swings. The level of statistical significance was set at $< .05$ for all analyses.

Results

The participants' mean age was 16.88 years (S.D = 1.10, range 15–24) with 59.6% female and 8.7% of participants reporting a family history of mental problems. Almost one-half of the participants had experienced bullying (49.8%, median 13; Q1 = 8, Q3 = 21). Many participants (41.9%) indicated that they had experienced problematic social media use (Table 1).

Prevalence and Distributions of Mood Swings

The prevalence of mood swings was 26.4% which was significantly different for the small subgroup. Personal determinants, the participants who had problematic social media use had the highest prevalence rate of mood swings (55.9%) as presented in Fig. 1.

The Effects of Personal and Contextual Determinants on Mood Swings

In all, 2,598 students have completed ALS-SF questionnaire for mood swings screening. However, five were missing data of school variables so 2,593 students were included for model analysis. Evaluation of logistic regression models includes the assessment of multicollinearity and outliers. Exclusion of the outlier 15 cases did not improve the performance of the model, nor changed the significance of the parameter estimates for variables in the equation. Thus, the outlier cases were retained, and the original model was further evaluated and interpreted.

The logistic regression model, -2Log likelihood which examines whether values predicted by the model differ from observed values (-2Log likelihood changed = 361.64) and Hosmer & Lemeshow have indicated the model, both were an acceptable fit to the data ($\chi^2 = 398.53$, df = 20, p = .106).

Significant OR produced by the hierarchical logistic regression analyses are displayed in Table 2. The participants who had the family history of mental problems were twice as likely to have MS as those without ($OR_{adj} = 2.04$; CI 1.53, 2.72; $p < .001$) in the Block I. After controlling for unmodifiable person variables in Block II, those with bullying involvement were twice as likely to have MS as those with low/never bullying ($OR_{adj} = 2.381$; CI 1.952, 2.904; $p < .001$). Problematic social media use produced the highest MS risk, five times that of the standard group ($OR_{adj} = 5.080$; CI 3.425, 7.533; $p < .001$). Those with a tendency for such use were twice as likely to have MS as the standard group ($OR_{adj} = 2.394$; CI 1.963, 2.920; $p < .001$). Because of some substance use sub-group were too small, we grouped substance use into four categories (tobacco/alcohol drinking/ energy drinking/ illicit substance), with only illegal substance use (cannabis, stimulant, sedative, heroin and other substance such as tramadol, codeine, and procodyl) in the past three months related to MS ($OR_{adj} = 1.751$; CI 1.103, 2.780; $p < .05$).

The context included family and school characteristics. Only high expressed emotion in family effects mood swings when controlling the person variables ($OR_{adj} = 2.228$; CI 1.832, 2.710; $p < .001$) as shown in Block III. School characteristics (Block VI), show a tendency for vocational programs to be associated with MS ($OR_{adj} = 1.219$; CI 0.998, 1.490; $p = .053$) when compared to high school. Urban schools located in Bangkok area were 1.5 times more likely to show MS as sub-urban schools ($OR_{adj} = 1.566$; CI 1.195, 2.053; $p < .001$), so schools located in urban areas tended to have significantly higher MS ($OR_{adj} = 1.250$; CI 0.993, 1.575; $p = .058$). The final model, with an interaction between the education program and location of school showed MS effects of vocational schools in urban and Bangkok areas. There interaction variables produced almost two times the likelihood of mood swings as compared to high school in sub-urban area ($OR_{adj} = 1.756$; CI 1.081, 2.851; $p < .05$), ($OR_{adj} = 2.009$; CI 1.155, 3.494; $p < .05$) respectively. However, results in the whole model of independent variables, Nagelkerke's pseudo- R-square only explaining 20.8% of the variance in mood swings.

Discussion

The study found the prevalence of MS among Thai adolescents was 26.4%. It showed a higher rate of the prevalence compared to previous studies [12, 20], which could be due to the different populations, and sources of data. The population used in this study was adolescent 15–24 years in school-based sample, unlike earlier studies, participants were diagnosed or met criteria for diagnosis with mental problem and illness [20]. Regarding source data in previous studies, it was extracted from a part of the Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II) [12] and free text extracts clinical information that relevant keywords such as instability, mood, affect and emotion [20]. In the current study, we directly collected data from the participants by using ALS-18 questionnaire, which included depression, anxiety, elation, and anger, thereby screening several symptoms.

Being female increased the odds of MS supporting previous researches that revealed emotional problems were more common in school-age girls, and by early adulthood, women are more likely to be diagnosed with a mental health condition than men [27–28]. Attribution explained gender differences in social

inequalities, socioeconomic status, ethnicity, sexual orientation, and other factors intersect to impact women throughout the life course affecting their mental health [27].

Bivariate analysis showed the highest MS rate in those nonnormative genders. Although Thai sex norms are modern formations that have undergone a tremendous transformation over the last century, nonnormative gender continues to be less accepted as a gender norm and is still stigmatized [29]. For this reason, this gender is a stressor.

The family history of mental problems increased the odds of MS as scientific research of the phenotypes studies shown the mental illness in family history supports significant for mental health problems and disorders among relatives [30].

Bullying involvement appeared significantly associated with increased odds of MS is supported by previous work of bully and mental problems [31–32]. For problematic social media use, the current study shows both a trend to impact and get problems from social media in daily life was strongly increased the risk of MS also found in psycho-pathological such as depression, anxiety and suicidal ideation [33]. The primary developmental crisis in the adolescent period is self-identity (Erikson's Psychosocial development), the disjunction between a physical change and socially allowed independence. This period, when youth disengage from parents, can result in high levels of conflict and a concurrent status viewed as stressful. It may lead to taking risky behavior.

High expressed emotion in the family increased odds of MS. Family is an essential context for human development and mental health. Interaction patterns, communications, and emotional interactions between family members are associated with anxiety and depression among adolescents [27, 34–35].

Another study conducted in Thailand showed health risk behavior were high among vocational students [18] so that identification and planning of extra activities for delinquent vocational students were required [36] for the social stressor of these programs. We found that the prevalence of MS in vocational schools was higher than in general high schools (29.5% vs 23.7%). However, this alone was not a significant effect on MS in the logistic regression model, but the interaction between vocational school and urban and metropolitan locations significantly increased the risk of mood swings as compared to high school programs in the suburbs.

That the location of the school in the metropolitan area increased the odds of MS is supported by previous studies in Western and Asian countries where higher odds of mental problems were found in metropolitan and semi-rural areas than rural areas [37]. The reality of health problems and mental health problems in urban areas may be related to harmful social fragmentation and having low social capital-behavior networks among people [37]. The current study showed that schools in Bangkok had the highest frequency of MS. The final model presented significant increases in a risk for mood swings as an interaction of vocational schooling and Bangkok/ urban area, consistent with previous health and mental health studies in Thailand [38]. Although the urban areas of Thailand provide better access to health services, they also expose one to health risk and higher living costs. Many rural areas now have more

established medical facilities, and local social norms in rural areas are more supportive than positive health factors than in urban life [39].

Our results differed from previous research which reported significantly associated between substance use and mental problems and behavior problems, and suicide risk [40]. With limited numbers, less than 5% of our sample with substance use in subgroups, we did find a positive tendency of illicit substance use such as heroin, sedative use with increased odds of MS.

Conclusion

Our study contributes to scientific knowledge by providing the first epidemiological data on the prevalence of mood swings among adolescents in the school system. The result indicates a high prevalence of mood swings in adolescents aged above 15 years. Public awareness regarding mood swings should include in mental health policy and early intervention and prevention of mental health problems is provision. Mental health care personnel in the school should have knowledge and skill for providing screening, conducting early interventions, and monitoring and referral to higher competency professionals, as needed. It is essential to establish and develop the robust contextual support of adolescent. Critical responses to children and adolescent's emotional and mental health needs from parents and school providers are needed, especially critical in cities.

Strengths And Limitations

The prevalence and distributions of mood swings among school-age adolescents of different sexes, risk-taking behaviors, family circumstances, and residential locations were examined. Also, the knowledge of the personal and contextual determinants of mood swings could help fill the gap in knowledge of mental health in adolescents. The study provides empirical support for MS screening to prevent mental health problems.

As with any study, a significant limitation of the present study is the cross-sectional study design with a natural weakness of the time order necessary for a causal relationship. The present study recruited only youth in the regular school system. Thus, the pattern of mood swings might not be representative of youth outside the educational setting, with youth who have dropped out of the education system.

Based on findings from this and other studies, efforts should be made to more adequately investigate factors that contribute the mental health literacy, including mood management in the school. Longitudinal cohort studies are vital if we are to understand the impact of mood swing on physiological, behavioral, psychological, social and academic performance of adolescents and manage it.

List Of Abbreviations

A: anger; AD: anxiety/depression; ALS-SF: Affective Liability Scale-Short Form; ASSIST-Lite: Alcohol, Smoking, and Substance Involvement Screening Test; C: Criticism; DALYs: Disability-Adjusted Life Years;

DE: Depression/Elation; IAT: Internet Addict Test; IBS: Illinois Bully Scale; INTR: Intrusiveness; IRR: Irritation; LEE-46: Level of Expressed Emotion scale – 46; LES: Lack of emotional support; MS: Mood Swings; PC: Positive Criticism; YLDs: Years Lived with Disability

Declarations

Ethics approval and consent to participate: This study was approved by the Mahidol University Institutional Review Broad, Nursing (IRB-NS: No.IRB-NS2018/432.2102). Permission was obtained from school representatives to allow recruitment in their classrooms. Potential participants' parents were provided with written informed consent to allow their children to join the research project. After that, participants were provided with information and written informed consent as well. The research conforms to the provisions of the Declaration of Helsinki, the Belmont Report, CIOMS Guidelines.

Consent for publication: Not applicable.

Availability of data and materials: The datasets used and/or analyzed during the current study are available from the School of Graduate, Mahidol university on reasonable request.

Competing interests: The authors declare that they have no competing interests.

Funding: The authors did not receive any funding for this paper.

Authors' contributions: SA, AS, RP, MT contributed to conception and design. SA conducted the analysis, interpretation of data and drafted the initial manuscript. MT provided feedback on the initial analysis. AS, RP, MT revising it critically for important intellectual content, and final approval of the version to be published. All authors read and approved the final manuscript.

Acknowledgments: We are grateful to all adolescent and their caretakers, who agreed to participate in this study.

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Additional File Legends

Additional files: Table 1. Number and percentage of participants on personal and contextual determinants. Table 2. Binary logistic regression analyses of associations between personal and contextual determinants and mood swings among Thai adolescents. Figure 1. Prevalence rate of mood swings on personal determinants in Thai adolescents. Figure 2. Prevalence rate of mood swings on contextual determinants in Thai adolescents.

Figures

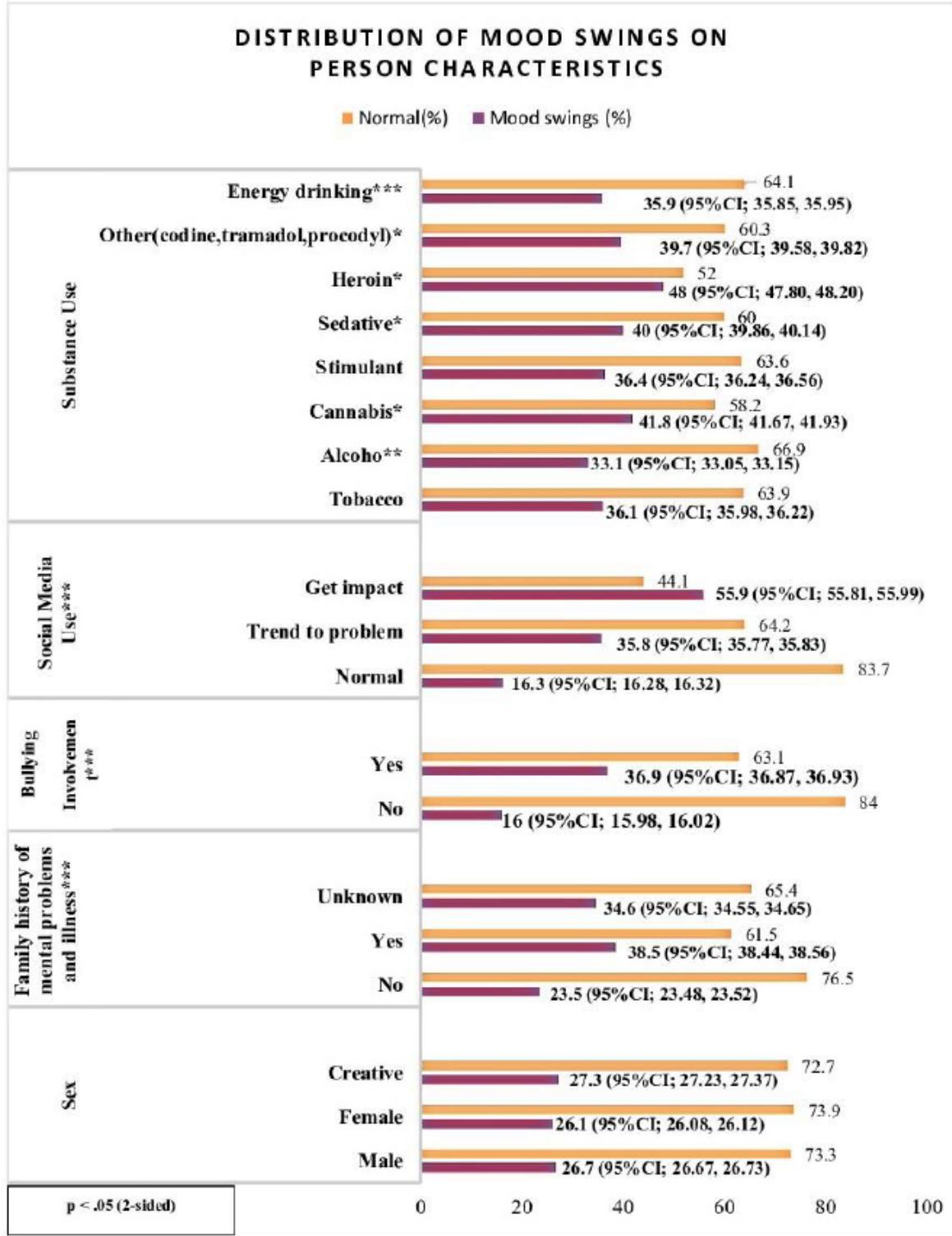


Figure 1

Prevalence rate of mood swings on personal determinants in Thai adolescent

Distribution of mood swings on education program and location of school

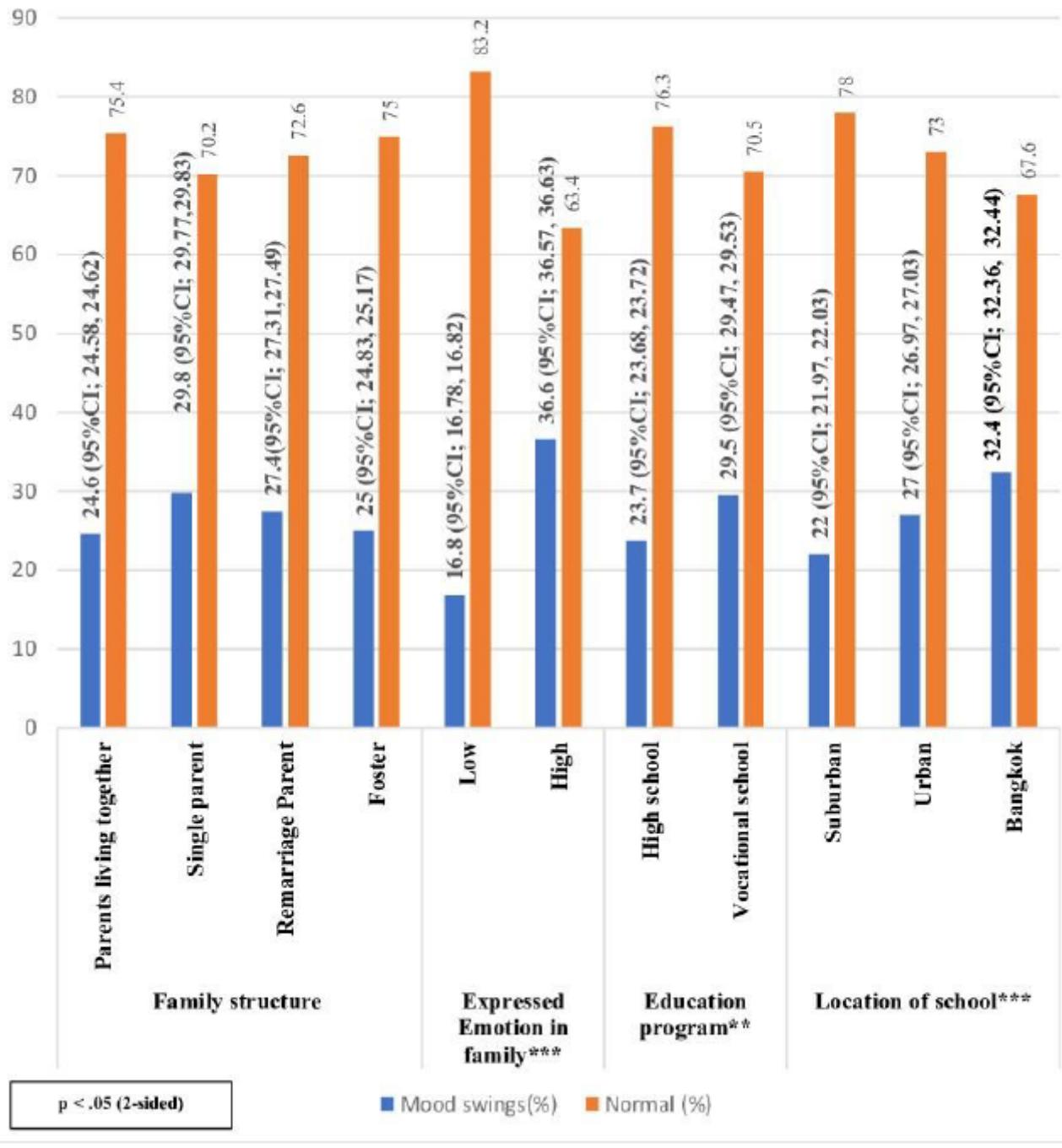


Figure 2

Prevalence rate of mood swings on contextual determinants in Thai adolescent

Supplementary Files

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- [Tables.pdf](#)