

Self-injurious Behavior of Children with Autism in Vietnam: Across Sectional Study

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ABSTRACT

This study explored self-injurious behavior (SIB) of autistic children in Vietnam through a cross-sectional design. 60 informants, including 57 parents and 3 caregivers completed the questionnaire on problem behavior consisting of aggression, self-injury, stereotyping, property destruction, other problem behaviors and their functions. Results revealed that children experienced all mentioned problem behaviors, especially self-injurious behavior. The topographies of self-injurious behavior of the children included head-hitting, head-scratching, head-banging, hair-pulling, face-hitting, face-puncturing with a pen, ear-scratching, lip-picking, hand-biting, hand-scratching, hand-pinching, and belly-scratching. The most common area of self-injurious behavior is the head. The functions of these problem behaviors were expressed in four types (social positive reinforcement, social negative reinforcement, automatic positive reinforcement and automatic negative reinforcement). Social positive reinforcement appeared as a prominent function. Out of these 57 children, 21 of them who were autistic with self-injurious behavior went through a functional assessment (FA) in which the four conditions known as attention, tangible items, escape from task/activities, automatic stimulation were tested. The results of functional analysis (FA) further indicated the correspondence between the FAST-R and FA outcome on function of problem behavior, especially self-injurious behavior. Results also showed that the prominent function of these self-injurious behaviors was social function. It means self-injurious behaviors usually occur within a condition of social interaction, especially, in this present study, in the tangible condition. The antecedent of self-injurious behavior is the removal of tangibles (e.g. food, preferred items). This paper contributes to our knowledge of self-injurious behavior of children with autism in Vietnam where empirical research of this field was still *very rare*.

Key words: self-injurious behavior, autism, children, Vietnam

Introduction

The participants in this study are autistic children who are identified as demonstrating self-injurious behavior (SIB). The study aims to contribute to the knowledge on topographies of SIB of

Vietnamese children with autism and contribute to an informed behavior intervention for the SIB.

Self-injurious behaviors originate from stereotypic movements (e.g. body-rocking, hand-shaking or waving, head-

banging), which eventually developed into complex stereotypic movements. Those with complex stereotypic movements may appear SIB, which may continue for several years (DSM – 5 and ICD 307.3; F98.4).

Research concludes self-injurious children demonstrates the following characteristics approximately 80% SIB appear before 24 months of age; 12% appear between 24 and 35 months of age; about 8% appear at about 36 months of age. Further studies also conclude that the onset of SIB in some children with autism spectrum disorder is from 6 to 18 months of age (Dimian et al., 2017; Fodstad, Rojahn, & Matson, 2012; Richman, 2008); 16 months of age (Berkson et al., 2001); before or after 25 months of age (Kurtz et al., 2003; Richman & Lindauer, 2005).

Moreover, SIB is common in children with ASD. 50% of the children in the study had autism spectrum disorder related to self-injurious behavior, with 14.6% severe (Pascal, Grisi, & Aussilloux, 2003). Indeed, these behaviors have serious consequences by inhibiting children's development. An analysis of cross-sectional and retrospective studies about SIB in autistic children, concluded that there are specific signs which indicate the early development of SIB (Fodstad et al., 2012; Furniss & Biswas 2012; Richman & Lindauer 2005). These signs include body-moving, hand-shaking repeatedly is considered as a potential risk factor that can lead to SIB (Rojahn et al., 2015). However, not all stereotypic movements lead to SIB (Dimian 2017). Barnard-Brak et al (2015) on their cross-sectional study with 1871 children and adolescents concluded that stereotypic movements predicted SIB among 69% of

the total participants. Moreover stereotypic movements did not predict SIB among 31% of the total participants. This study also identified specific stereotypic movements (screaming, body-moving) that predict SIB.

The correlation of stereotypic movements and SIB invites comment. Although stereotypic movements promote SIB, these two types of behaviors are different in behavioral and neurobiological characteristics (Bishop et al., 2013; Miranda et al., 2010; Richler et al., 2007; Wolff et al., 2016, cited in Dimian et al., 2017).

Children who contract ASD within 24 months of age are more likely to be infected with SIB compared to children without ASD (Dimian et al., 2017). These results confirm previous research (Baghdadli et al., 2008; Berkson et al., 2001; Schroeder et al., 2014). Moreover, the onset of SIB varies over time depending on the child's clinical condition and patterns of repetition and stereotypies (Richman & Lindauer, 2005).

In fact, the process of SIB development remains unclear. Nevertheless, the results from two research projects (one a cross-sectional study, the other a longitudinal study), concluded that, in general, hitting one's head against something (such as a wall, pillow, or floor) is the earliest SIB indicator in the first stage of child development (Berkson et al., 2001; MacLean & Dornbush, 2012; Kurt et al., 2012).

A longitudinal study by Dimian et al., (2017), which monitored and observed children with SIB from 12 months to 24 months of age, determined that head-hitting and self-biting were common behaviors from 12 to 24 months of age. In

contrast, while these behaviors often persisted, other behaviors such as scratching and hair-pulling (47%) decreased.

The following are conclusions generated from the research concerning self-injurious behavior in autistic children

Frequency: SIB in children with ASD is twice as often as in children without ASD.

Time of onset: has not been clearly clarified, but in general, SIB appears at the time of the child's early development stage and is common in children with 24 months of age or before.

Topographies of SIB: the head is the common position.

Characteristics of SIB: Although repetitive and stereotypic movements can develop into SIB, the two types of the behavior differ in their behavioral and neurobiological properties. Self-injurious behavior appears and develops, increases or disappears depending on the child's diagnosed clinical condition.

Hidden risk factors can develop into SIB: stereotypic and repetitive behaviors such as shouting, body swaying, hand shaking, rhythmic and repetitive waving. Noted that, not all repetitive and stereotyped behaviors lead to SIB.

Classifications of SIB: SIB can be generated from topographies, mental health condition and functions of behavior.

Gorman-Smith and Matson (1985) review of 39 studies on stereotypic movements and behavioral therapy of SIB, from 1976 to 1983, concluded that the common position of SIB is head-hitting and head-banging; Kahng et al. (2002) surveyed 396 articles from 1964 to 2000 and asserted that the most common behaviors of SIB were head-banging,

head-hitting, and self-biting. Similarly, Erturk, Machalicek and Drew (2018) reviewed 46 articles. The results indicated that the most common type of SIB is head-banging, head-hitting, self-biting and self-hitting. Consequently the common topographies identified through these studies are head-hitting and head-banging. In contrast, neuroscientists believe that SIB in children with autism is accompanied by mental health problems such as depression disorder and anxiety disorders (Sturmey, 2012), stress, hyperactive disorder (Volkmar et al., 2014). In addition, SIB may be understood by the functions of behavior (Neidert et al., 2013). Specifically SIB may be classified as socially-mediated SIB or automatic reinforced SIB (independent from social interaction).

From the perspective of the functional behavior approach, SIB is a communication functional behavior, because children communicate to convey a message in order to satisfy a need, or to maintain a particular type of reinforcement (Jennett et al., 2011).

While research (reference) offers a clearer understanding on the development of SIB, the classification of it and the models to interpret SIB, there are few studies on SIB in Vietnamese autistic children. This present study aims to adapt the model functional analysis (FA) to evaluate the SIB in Vietnamese autistic children. The dominance of FA motivates clinicians to not only to accurately recognize SIB itself, but also to determine the functions of its behavior. Knowing the functions of behavior assists clinicians to develop appropriate behavior intervention for SIB.

Basically, this present study intended to address the following questions:

1. What are the topographies of self-injurious behavior of Vietnamese children with autism?
2. How does the self-injurious behavior occur?
3. Why does the self-injurious behavior occur?

Methods

In order to explore the self-injurious behavior and the functions of behavior of children with autism, the present study employed cross-sectional design, particularly the descriptive method. The descriptive method used in this present study mostly aimed to provide estimates of prevalence of self-injurious behavior and functions of behavior of children with autism.

As such, in order to address the research questions, the study used functional analysis (FA) to analyze the data. This strategy includes three steps: indirect assessment, direct assessment (observation) and functional analysis. For indirect assessment, the researchers employed the revised version of Functional Analysis Screening Tool (FAST-R) to collect the data on problem behavior including the self-injurious behavior and the functions of the behavior of the children with Autism Spectrum Disorder (ASD). For direct assessment (observation), the researchers tested the conditions containing relevant antecedents and consequences for self-injurious behavior. Then, for functional analysis (FA) part, the researchers documented behavior across conditions and assess trends.

Participants

The participants in the indirect assessment were 60. They are Vietnamese. They live in Hue, Vietnam. They were 34 female and 26 male who were the mother or father or caregiver of the 57 children who received treatments at the three centers in Hue.

The participants in the direct assessment (observation) were 21 who met the inclusion criteria of the study, meaning they were children with autism and self-injurious behavior.

Measures

Demographic questionnaire for the children. The demographic information for the children includes age, gender, and the name of the center.

The Functional Analysis Screening Tool (FAST-R). This scale was developed by Iwata and DeLeon (2005) and validated by the same authors in 2013. This scale was used for this present study to measure the problem behavior and the functions of problem behavior of the participants. The scale includes three parts: Informant-Client Relationship; Problem Behavior Information, including aggression, self-injury, stereotyping, property destruction and others; and the functions of the problem behavior with 16 items were categorized into four functions as follows: (a) access to attention or tangible items (social-positive reinforcement), (b) escape from task demands (social-negative reinforcement), (c) self-stimulatory behavior (automatic-positive reinforcement) and (d) alleviation of pain or discomfort (automatic-negative reinforcement). So, the purpose of the scale is to test whether the source of reinforcement was social or automatic.

The reliability of the FAST-R is moderate at best. (Iwata, Deleon, & Roscoe, 2013).

Procedure

The FAST-R scale initially translated into Vietnamese. Later, the Vietnamese version was translated back into English by a native Vietnamese, who is fluent in both languages. Revisions were made, for the Vietnamese version and English version, to ensure that all terms had been accurately translated and understandable for the participants.

For the first phase, the indirect assessment, the FAST-R was first distributed to the informants who were parents and the caregivers of the 57 children with autism. The researchers collected the data in this phase, analyzed the results, and then used the results to build on the second phase, the direct assessment. The participants of the direct assessment (observation) were 21 children. The other 36 children were excluded because they did not meet the inclusion criteria of the study. Lastly, the researchers made the functional analysis (FA) to find out why the self-injurious behavior occurred with the children. The study also made a comparison with FAST-R data and FA data to see whether or not there was a difference in the functions of problem behavior identified by FAST-R and the functions identified by FA.

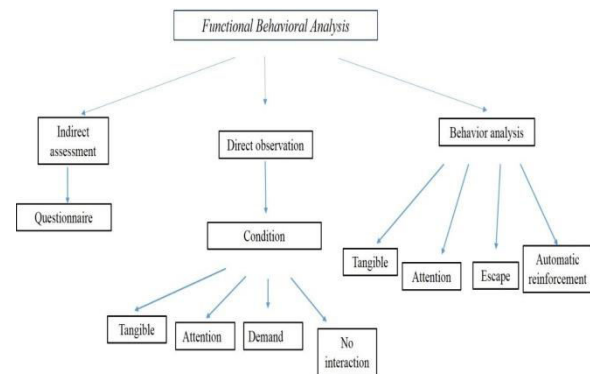


Figure 1. Adapted Model of Functional analysis (FA) for the present study

The following stages structure the conduct of the research:

Stage 1: Indirect assessment of self-injurious of behavior by engaging with parents and caregivers, who were directly involved with the children;

Stage 2: This involved direct assessment (observations) in which the observers directly observed and interacted with the children in four conditions designed according to research objectives;

Stage 3: This involved an analysis of function of self-injurious behavior based on indirect and direct assessment results.

Data Analysis

In this study, descriptive statistics were used to analyze the data using SPSS version 25.0.

Results

Indirect assessment

Demographic profile of the participants. The results of descriptive statistics as shown in Table 1 indicated that the selected sample in this study consisted of 57 children with Autism Spectrum Disorder (ASD), who are receiving intervention at three centers in Hue. Their age ranged from 3 to 7 years ($M = 4.70$ years). They were 47 male (82,5%) and 10 female (17,5%).

Table 1. Demographic profile of the participants

	mean	SD
Age	4.70	1.21
Gender	Frequency (f)	Percentage (%)
Male	47	82,5
Female	10	17,5

Problem Behaviors for which FAST-R were collected. Table 2 presented the problem behaviors collected from FAST-R analysis. Several problem behaviors were indicated such as noncompliance (12%), aggression (20%), self-injury (29%), inappropriate verbal and non-verbal (11%), stereotyping (25%), and other behaviors (e.g.nail-biting, thumb-sucking) (3%). Self-injurious behavior appeared as the highest percentage of problem behaviors (Table 2).

Table 2. Problem behaviors of the participants

Problem behavior	Frequency (f)	Percentage (%)
Noncompliance	1	12%
Aggression	15	20%
Self-injury	21	29%
Inappropriateverbal and non-verbal	8	11%
Stereotypy		
Other (nail-biting, thing-sucking)	19	25%
Total	74	100%

Frequency, severity, onset of the problem behavior.

To assess on how often the problem behavior occurred, the behavior was broken down by frequency as follows hourly, daily, weekly and less often. The result revealed that the behavior occurred hourly (73,2%), daily (10%), weekly (7,1%) and less often (2%). As such, the frequency of behaviors most reported by parents and caregivers was hourly. In terms of severity, the problem behaviors were reported as mild (73,7%), moderate (19,3 %) and severe (3,5%). The onset of the behavior appeared more before 24 months (62,5%) of age compared with the other two periods before 12 months of age (8,9%) and 36 months of age (12,5%) (Table 3).

Table 3.Frequency, severity and onset of the problem behavior

	Frequency (f)	Percentage (%)
Frequency		
Hourly	41	73.2
Daily	10	17.9
Weekly	4	7.1
Less often	2	1.8
Total	57	100
Severity		

Mild	42	73.7
Moderate	11	19.3
Severe	2	3.5
No answer	2	3.5
Total	57	100
Onset of the problem behavior		
Before 12 months of age	5	8.9
Before 24 months of age	35	62.5
Before 36 months of age	7	12.5
No answer	9	16.1
Total	56	100

Functions of the problem behaviors for which FAST were collected

The results of FAST-R were analyzed separately between the group of parents and caregivers. The result of descriptive statistics showed that: For the group of parents, the total score of attention or tangible items is 150, of escape is 112, of sensory stimulation is 113, and of pain attenuation is 115. For the group of caregivers, the total score of attention or tangible items is 137, of escape is 108, of sensory stimulation is 83 and of pain attenuation is 69. Within these four functional categories (attention or tangible items, escape from task/activities, sensory stimulation and pain attenuation), attention or tangible items appeared to be the highest trend of the children's problem behavior. It also is interesting to note that in both reports of parents and caregivers the attention or tangible items was reported to be the most common trend of the children's problem behavior. The total score of 'escape' ranked second in the four functional categories in caregivers' report, the total score of 'pain attenuation' ranked

second in the four functional categories in parents' report (Figure 2).

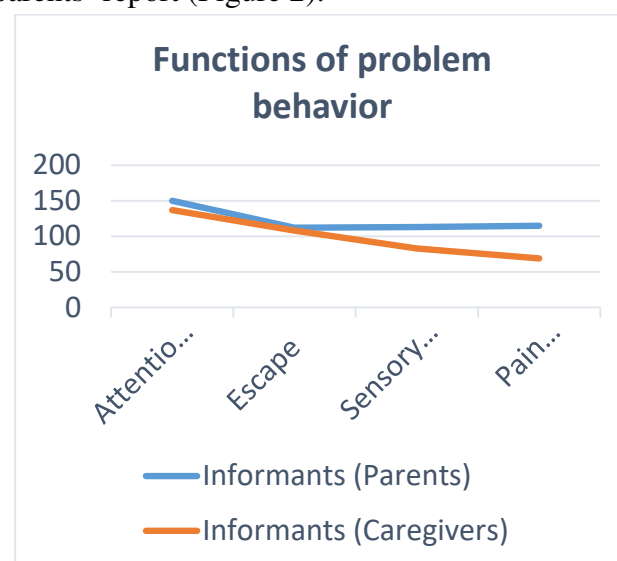


Figure 2. The functions of problem behavior reported by parents and caregivers

Topographies of self-injurious behavior

Out of 57 children surveyed, 21 met the criteria of the study (autism with self-injurious behavior). Results of self-injurious behavior (SIB) of 21 children indicated different topographies of SIB including head (Head-hitting against the floor, head-hitting against the door, head-scratching, head-banging against the wall,

hair-pulling), face (face-hitting, face-puncturing with a pen), ear (ear-scratching), lip (lip-picking), hand (hand-biting, hand-scratching, hand-pinching), belly (belly-scratching). Among these topographies, the position of head is the most common topography (table 4). These results were presented according to the

number of children engaging in the position of behavior: *General* represented 17 to 21 cases involving in the same topography of behavior; *typical* represented 9 to 16 cases involving in the same topography of behavior and *variant* represented 2 to 8 cases involving in the same topography of behavior (table 4).

Table 4. Topographies of self-injurious behavior

Topographies	Description	Frequency
Head	Head-hitting against the floor, head-hitting against the door, head-scratching, head-banging against the wall, hair-pulling	General
Face	Face-hitting, face-puncturing with a pen	variant
Ear	Ear-scratching	variant
Lip	Lip-picking	variant
Hand	Hand-biting, hand-scratching, hand-pinching	typical
Belly	Belly-scratching	variant

Note: N= 21; General = 17- 21 cases; Typical = 9 -16 cases; Variant = 2 – 8 cases

Direct assessment (observation)

The direct assessment (observation) on children's SIB was conducted focusing on the four conditions known as tangible, attention, demand and alone (no interaction). 21 children who met the criteria of the study were directly observed using the four designed conditions: tangible, attention, demand, and alone (no interaction).

Tangible: Children are placed in a condition with items they love. During the allotted time (20 minutes), the observer removed the child's preferred item, every 2 minutes and observed whether or not SIB occurs. So, the antecedent of SIB is the removal of tangible (e.g. food, preferred toys, v.v.). This process was repeated 10 times within 20 minutes. The tester observed and recorded the number of

times (if any) the child engaged in SIB and recoded observations.

Attention: The observer provided the child with a basket of toys and placed the child next to the observer. Within 20 minutes, the observer ignored the child. In other words, the observer's attention was diverted from the child. Then the tester observed how SIB occurs with the children in order to attract the observer's attention.

Demand: The observer interacted directly with the child through a game for 20 minutes. Through this game, the observer made rules how the SIB occur in orders in this context.

Alone: The child was placed in a room alone without food or leisure items for 20 minutes. The observer then closely watched the child through the camera to

assess how SIB occurs (this is the case of automatic positive and negative reinforcement).

As presented in table 5, out of 21 children participating in the study. Within the four given conditions, every single case went through a test with each condition. Antecedents and consequences for self-injurious behavior were tested. Results showed that 18 children had self-injurious behavior (SIB) in the tangible condition. In this case, the antecedent events that occurred prior to behavior were removing the child's preferred items and the consequence was the child was able to get what they wanted; 3 children engaged in SIB to avoid participating in activities they did not like. In this case, the child

tried to escape from the demands of caregivers. None of the children engaged in SIB when they were alone. Indeed most of the children's SIB were triggered by social interactions.

Results indicated that children's SIB are generated by social interaction. The highest frequency of SIB was tangible (90%), children exhibited SIB when the observer removed their favorite food or preferred items, following frequency of SIB in demand condition (escape) was 15% and attention (15%), lastly no SIB occurred when children were alone. Consequently, socially-mediated SIB accounts for the highest percentage of SIB (Table 5).

Table 5.Frequency of self-injurious behavior in different conditions

	Frequency		Percentage	
	Yes	No	Yes	No
Tangible items	18	3	90	10 %
Escape	3	18	15%	85%
Attention	3	18	15%	85%
Alone	0	20	0%	100%

Functional analysis

In terms of frequency of SIB in each condition, the results of functional analysis (FA) concluded that in the four different conditions (tangible, attention, demand and no interaction), the frequency of SIB to achieve the preferred items is the highest (130 points), followed by escape function (14 points); social attention (2 points) and automatic stimulation (0). Thus, the prevalence of the highest SIB fell into the target to achieve the preferred items/tangible, with an average of 6.5/10

times in 10 trials; attention occurred with an average of 0.7 times (Figure 3).

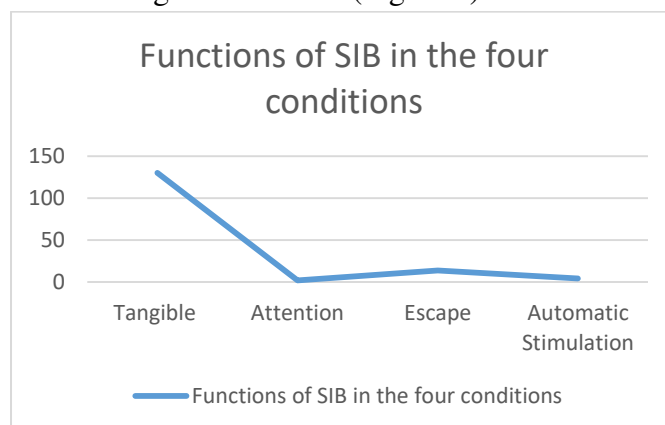


Figure 3. Functional analysis in the four conditions

Comparing the functions of problem behavior identified by FAST-R and the functions identified by FA, the results revealed that although FAST-R categorized social attention and preferred items or tangibles split in the same subscale namely social positive reinforcement, FA results determined the difference between “social attention function” and “tangible function”. The total score of social attention function was only 2 points while the total score of tangible function was 130 points. It means that although, social attention and tangible function are social positive reinforcement or “gain” function, the children in this study were inclined to self-injury to get what they wanted was more dominant. It is also noted that the total score of “attention” function was even less than the total score of “escape” function in FA result.

Discussion

This study mainly explored the self-injurious behavior (SIB) among children with autism in Vietnam. More specifically, the study aimed to investigate the functions of the SIB.

From the descriptive results of the study, the children with autism experienced self-injury behavior and other problem behavior such as aggression, inappropriate verbal and non-verbal, stereotyping and other problem behavior (nail-biting, thing-sucking). This result adds evidence to previous study that showed SIB is common in children with ASD (Pascal, Grisi, & Aussilloux, 2003).

The onset of the SIB before 24 months of age appears as the prominent result of the study. This result confirmed the previous study of the onset of the SIB

before or after 25 months of age (Kurtz et al., 2003; Richman & Lindauer, 2005). In terms of gender, ASD occurs more in boys than it does with girls. This phenomenon is confirmed in other studies (Steinbrenner et al. 2020), which concluded that every 1 child in 54 children has autism. Moreover, for 4 boys with autism, there is 1 girl.

Regarding topographies of SIB, the common topographies are the head suffers more behavior than other positions. This observation confirms previous research (Iwata et al., 1994; Sigafos, cited in Erturk, Machalicek & Christine Drew, 2018), which concluded that common topographies included head-banging or head-hitting, self-biting, eye-poking, hand-mouthing.

The functions of problem behavior were revealed as “gain” function (gain tangible/preferred items), “escape” function (escape from demands) or automatic function (sensory stimulation or pain attenuation). These functions serve as positive social reinforcement or negative social reinforcement or automatic negative-positive reinforcement. Among these functions social-positive reinforcement was found as the prominent function of problem behavior. More specifically, the results of FA determined that functions of self-injurious behavior in children with autism and self-injurious behavior were connected particularly with preferred/tangible items. These results confirmed previous results (Suess et al., 2014; Schlichenmeyer, et al., 2015; Shamlan et al. 2016; Moskowitz, Carr, and Durand, 2011; O'Reilly et al., 2012).

Conclusions

This study found that children with autism experience other problem behaviors aside from self-injurious behavior. This finding invites future researchers to further investigate other problem behavior of children with autism that may contribute to research on autism and problem behavior especially in Vietnam where empirical research is still very limited.

Children with self-injurious behavior displayed stereotypic movements during the early developmental stage. These include hand-waving, hand-shaking, and body-moving in the onset of SIB before 24 months of age. This result implied that stereotypic movements may develop into self-injurious behavior. This finding invites future research to investigate the longitudinal study of the relationship between stereotypic movements and self-injurious behavior.

In most cases, the antecedents of children's self-injurious behavior (SIB) are social interactions, especially social positive reinforcement. It means the SIB occurs to gain what the children want. Indeed, SIB behaviors are not caused by physiological influences but psychological influences. This finding informed rationale and a plan for treatment based on function.

Limitations

This study focused only on self-injurious behavior of children with autism and the functions of the behavior. This study did not investigate the influenced factors of the behavior. The study tested conditions relevant to antecedents and consequences

for self-injurious behavior; however, the test was done just one time for each condition, and the functional analysis should be done in more sessions. Although the study concluded that stereotypic movements may develop into self-injurious behavior, a longitudinal study could tell a better story. The participants of the study were limited to one city in Vietnam.

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