

## Gratification Phenomenon: Clinical Phenotype and Sex Hormones Profile

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### ABSTRACT

**Background:** Self-gratification is characterized by self-stimulation of the genitalia habitually. Childhood masturbation could be described as genital stimulation and touching begins at the age of 2 months, although in certain cases, it may start as early as in-utero. It is of great difficulty to distinguish attacks of masturbation from different medical situations, which include fits, dyskinesia, infantile spasm and abdominal pain.

**Objective:** To demonstrate the clinical and epidemiologic criteria of infant and child with gratification phenomenon and to assess the level of some sex hormones in such patients.

**Methods:** This was case control study that conducted on 25 children diagnosed with self-gratification disorder with control group included 25 children of matched age and gender. Gratification phenomenon diagnosis in our patient was according to descriptive history and review of videotaped events. Laboratory investigation included level of dehydroepiandrosterone sulfate (DHEAS), 17-hydroxyprogesterone (17-OHP) and estradiol.

**Results:** Regarding serum hormone levels, 17-OHP had comparable levels between the cases and control groups. However, both DHEAS and estradiol were significantly decreased in the cases in comparison with the control group. Serum DHEAS had a significant positive correlation with the age of the first attack, while estradiol had a significant negative correlation with attack frequency.

**Conclusion:** Hormonal assay showed significant decline in serum DHEAS and estradiol levels in patients with gratification disorder but with normal levels of 17-OHP, this may indicate the potential role of this hormonal deficiency in pathogenesis of self-gratification phenomena.

**Keywords:** Gratification phenomenon, Masturbation, Dehydroepiandrosterone sulfate, 17-hydroxyprogesterone, Estradiol.

### INTRODUCTION

Self-gratification (Masturbation) in childhood was first described in 1915 by Still, who demonstrated that such behavior was more common compared to formerly thought [1]. It is featured by self-stimulation of the genitalia often accompanied by unusual posture and movement, diaphoresis, flushing, tachypnea, and classically starts in infancy as well as in early childhood [2].

The prevalence of self-gratification in early infancy is not identified as the behavioral features are of great difficulty to be interpreted. Parents' descriptions of the manifestations are sometimes difficult for physicians to interpret as well as for parents to understand. In particular, it is of great difficulty to confirm a diagnosis of masturbation in children below the age of one year [3].

Childhood masturbation could be described as genital stimulation and touching begins at the age of two months, although in certain cases, it may start in utero [4]. One of the main individual features of childhood masturbation is that the behavior occasionally stops if the child becomes distracted, helping to differentiate masturbation from different simulating conditions [5].

The World Health Organization (WHO) doesn't have a special code for childhood masturbation. It is classified under the coding title "Other specified behavioral and emotional disorders with onset usually occurring in childhood and adolescence" in the International Statistical Classification System of

Diseases and Related Health Problems, 10<sup>th</sup> edition [6]. Childhood masturbation isn't comprised in the 5<sup>th</sup> edition of the Diagnostic and Statistical Manual of Mental Disorders [7]. The topic of hyperactive sexuality was suggested but rejected for inclusion in the 5<sup>th</sup> edition by the American Psychiatric Association as it isn't considered an unhealthy behavior [8].

Generally, investigators find it is of great difficulty to distinguish attacks of masturbation from different medical situations, which include epilepsy [9], paroxysmal dystonia or dyskinesia, movement disorders [10], infantile spasm and abdominal pain [11]. There are no preceding records on the natural course of masturbation beginning in early infancy.

Misdiagnosis may lead to unnecessary investigations and use of inappropriate drugs like antiepileptic drugs that lead to further parental anxiety and stress. Preceding records on infants and early childhood masturbation are sparse with no trials to recognize the actual role of sex hormones in such a condition, in spite of the evidence that sex hormones are identified to predispose to adolescent masturbation behavior [12].

In normal infant with self-gratification, the actual mechanism remains unknown in the majority of patients. Despite the documented occurrence of gratification in many literatures, there is deficiency of literature depicting its physical characteristics in our locality. This is attributed to deficient and ignored

parental compliant of these problems due to feeling of guilt related to cultural and religious issues [11-12].

This study was done to demonstrate the clinical and epidemiologic criteria of infant and child with gratification phenomenon and to assess the level of some sex hormones in these patients.

## PATIENTS AND METHODS

This prospective case control study was conducted on 25 children diagnosed with self-gratification disorder attending Neurology Outpatient Clinic in Mansoura University Children Hospital in the period from June 2020 to May 2021. In addition, 25 children of matched age and gender attending the general outpatient clinic for general compliant were selected to act as control group. The value of control group was to compare the level of sex hormones in control group and case group to determine if there is a relation between self-gratification and sex hormone level. Gratification phenomenon diagnosis in our patient was according to descriptive history and review of videotaped events.

This study included children with age between 1 month and 16 years old from both genders, with documented typical events on videotape and with normal or abnormal routine EEG if already performed. But we excluded children with age less than 1 month or more than 16 years old or with systemic, neuropsychiatric, or genetic disorders.

### Methods

Detailed history was taken with stress on perinatal history, nutritional history (type of feeding and time of weaning), socioeconomic status, and features of the attacks that included duration and time of attacks, age of the first attack, frequency of attacks per day, position during attack (knee chest, prone or supine position), attack related to child upsets or need to sleep, and associated symptoms (flushing, sweating and shape after attack). Also, EEG if performed, its result was documented. We also asked about history of antiepileptic drug treatment. Laboratory investigation included level of dehydroepiandrosterone sulfate (DHEAS), 17-hydroxyprogesterone (17-OHP) and estradiol.

### Sample collection

Venous blood sample was collected from both cases and control under complete aseptic condition, delivered into plain tube and left to clot for 20 min. The samples were centrifuged for 10 min at 4000 rpm,

clear non-hemolyzed sera were separated for hormonal assay.

### Test Technique

DHEAS and estradiol were assayed by competitive electro-chemiluminescence immunoassay using **Cobas e-411 analyzer (Roche) (Switzerland)**. 17-hydroxyprogesterone (17-OHP) was assayed using competitive immune enzymatic ELISA method supplied by Dia-Metra (Italy).

### Outcomes

We assessed the relationship between self-gratification and some sex hormone including: Dehydroepiandrosterone sulfate (DHEAS), 17-hydroxyprogesterone (17-OHP) and estradiol.

### Ethical approval:

**Study protocol was approved by Institutional Research Board Faculty of Medicine, Mansoura University. In addition, approval of the managers of the healthcare facilities where the study was conducted, was taken. Informed consent was obtained from all caregivers of all the participants sharing in the study. The Helsinki Declaration was followed throughout the study's conduct.**

### Statistical analysis

Data were analyzed by utilizing the SPSS program V. 24. The normality of data was evaluated by utilizing one-sample Kolmogorov-Smirnov test. Qualitative data were described using number and percent. Continuous variables were presented as mean±SD for normal distribution of data and median (Min-Max) for non-normal data. The following tests were used; Independent t- test, Mann Whitney test, Chi square test, and Fisher exact test, and Spearman correlation. The results were considered significant when  $p \leq 0.05$ .

## RESULTS

Table (1) demonstrates demographic and socioeconomic data in studied groups. Age, gender, socioeconomic status, number of siblings, and Tanner staging showed no significant difference between the two groups. The prevalence of maternal working showed a significant rise in the cases. Regarding serum hormone levels, 17-OHP had comparable levels between the cases and control groups. However, both DHEAS and estradiol showed a significant reduction in the cases compared to the control group.

**Table (1):** Socio-demographic data, Tanner staging and hormonal levels among the studied groups

Socio-demographic data	Cases group (n=25)	Control group (n=25)	Test of significance	P value
<b>Age (years)</b> Median (Min-Max)	3.0 (0.75-10)	4.0 (0.08-10.5)	Z=1.21	0.227
<b>Gender</b> Male Female	5 (20.0%) 20 (80.0%)	9 (36.0%) 16 (64.0%)	$\chi^2=1.59$	0.208
<b>Maternal working</b> Yes No	7 (28.0%) 18 (72.0%)	0 (0%) 25 (100%)	$\chi^2=8.14$	<b>0.004*</b>
<b>Socioeconomic status</b> Low Moderate	4 (16.0%) 21 (84.0%)	3 (12.0%) 22 (88.0%)	FET	1.0
<b>Number of siblings</b> Median (Min-Max)	2 (0-5)	2 (0-5)	Z=1.05	0.293
<b>Tanner staging</b> I II	25 (100%) 0 (0%)	24 (96.0%) 1 (4.0%)	FET	1.0
<b>Hormonal levels</b>				
17- OHP (ng/ml) Median (Min-Max)	0.29 (0.04-8.98)	0.34 (0.11-5.22)	Z=1.08	0.277
DHEAS (ug/dl) Median (Min-Max)	14.2 (1.56-85.5)	58.44 (4.9-179.2)	Z=3.32	0.001*
Estradiol pg/ml Median (Min-Max)	5.00 (3-28.4)	21.60 (5-113)	Z=3.54	$\leq 0.001^*$
Median, Min-Max: non-parametric test. $\chi^2$ : Chi square test, Z: Mann Whitney test, FET: Fischer exact test, *significant $p \leq 0.05$				

Table (2) illustrates perinatal history among cases and control groups. The prevalence of CS-delivery showed a significant increase in the cases group. History of NICU admission was higher in cases group. Although the prevalence of breast feeding was statistically comparable between two groups, the age of weaning was statistically younger in the cases group.

**Table (2):** Perinatal history among cases and control groups

Perinatal history	Cases group (n=25)	Control group (n=25)	Test of significance	P value
<b>Delivery</b> Normal CS	4 (16.0%) 21 (84.0%)	11 (44.0%) 14 (56.0%)	$\chi^2=4.67$	<b>0.031*</b>
<b>Maturity</b> Full term Pre term	23 (92.0%) 2 (8.0%)	23 (92.0%) 2 (8.0%)	FET	1.0
<b>NICU</b> Yes No	5 (20.0%) 20 (80.0%)	2 (8.0%) 23 (92.0%)	FET	0.417
<b>Feeding</b> Breast Artificial	13 (52.0%) 12 (48.0%)	14 (56.0%) 11 (44.0%)	$\chi^2=0.081$	0.777
<b>Age of weaning (months)</b> Mean $\pm$ SD	13.81 $\pm$ 3.77	17.45 $\pm$ 5.37	t=2.54	<b>0.015*</b>
$\chi^2$ : Chi square test, FET: Fischer exact test, Z: Mann Whitney test, *significant $p \leq 0.05$				

Table (3) demonstrates disease characteristics among cases group regarding attack characteristics, most cases had an attack less than 5 minutes (52%). About half of the gratifying children had more than three attacks per day. The parents reported that the attack could occur any time in 13 cases (52%). Most cases started that problem after the age of two years. Additionally, most patients showed the first attack after weaning. The prone position was the most preferred position for gratification. The gratification action had associated symptoms included flushing and sweating.

**Table (3):** Disease characteristics, position of attacks and associated symptoms with gratification among cases group

		Cases group (n=25)
<b>Disease Characteristics</b>		
<b>Attack duration</b>		
<5 min		13 (52.0%)
5-10 min		8 (32.0%)
>10 min		4 (16.0%)
<b>Attack time</b>		
Any time		13 (52.0%)
Before sleep		10 (40.0%)
Child upsets		2 (8.0%)
<b>Attack frequency/day</b>		
1-2		3 (12.0%)
2-3		9 (36.0%)
>3		13 (52.0%)
<b>Age at 1<sup>st</sup> attack (Month)</b>		
Median (Min-Max)		<b>22 (0.25-60)</b>
<12 m		7 (28.0%)
12-24		6 (24.0%)
>24		12 (48.0%)
<b>Relation of 1<sup>st</sup> attack to weening</b>		
Before		7 (28.0%)
With		3 (12.0%)
After		15 (60.0%)
<b>Position of Attacks</b>		
Sitting with extended adducted legs		3 (12.0%)
Prone with extended adducted legs		6 (24.0%)
Prone adducted legs with flexed knee		6 (24.0%)
Any position		4 (16.0%)
Supine with adducted legs extended knees		2 (8.0%)
Lateral position flexed hip and knee with adducted legs		2 (8.0%)
Supine with extended one leg over the other with flexed knees		1 (4.0%)
Sitting with extended one leg over the other with flexed one knee		1 (4.0%)
<b>Associated symptoms</b>		
Flushing and sweating		17 (68.0%)
Flushing		5 (20.0%)
Sweating		3 (12.0%)

There was no significant relationship between age and the position during the gratification behavior (Table 4).

**Table (4):** Relation between position and age

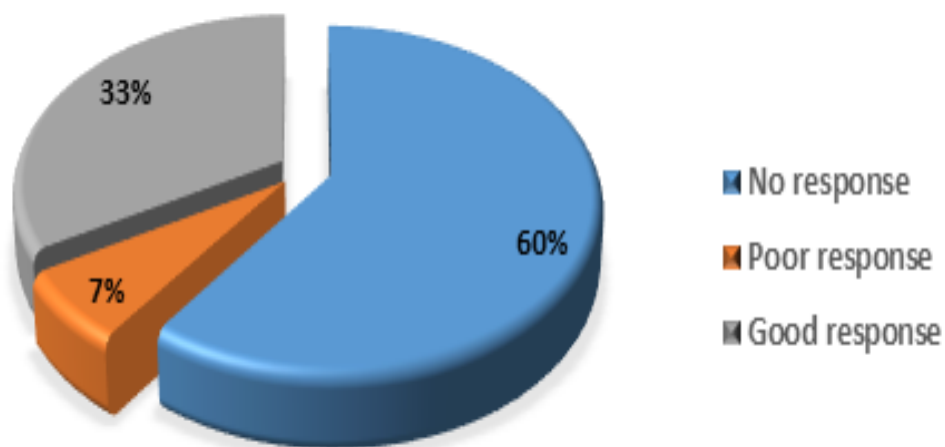
Position	No	Median (Mn-Max) age	P value
Sitting with extended adducted legs	3	5.5 (2-8)	P=0.672
Prone with extended adducted legs	6	4 (1.25-10)	
Prone adducted legs with flexed knee	6	3 (0.75-9)	
Any position	4	2 (2-5)	
Supine with adducted legs extented knees	2	2 (1-3)	
Lateral position flexed hip and knee with adducted legs	2	2 (1-3)	
Supine with extented one leg over the other with flexed knees	1	2	
sitting with extented one leg over the other with flexed one knee	1	5	

Table (5) illustrates investigations among cases. Most investigations were normal, apart from abnormal EEG that was noted in two cases.

**Table (5):** Investigations among cases group

Investigations	Cases group (n=25)
EEG	12 (48.0%)
CT brain	1 (4.0%)
EEG and MRI brain	1 (4.0%)
<b>Result of Investigations</b>	
Normal	12 (48.0%)
Abnormal EEG	2 (8.0%)

Figure (1) demonstrates treatment response among cases group. Treatment was used for 15 patients only. No response was detected in most cases (60%). Table (6) shows that drugs were commenced for 15 patients (60%). No significance was detected between the treatment commenced and response.



**Figure (1):** Response among cases group.

**Table (6):** Treatment response in studied cases

	Duration of treatment (month)	No	No response	Poor response	Good response	P value
<b>Drugs</b>	1.0 (0.33-24)	15	9 (60.0%)	1 (6.7%)	5 (33.3%)	
<b>Valproic acid</b>	1.5 (1-6)	4	3 (75.0%)	1 (25.0%)	0 (0%)	0.069
<b>Oxcarbazepine</b>	4 (2-4)	3	2 (66.7%)	0 (0%)	1 (33.3%)	1.0
<b>Clonazepam</b>	0.87 (0.75-1)	2	1 (50%)	0 (0%)	1 (50%)	1.0
<b>Resperidone</b>	1 (0.5-6)	5	2 (40.0%)	1 (20.0%)	2 (40.0%)	0.372
<b>Levetiracetam</b>	2.5 (0.5-24)	4	2 (50%)	0 (0%)	2 (50%)	0.692
<b>Cerebrolysin</b>	1 month	1	0 (0%)	0 (0%)	1 (100%)	0.401
<b>Citicoline</b>	0.33 (0.33-0.33)	2	2 (100%)	0 (0%)	0 (0%)	0.569

Table (7) illustrates correlation between hormonal level and disease characteristics. Serum 17-OHP didn't correlate with either attack duration, frequency, or the age of the first attack. However, serum DHEAs had a significant positive correlation with the age of the first attack, while estradiol had a significant negative correlation with attack frequency.

**Table (7):** Correlation between hormonal level and disease characteristics

	17- OHP ng/ml		DHEAS ug/dl		Estradiol pg/ml	
	r	p	r	p	r	p
<b>Attack duration</b>	-0.124	0.556	-0.033	0.875	0.034	0.871
<b>Attack frequency /day</b>	-0.218	0.294	-0.386	0.057	<b>-0.421</b>	<b>0.036*</b>
<b>Age at 1st attack</b>	-0.128	0.544	<b>0.549</b>	<b>0.005*</b>	-0.066	0.753

## DISCUSSION

Masturbation is a typical sexual performance that affects 90-94% of males and 50-60% of girls at some time in their life. Masturbatory activities in children and newborns, on the other hand, are a less widely addressed subject in the literature, with most conclusions based on incidents or case studies. It is difficult to determine the cause due to a range of manifestations that can be mistaken as additional health issues, in addition to the shortage of usual sexual manipulation in this age range [13].

Although the fact that sex factors are believed to predispose to juvenile or adult masturbation behavior, previous studies on infants as well as initial children masturbation are scarce, with no attempts to define the significance of sex factors in such a circumstance [12, 14]. The median age of our included children in this study was three years in the cases group and four years in the control group, with no significant differences between the two groups. In line with our findings, a prior study found that the average age of children who masturbated was 40 months. The majority of the participants were older than two years, with an average age of 3.5 years [13]. In addition, the research group's distribution of ages matches those of earlier investigations [12,15].

This may be caused by the fact that children between the ages of 3 and 4 begin to explore their bodies and discover that being touched of the genitalia offers a nice sensation, therefore the highest point of this condition at this age range. They may carry on with this experience throughout their lives.

The majority of those enrolled in the present research were girls, who made up 80% of the research's patient population. This is consistent with **Unal's** finding that 67.2% of patients in the adolescent masturbation category were females [14]. The same findings were reported by **Deda et al.** [16] and **Hansen and Balslev** [17]. Furthermore, other older research found that girls were more likely than boys to have the same condition [18-21].

Our study showed a significant increase in the prevalence of working mothers in the cases group. Maternal working may be associated with less care for the children. This conclusion can be explained through the fact that the mother's work affects child care time, resulting in emotional deprivation, which may lead to self-stimulation as compressed behavior. Maternal employment may form a sort of familial stress, which positively correlate with childhood masturbation and self-gratification behavior [22].

In the current study, no significant difference was noted between the cases and control group regarding their family's socioeconomic status, which was moderate in 84% and 88% of subjects in the two groups, respectively. In agreement with our findings, **Unal** observed that family type and economic level were statistically unimportant when comparing

patients and controls [14], which agrees with our findings. **Rahman et al.** [23] discovered that the majority of patients (46% and 50%, respectively) belonged to the medium and upper income groups in their study. However, **Dhafer et al.** [24] discovered that masturbatory behaviour was more widespread in lower socioeconomic classes (68%).

In the current investigation, we found no statistically significant variations in 17-OHP levels between patients and controls, with median values of 0.29 and 0.34 ng/ml in the two categories, respectively. In the same context, another study found that the identical value had mean levels of 2.55 and 2.83 nmol/l in cases and controls, accordingly, with no statistically significant difference ( $p = 0.75$ ) [12].

Our findings showed a significant decline in serum DHEAS levels in cases compared to controls (14.2 vs. 58.44 ug/dl respectively,  $p = 0.001$ ). The same hormone had a significant positive correlation with the age of the first attack ( $r = 0.549$ ,  $p = 0.005$ ). According to **Ajlouni et al.** [12], DHEAS showed mean values of 4.37 and 6.59 ug/dl in the experimental and control groups, respectively. Although DHEAS levels were lower in cases similar to our results, the difference was statistically insignificant ( $p = 0.54$ ). There was a substantial decrease in serum estradiol levels in conjunction with self-gratification ( $p 0.001$ ) in the current investigation, with median values of 5 and 21.6 pg/ml in the patients and control groups, respectively. The same hormone was also found to have a significant negative link with attack frequency. This suggested that estradiol insufficiency may play a role in the etiology of satisfaction disorder. **Ajlouni et al.** [12] validated this, reporting that the same protein had a mean value of 12.31 pg/ml in the cases group, compared to 19.46 pg/ml in the control group, with a statistically significant difference ( $p = 0.03$ ). The authors did not provide a justification for their results, but they did request that their findings be interpreted with caution.

In the current study, the prevalence of children delivered by CS increased significantly in the cases group compared to control (84% vs. 56% respectively,  $p = 0.031$ ). The health concerns related with CS in children are well recognized. According to existing evaluations and meta-analyses, CS is linked with a higher possibility of inflammatory bowel disease, asthma and respiratory disorders, allergies, childhood-onset type I diabetes mellitus (DM), immune system dysfunction, atopic diseases, and obesity [25].

The impacts on children's mental growth and actions are less well understood, while there is accumulating evidence that CS may influence child neurodevelopment via altered hypothalamic-pituitary-adrenal axis regulation [26], colonization of the gut microbiota is delayed and changed [27], epigenetic changes [28] or altered maternal behaviors [29].

In the present study, the age of weaning was significantly younger in cases compared to controls (13.81 vs. 17.45 months, respectively). These findings highlight the significance of physical contact and emotional support. Nursing not only offers sustenance, but also sensory and emotional enhancement. When this is combined with the knowledge that reducing the mother's time spent with her child may cause additional irritation, it is reasonable to believe that self-gratification is associated with the loss of this reassuring touch. It was previously observed that when a correlation grew unsatisfactory, children began to overstimulate themselves [21].

A prior study in the same context found that the length of breast-feeding in the infant's masturbation group was significantly lower than in the control group (8.7 vs. 12.1 months, respectively,  $p < 0.05$ ) [14]. Furthermore, Askari *et al.* [30] found that the duration of breast feeding was significantly longer in the non-masturbating group ( $p = 0.035$ ).

In the present research, approximately half of the cases (52%) had their initial attack before the age of two years, while the remaining 48% got it after that age. In a study showed by Unal [14]. In numerous instances, self-gratification began before the age of two. The smallest case in our study was a one-month-old infant [31]. Bradley described two 5-month-old children [18]. These findings revealed that attention in the genital area occurs sooner than predicted, particularly in children who have an interfering issue such as trouble starting or keeping sleep or genital itching.

In the current study, the majority of children had < 5-minute attack, with 32% having a length between 5 and 10 minutes. The remaining children were attacked for more than ten minutes. In terms of attack frequency, 52% of our cases experienced more than three attacks each day, while the rest instances had lower frequencies. Fleisher and Morrison [19] observed that the rate of an occurrence ranged from one/week to 12/day, with a mean rate of 16/week and a median of 7/week. The incident lasted an average of nine minutes (median 2.5 minutes, range 30 seconds to two hours).

Furthermore, Ajlouni *et al.* [12] revealed that the typical number of incidents in their study was four per day, with a median length of 3.9 minutes. According to Rahaman *et al.* [23] the majority of episodes (48%) lasted 3-5 minutes, subsequently followed by less than 3 minutes (28%) and happened 3-5 times per day (66%).

In the present study, over half of the identified cases (52%) had the attack at any time, whereas some (40% had it before going to sleep). Only 8% of the patients had the attacks with disturbances. In a prior study, the majority of the children (78.7%,  $n = 48$ ) masturbated during the day. However, there were also children (21.3%,  $n = 13$ ) who masturbated exclusively while falling asleep at night [14].

According to Izadi-Mazidi and Riahi [32], 33.84% children masturbate a majority of the time, whereas the same problem happened before bedtime or while the child was alone in 12.3% and 15.38% of cases, respectively. Due to their parents' knowledge, the remaining 38.46% of cases did not have a specific time. In addition, Dhaher *et al.* [24] reported that the event occurred at any time in 35 (80%) of the children and only at night in nine (20%) of the children.

In our study, the prone position was the most preferred position for gratification, as it was reported by 48% of cases. Masturbation was predominantly undertaken in the prone and lateral decubitus positions for children as well as for babies, according to Doust *et al.* [13]. Furthermore, Rahman *et al.* [23] showed that most of children (78%) performed the activity in the prone position, followed by the lying down supine posture (18%).

In terms of the treatment that began in our study, 15 patients (60%) received predominantly antiepileptic medicines. Rahman *et al.* [23] showed that 32% of cases received therapy with anti-epileptic medicines such as phenobarbitone (88%) and sodium valproate (12%), with no significant difference in these instances. This is consistent with our findings about the poor effectiveness of pharmaceuticals in children with self-gratification (60% no response and 6.7% bad response).

Our findings were also consistent with a prior case report that described a five-year-old child with self-gratification who was started on two drugs. Despite treatment for more than a year, the girl would perform masturbation in episodes, indicating a poor reaction to these treatments, according to her mother's description [33]. There is no well-designed clinical trial in the literature that investigates acceptable treatment techniques for children gratification habits. A few existing research have looked into how to handle self-gratification tendencies [22]. Patients with gratification behaviors may benefit from behavioral therapy and drugs, which include escitalopram and aripiprazole [34].

The prior findings could indicate that the disorder's management is difficult and poorly defined. As a result, more prospective trials evaluating different treatment regimens are needed to determine which is best for such patients. In the current investigation, our statistical analysis revealed no significant predictors of treatment response. This could be due to the complexity of disease management, as well as the small sample size (insufficient for significant data). That goal was rarely addressed in the current research, and more trials with more cases should be undertaken to find non-responders early and explore different treatment options for them.

## CONCLUSION

Gratification disorder in children and infants is common situation, occurrence of a such condition is not an age dependent process, although it occurs most

commonly within the third year of age, middle socioeconomic standards with absent and working mother is a common finding in such condition. Careful observation of the child is the corner stone for diagnosing this disorder, medical treatment for gratification disorder is not that efficient control the condition. Hormonal assay showed significant decline in serum DHEAS and estradiol levels in patients with gratification disorder but with normal levels of 17-OHP, this may indicate the potential role of this hormonal deficiency in pathogenesis of self gratification phenomena. Further studies are required to confirm this finding.

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