



## RELATIONSHIP BETWEEN MENTAL HEALTH DISORDER AND NAIL BITING IN CHILDREN

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### ABSTRACT

**BACKGROUND:** It is imperative to acknowledge mental health disorder in order to improve human resources, especially children and teenagers because they are nation's next human resources. Nail biting is suspected as a sign and symptom that someone has mental health disorder or suffers certain psychiatric condition.

**OBJECTIVE:** The aim of this study is to evaluate the relationship between mental health disorder and nail biting in children.

**Methods:** A cross-sectional study was conducted in March 2016 in Singkuang village, Muara Batang Gadis district, North Sumatera, Indonesia. The samples were elementary, junior high school, senior high school students. All samples were required to fill in two questionnaires, those are nail biting and strength and difficulty questionnaire. Univariate, bivariate (chi-square), and multivariate analysis by logistic linear regression was performed with confidence interval 95%.  $P < 0.05$  was statistically significant.

**RESULT:** There were 583 samples and 140 (23.6%) among themselves had nail biting habit. There were relationship between emotional problem ( $P = 0.004$ ;  $PR = 1.803$ ) and peers problem ( $P = 0.021$ ;  $PR 1.639$ ) to nail biting habit. The nail biting risk factors in this study were nail biting family history ( $PR = 4.575$ ; 95%  $CI 2.451-8.539$ ) and emotional mental disorder ( $PR = 1.741$ ; 95%  $CI 1.062-2.855$ ).

**CONCLUSIONS:** There were relationship between emotional disorder and peers problem to nail biting habit. We found nail biting family history and emotional disorder as the risk factors of nail biting in this study.

**KEYWORDS :** Mental health disorder, nail biting, children, risk factors

### INTRODUCTION

Normal mental health is a state where mental health condition is productive and good relationship with others, and sufficient effort to overcome difficulty (Knopf D, 2008). In children, this definition include variety emotional and behaviour problem in which doesn't correlate with mental health disorder or psychiatry (Warner LA, 2010)

From the survey of national health policy showed us that the mental health and emotional ratio in children, ages were 4-15 years old, was 104 / 1000 children in 2001-2005. In a prevalence study in Jakarta in 2003, the prevalence of emotional and behaviour problem in primary school students were 27% by using Child behavior checklist instrument. Boys prevalence was greater than girls (30.5% vs 22.6%) (Widya W, 2008)

The prevalence of mental health disorder patients in Indonesia was 11,6% according to Risesdas 2007. These patients reached 1.7 million people in 2013 in Indonesia (Risesdas, 2007; Risesdas 2013)

A study in Jakarta stated that the mental health disorder prevalence in Junior High School in Central Jakarta by using Mini for Kids instrument was 26.5%. The mental health disorder was mostly found in girls rather than boys (Widya W, 2008)

Nail biting in children and teenager is commonly referred to mental health clinic. Nail biting often happens in children and undertreated. The incidence is higher in 4 to 6 years old children compared to younger children. The incidence increases in teenager and decreases in adult. Nail biting is not influenced by sex in children less than 10 years old. But the male teenagers often have this habit (Ghanizadeh A, 2011) Nail biting can cause complications such as front dental malocclusion, dental root resorption, intestinal parasite

infection, bacterial infection, and alveolar destruction. A study in Iran by Ahmad Ghanizadeh, et al, in 2011, showed that prosocial, emotional, and conduct score in Strength and Difficulty Questionnaire (SDQ) are statistically different between the nail biting children compared to non nail biting children. Prosocial score in children with nail biting is lower than the others. Emotional score and conduct score are higher in nail biting children. From that result, it is suggested that mental health disorder is more common in nail biting children. But a study in Poland in 2014 didn't show any correlation between nail biting and obsessive-compulsive disorder or anxiety disorder (Przemyslaw P, 2014)

### MATERIAL AND METHODS

This was an observational cross-sectional study in Singkuang, Muara Batang Gadis district, North Sumatera, Indonesia. It was conducted in March 2016. The target population was students of primary, junior high school, and senior high school who had nail biting habit. Psychiatric patients, children with previous nail biting, skin infection before were excluded from this study. The subjects were required to fill in SDQ and nail biting questionnaire. This study had been approved by Universitas Sumatera Utara ethic committee. All subjects were required their parents' consent. Subjects' age 11-17 years old could fill in the SDQ and nail biting questionnaire by themselves. As the others by their parents. Then the scores of SDQ were evaluated by the researcher. The score consisted of emotional, conduct, hyperactivity, peers, and prosocial problems. All of the data were evaluated, analyzed by chi-square, multivariate analysis by logistic regression where  $P < 0.05$  was statistically significant in 95% confidence interval. The data was analyzed by SPSS software (version 22).

Nail biting was defined as an act of inserting finger into the mouth or a contact between nails and mouth. Strength and difficulties questionnaire was a questionnaire that should be

filled in 5 minutes by parents or by respondents. It consisted of 25 questions. It included 5 sub-scale such as emotional, conduct, hyperactivity, peer, and prosocial problem. The scores were interpreted as normal, borderline, and abnormal. In this study, the borderline scores were interpreted as abnormal.

**RESULTS**

There were 606 students in this population and 593 samples met the inclusion criteria. There were 140 students had nail biting habit. There were 48,6% male students who had nail biting habit while 51,4% female students who had nail biting habit.

**Table 1. Samples characteristics**

Characteristics	n=593
Age average, years (SD)	12,28 (3,142)
Sex, n (%)	253 (42,7)
Male	340 (57,3)
Female	
School grade, n (%)	305 (51,4)
Primary school	184 (31)
Junior high school	104 (17,5)
Senior high school	
Nail biting habit, n (%)	140 (23,6)
Yes	453 (76,4)
No	
Nutritional status, n (%)	297 (50,1)
Well nourish	155 (26,1)
Mild malnutrition	24 (4)
Severe malnutrition	73 (12,3)
Overweight	44 (7,4)
Obesity	
Family income, n (%)	57 (9,6)
< 500,000 IDR	305 (51,4)
500,000 to 1,000,000 IDR	231 (39)
> 1,000,000 IDR	
Parents education, n (%)	401 (67,6)
Primary school	106 (17,9)
Junior high school	64 (10,8)
Senior high school	11 (1,9)
College	11 (1,9)
None	

**Table 2. The frequency of nail-biting habit.**

Frequency of nail biting	n=140
Frequency of nail biting / day, n (%)	30 (21,4)
Frequent (5-6 times / day)	110 (78,6)
Rarely (1-4 times / day)	
Frequency of nail biting / week, n (%)	
Frequent (4 days in 1 week)	34 (24,3)
Rarely (1-3 days in 1 week)	106 (75,7)

The SDQ evaluation showed the majority was normal results. The amount of abnormal scores was 28.8% in emotional problem, 24.1% in peer problems, 23.4% in conduct problems, and 8.8% in hyperactivity problems.

**Table 3. Characteristics of SDQ evaluation**

SDQ characteristics	n=593
Emotional problem, n (%)	422 (71,2)
Normal	171 (28,8)
Abnormal	
Conduct problem, n (%)	454 (76,6)
Normal	139 (23,4)
Abnormal	
Hyperactivity problem, n (%)	541 (91,2)
Normal	52 (8,8)
Abnormal	
Peer problem, n (%)	450 (75,9)
Normal	143 (24,1)
Abnormal	
Prosocial problem, n (%)	511 (86,2)
Normal	82 (13,8)
Abnormal	
Total scores, n (%)	
Normal	394 (66,4)
Abnormal	199 (33,6)

Bivariate analysis by using chi square showed that there were a statistically significant relation between emotional problem and nail biting (P = 0.004), between peer problem and nail biting (P = 0.021).

**Table 4. Relationship between mental health problem parameter and nail biting.**

	Nail biting	P*	Prevalence Ratio	95% Confidence interval		
	Yes	No				
Emotional problem	Abnormal (%)	38.6	25.8	0.004	1.803	1.209 – 2.69
	Normal (%)	61.4	74.2			
Conduct problem	Abnormal (%)	29.3	21.6	0.062	1.5	0.979 – 2.3
	Normal (%)	70.7	78.4			
Hyperactivity problem	Abnormal (%)	12.1	7.7	0.106	1.651	0.894 – 3.048
	Normal (%)	87.9	92.3			
Peer problem	Abnormal (%)	31.4	21.9	0.021	1.639	1.076 – 2.496
	Normal%	68.6	78.1			
Prosocial	Abnormal (%)	17.9	12.6	0.114	1.51	0.903 – 2.525
	Normal (%)	82.1	87.4			
Total score	Abnormal (%)	39.3	31.8	0.101	1.388	0.938 – 2.056
	Normal (%)	60.7	68.2			

\*Chi square

Bivariate analysis between other factors and nail biting showed there was relation between nail biting history in family and nail biting habit (P < 0.001).

**Table 5. Other risk factors and nail biting**

	Nail biting	P*	Prevalence Ratio	95% Confidence interval		
	Yes	No				
Sex	Male (%)	48.6	40.8	0.106	1.368	0.935-2.002

	Female (%)	51.4	59.2			
School grade	Primary school (%)	50	51.9	0.819		
	Junior high school (%)	30.7	31.1			
	Senior high school (%)	19.3	17			
Nail biting in family	Yes (%)	20	5.3	<0.001	4.469	2.493-8.010
	No (%)	80	94.7			
Live among family	Yes (%)	97.9	95.6	0.224	2.109	0.617-7.206
	No (%)	2.1	4.4			
Nutritional status	Severe malnutrition (%)	7	5.1	0.118		
	Mild malnutrition (%)	27.1	25.8			
	Well nourish (%)	55.7	48.3			
	Overweight (%)	10.7	12.8			
	Obesity (%)	5.7	7.9			
Family's income	< 500,000 IDR (%)	7.1	10.4	0.482		
	500,000 to 1,000,000 IDR (%)	54.3	50.6			
	> 1,000,000 IDR (%)	38.6	39.1			
Parents' education	Primary school (%)	70	66.9	0.661		
	Junior high school (%)	15.7	18.5			
	Senior high school (%)	12.1	10.4			
	College (%)	7	2.2			

The logistic regression analysis showed that emotional problem and nail biting in family were the risk factors of nail biting in this study. The prevalence ratio were 4.225 (95% CI 2.282-7.821) and 2.261 (95% CI 1.228-4.164).

**Tabel 6. Risk factors of nail biting**

	P	PR	95% CI
Sex	0.110	0.701	0.453-1.083
Nail biting in family	0.0001	4.225	2.282-7.821
Live among parents	0.134	2.836	0.727-11.067
Mild malnutrition	0.459	0.724	0.308-1.703
Severe malnutrition	0.474	0.714	0.284-1.795
Overweight	0.128	5.509	0.610-49.726
Obesity	0.800	0.880	0.328-2.363
Emotional problem	0.009	2.261	1.228-4.164
Conduct problem	0.270	1.375	0.781-2.422
Hyperactivity problem	0.754	1.122	0.546-2.308
Peer problem	0.160	1.446	0.864-2.421
Prosocial	0.459	1.238	0.704-2.178

**DISCUSSION**

According to WHO in 2007, mental health was defined as a welfare state where every individu aware his potential, can resolve stressor in daily living, can work productively, and can contribute to his community. (Kessler RC, 2009; Kelsay K, 2009). A study in India showed that the prevalence of mental emotional disorder child ages under 16 years old was 12.5% (Warner LA, 2010).

Our study didn't perform a research to a specific mental disorder. We perform a research of mental health parameter such as emotional, conduct, hyperactivity, peer, and prosocial problem. The prevalence of emotional disorder in our study was 28.8%. The other problems were conduct, hyperactivity, peer, prosocial problems. The prevalence of each of them was 23.4%, 8.8%, 24.1%, 13.8%.

SDQ is a screening tool for children ages 4-16 years old. There are several versions to meet researcher, clinician aspect. It is widely used as a screening tool. The benefit of SDQ are that it includes a variety of ages, it is available in multilingual. Its sensitivity is 85% and specificity is 80% (Strength and difficulty questionarre, 2016; Nothern California Training Academy, 2008)

According to International Classification of Diseases and Health Related Problems – 10 (ICD-10), nail biting is classified as emotional and health disorder that starts since kids and teenage. This habit is also accompanied with other habits such as excessive masturbation, nose picking, and thumb sucking (Przemyslaw P, 2009)

Nail biting is defined as an act of inserting any finger into the mouth or an act of inserting at least one finger and or bite it. (James SB, 2007) This habit usually starts when a child is 3-4 years old. The prevalence increases as the age increases. The prevalence of nail biting in children age 7-10 years old and in teenagers is approximately 20%-33% and 45% (Ghanizadeh A, 2011). The prevalence in our study was 23.6%

Nail biting can cause several complications such as relationship problem because of shame, often receive abuse from friends, higher oral infections that can be caused by *Enterobacteriaceae*, dental root resorption (Ghanizadeh A, 2011)

It was stated in a study in Iran in 2011 that boys with nail biting had lower prosocial score than the one without this habit. It also showed that age and prosocial score was associated with

nail biting (Ghanizadeh A, 2011). While a study in Kuba stated that the risk factors of nail biting were low birthweight, a child who didn't exclusively breastfed, and disharmony family (Romagosa DER, 2014). Our risk factors findings were different with other studies. Those were nail biting in family and abnormal emotional problem score.

Nail biting can be associated with other psychiatric conditions such as anxiety, obsessive compulsive disorder. The relationship between nail biting with anxiety is still controversial because several studies fail to show the increment of anxiety disorder prevalence. This result is consistent in obsessive compulsive disorder (Halteh P, 2017). But a study in USA showed that there was an increment in prevalence of psychiatric disorder in nail biting groups compared to the other group (18% vs 6%), Unfortunately, there wasn't any specific psychiatric disorder stated in that study (Winebrake JP, 2018).

This study still had several limitations. We didn't analyze complete risk factors of mental health disorder, that was, psychiatric disorder in the family. Identification of mental health risk factors in this population had never been performed before. We still hadn't analyzed other risk factors of nail biting in this study. We used questionnaire to evaluate parameters of nail biting and mental health disorder. It is encouraged to perform a better study design to analyze the relationship between mental health disorder and nail biting.

## CONCLUSION

Mental health disorder is a state when someone cannot realize the potential of himself, overcome stressor in daily living, work productively, and contribute to his community. We can use SDQ questionnaire to analyze one's mental health. It is assumed that prosocial score is lower in nail biting group.

We found that the prevalence of nail-biting group was 23.6% and the percentage in female sex was higher. We found that emotional and peer problem were significantly correlated with nail biting habit ( $P = 0,004$  and  $P = 0.021$ ). The risk factors of nail biting in our study were nail biting in family and abnormal emotional score.

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