

Changes in Parents' and Self-Reports of Behavioral Problems in Brazilian Adolescents after Behavioral Treatment with Urine Alarm for Nocturnal Enuresis

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ABSTRACT

Purpose: Compare parents' reports of youth problems (PRYP) with adolescent problems self-reports (APSR) pre/post behavioral treatment of nocturnal enuresis (NE) based on the use of a urine alarm.

Materials and Methods: Adolescents (N = 19) with mono-symptomatic (primary or secondary) nocturnal enuresis group treatment for 40 weeks. Discharge criterion was established as 8 weeks with consecutive dry nights. PRYP and APSR were scored by the Child Behavior Checklist (CBCL) and Youth Self-Report (YSR).

Results: Pre-treatment data: 1) Higher number of clinical cases based on parent report than on self-report for Internalizing Problems (IP) (13/19 vs. 4/19), Externalizing Problems (EP) (7/19 vs. 5/19) and Total Problem (TP) (11/19 vs. 5/19); 2) Mean PRYP scores for IP (60.8) and TP (61) were within the deviant range (T score ≥ 60); while mean PRYP scores for EP (57.4) and mean APSR scores (IP = 52.4, EP = 49.5, TP = 52.4) were within the normal range. Difference between PRYP' and APSR' scores was significant. Post treatment data: 1) Discharge for majority of the participants (16/19); 2) Reduction in the number of clinical cases on parental evaluation: 9/19 adolescents remained within clinical range for IP, 2/19 for EP, and 7/19 for TP. 3) All post-treatment mean scores were within the normal range; the difference between pre and post evaluation scores was significant for PRYP.

Conclusions: The behavioral treatment based on the use of urine alarm is effective for adolescents with mono-symptomatic (primary and secondary) nocturnal enuresis. The study favors the hypothesis that enuresis is a cause, not a consequence, of other behavioral problems.

Key words: *nocturnal enuresis; adolescent; evaluation studies; treatment outcome*

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INTRODUCTION

Nocturnal enuresis (NE) is a common problem in childhood. Epidemiological studies show that 15-22% of boys and 7-15% of girls at seven years of age are bedwetters (1). These percentages lower to 1-2% among adolescents and young adults (1,2). Facing this problem the family must make a decision: wait for spontaneous remission - approximately 15% of the enuretics stop wetting the bed each year (2-4) - or seek

aid to solve the problem. The negative impact of NE on both the adolescent and the family (5-8) suggests that the second option should be chosen.

Although some children do not demonstrate negative psychological consequences of NE, the majority usually disclose distressing repercussions of being a bedwetter (1,8). The wet bed changes the daily routine, which bothers mainly younger children; for older children, enuresis becomes a humiliation. Adolescents with NE feel guilty and ashamed, they

avoid social activities, and they feel different from the others (9). This indicates that older enuretics suffer more negative psychological consequences of NE.

Several researchers have studied the relationship between enuresis and psychological problems. A 15 year longitudinal study with New Zealand children investigated the relationship between nocturnal enuresis and measures of behavioral adjustment in adolescence (10). Patterns of nocturnal bladder control were evaluated once a year (from 2 to 15 years old), and psychological measures were collected at ages 11, 13 and 15. Results have shown that children who continued to wet the bed after the age of 10 as a result of either primary or secondary enuresis had more behavioral problems and attention deficit up to the age of 13, and more internalizing problems up to the age of 15 (10).

A review of the literature (11) suggests that bedwetting causes other behavioral problems, rather than the other way around. The relationship between NE and behavioral problems seems to be stronger in older enuretics, although cause and effect still have not been established (11). A study developed in China, using the Child Behavior Checklist (CBCL) as the psychological measure, showed that the later the children achieved the urine control, the higher the probabilities of parents reporting behavioral, emotional and academic problems (12).

Although the literature concerning enuresis and behavior problems is vast, the results must be accepted with caution. The criteria used to consider a child as being enuretic are usually different from one study to another, and the methodological design of studies does not always allow firm conclusions to be drawn (13,14). In addition, most studies focus on externalizing problems evaluated from only one point of view (parental evaluation of their children's behavior), thereby ignoring the internalizing problems and adolescents' self-reports.

In one of the first studies that specifically investigated internalizing problems in children with enuresis, no differences were found between self-reports of bedwetters and a control group of children without enuresis (15). However, the parents' reports of the children's behavior were different across the two groups. Parents of enuretics tended to indicate their children as having more internalizing problems

("withdrawn" and "anxious/depressive") than compared controls (15).

The importance of having multiple informants when evaluating children's behavioral problems has been emphasized by the previous researchers (15). These authors observed that overall agreement between children and parent reports was low to moderate, whereas parent-child agreement in a sample of enuretic children was moderate to good (15). Despite the fact that the information source seems to influence the severity of reported problems, clinical work and scientific studies have emphasized the necessity of including multiple informants in the diagnostic evaluation of children and adolescents (16). Apparently when parents evaluate their children, more externalizing problems are reported, while children, on self-report, point out more internalizing problems. Even though there is consensus that is important to have multiple informants during child/adolescents' assessment, the literature still has not reached a consensus on how to interpret the differences found in both reports (16).

The effects that treating enuresis has on other behavioral problems have been investigated in only a few studies. The first randomized, controlled study examining if there were changes in behavioral problems after six months of enuresis treatment with a urine alarm, desmopressin acetate or placebo found significant changes on CBCL scores for Internalizing Problems, Externalizing Problems, Social Problems, Thought Problems and Attention Problems (17). These changes occurred independently of the treatments' result and the kind of treatment offered, including placebo condition. These authors suggested that the attention, support, and reassurance inherent in participation in the study were beneficial for all children (17).

Some researchers from the Netherlands also attempted to investigate the effects of enuresis treatment on other behavioral problems (18). A reduction in mean scores on the CBCL occurred six months after treatment in the group of children who achieved success on controlling bedwetting. The most significant differences were found in mean scores on internalizing problem scales, specifically in the scale of anxiety/depression. The observed reduction on other behavior problems after a successful enuresis

treatment suggests that the other behavioral problems were a consequence of the bedwetting, not the cause of this bio behavioral problem. This hypothesis has been supported by several studies (11,15,18).

Apparently, enuresis treatment has the effect of reducing the frequency, and/or the intensity, of other behavioral problems, although there is no consensus whether it is necessary to achieve success in the enuresis treatment to obtain the reductions. Considering the fact that there are few studies that analyze general behavioral changes after treatment for nocturnal enuresis, and that it is important to have multiple informants in the assessment of child and adolescents problems, the present study was designed to compare parents' reports on youth problems (PRYP) with adolescent problems self-reports (APSR) before and after a behavioral treatment based on the use of urine alarm for nocturnal enuresis. We hypothesized that, since enuresis seems to be a cause of other behavioral problems, adolescents' self-report and parents' reports would indicate a reduction on behavioral and emotional problems following treatment for NE.

MATERIALS AND METHODS

A total of 19 youths - 13 boys and 6 girls - (age ranging from 11 to 16, average 12.32 years, SD = 1.83 years) participated in this study. The psychologist used a screening interview to evaluate the type of bedwetting presented by participants. All participants met the criteria for mono-symptomatic nocturnal enuresis established by the International Children's Continence Society (19): involuntary voiding of urine during sleep in children without other lower urinary tract symptoms and without history of bladder dysfunction. Most adolescents (16/19) had primary nocturnal enuresis; although three (two boys and one girl) were diagnosed with secondary enuresis, since they had been dry for a period of six months or more, and then started bed wetting again. The majority (15/19) had previously undergone pharmacological treatment, but had not ceased wetting the bed. The number of wet nights before treatment ranged from 2 to 7 wet nights per week (average 5.42 wet nights per week, SD = 1.84).

To evaluate behavioral problems in young adolescents, the rating from the Achenbach System of Empirically Based Assessment (ASEBA) was chosen. This system is used worldwide in different contexts, including medical clinics, psychological clinics, and in research (20). Moreover, the ASEBA is the most widely used and researched system of its kind, with some 6,000 publications reporting findings in 67 different cultures (20). Since several researchers in the enuresis field have used the ASEBA to evaluate behavioral problems, it was chosen to assess the parent's reports on youth's problems (PRYP) and the adolescent's problems self-reports (APSR) in the current study.

The parents completed the "Child Behavior Checklist for ages 4 to 18" (CBCL/4-18) (21), which yield three broadband scales of Internalizing (IP), Externalizing (EP) and Total Problems (TP). T-scores of 60 or higher were considered to be deviant consistent with the questionnaires of authors who suggest combining the clinical range and the borderline range to establish deviance.

In addition, the participants completed the "Youth Self-Report" (YSR) (22). This self-report questionnaire has problem items generally parallel to those of the CBCL. The scores derived and the deviance cut points are similar to those for the CBCL.

After this first evaluation process (pre attendance assessment), the treatment was started. Parents and participants had to agree that while they were involved in this treatment, they could not receive any other treatment. The behavioral treatment based on the use of urine alarm was chosen either due to the high success rate and low relapse rate reported for this device in the literature, or to the low costs involved (2). The adolescent, the family, and the psychologist worked together to achieve dry nights, since behavioral treatment for bedwetting requires concerted and cooperative effort from the entire family (2). The treatment, based on the program proposed by Arthur C. Houts (2), involved attending weekly sessions of behavioral treatment, which focused on several procedures well described by Blackwell (23), such as: explaining the nature of enuresis, following treatment instructions for use of the urine alarm, cleanliness training, retention control training, solving daily problems, recording dry/wet nights and control

of drinking diuretic beverage before bedtime (23). After achieving 14 consecutive dry nights we added the over learning procedure (2).

Eight weeks without wet nights were considered for discharge.

The treatment was planned to last 40 weeks. After that period, regardless of the achieved NE result, parents and adolescents were asked to complete the questionnaires (CBCL and YSR, respectively) a second time (post treatment assessment).

Approval by University Ethics Committee was obtained, and a formal written consent was signed by the participants. All questionnaires were scored using the software ADM (Assessment Data Manager) (24), developed by Achenbach et al. for this purpose. Statistic analyses were done using the software SPSS 13.0 for Windows.

RESULTS

Enuresis Control

All participants achieved at least 2 weeks with consecutive dry nights, and the majority (16/19)

remained dry for 8 consecutive weeks and were discharged.

Behavioral Problems

Figure-1 shows the proportion of cases in the deviant range before and after treatment as scored by parents and youths.

Although more adolescents achieved the deviant range on parent's report (13/19 on IP, 7/19 on EP, and 11/19 on TP) than on youths' self-report (4/19 on IP, 5/19 on EP, and 5/19 on TP), no statistical difference was found between observers in the number of clinical cases for IP ($\chi^2(1, N = 19) = 0.101, p = 0.750$), EP ($\chi^2(1, N = 19) = 0.827, p = 0.363$), and TP ($\chi^2(1, N = 19) = 1.360, p = 0.243$) before treatment. The number of participants scoring within the deviant range on CBCL and the YSR decreased on post-treatment rates, but were still higher according to parent's reports on IP (9/19), EP (2/19), and TP (7/19) than adolescents' reports on IP (4/19), EP (1/19), and TP (3/19). Chi-square tests were used to determine if the difference in number of clinical cases was significant after treatment. No statistical difference between

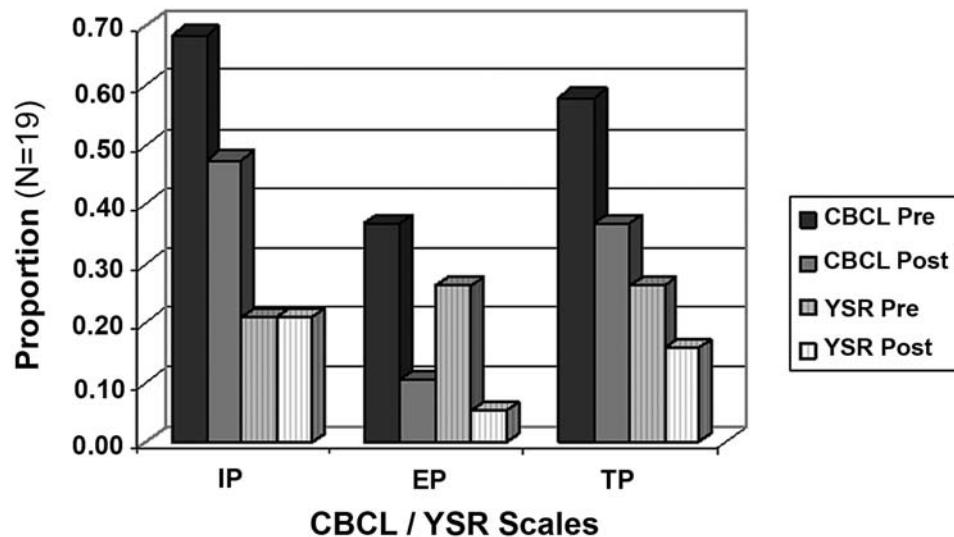


Figure 1 – Proportion of adolescents within clinical range (pre and post treatment data) according to parents' reports on CBCL and to youths' reports on YSR. IP = Internalizing Problems Scale; EP = Externalizing Problems Scale; TP = Total Problems Scale.

observer was found for IP ($\chi^2(1, N = 19) = 0.281, p = 0.596$), EP ($\chi^2(1, N = 19) = 0.124, p = 0.725$), and TP ($\chi^2(1, N = 19) = 2.078, p = 0.149$).

Average T Score Evaluation

Figure-2 shows the average T score obtained by participants (pre/post treatment data).

ANOVA with repeated measures was used to compare the mean T scores obtained with the CBCL and the YSR. Before treatment, the mean score obtained from parents report (CBCL) was significantly higher than the mean score obtained for youths' self-report (YSR) for IP (Wilks' $\lambda = 0.658, F(1,18) = 9.340, p = 0.007$), EP (Wilks' $\lambda = 0.730, F(1,18) = 6.662, p = 0.019$), and TP (Wilks' $\lambda = 0.549, F(1,18) = 14.774, p = 0.001$). Mean CBCL IP and TP scores were in the deviant range (T score ≥ 60), whereas mean CBCL EP score, and mean YSR scores were within the normal range (T score < 60).

After treatment, CBCL scores were still significantly higher than YSR scores for IP (Wilks' $\lambda = 0.632, F(1,18) = 10.472, p = 0.005$), EP (Wilks' $\lambda = 0.742, F(1,18) = 6.257, p = 0.022$), and TP (Wilks' $\lambda = 0.619, F(1,18) = 11.1, p = 0.004$), although both CBCL and YSR scores were below the deviant range (T score < 60).

Single ANOVA with repeated measures was used to investigate the differences between parents' reports (PRYP) on youth's problems before and after treatment, and adolescents' problems self-report (APSR) before and after treatment. Results are shown on Table-1.

Table-1 shows that mean CBCL IP, EP and TP scores after treatment were significantly lower than pre-treatment scores, which indicates that parents reported fewer problems after their children had gone through behavioral treatment based on the use of urine alarm. No significant differences were found on the youths' report when pre-treatment and post-treatment scores were compared.

COMMENTS

Treatment with a urine alarm is the most frequently adopted behavioral intervention for bed-

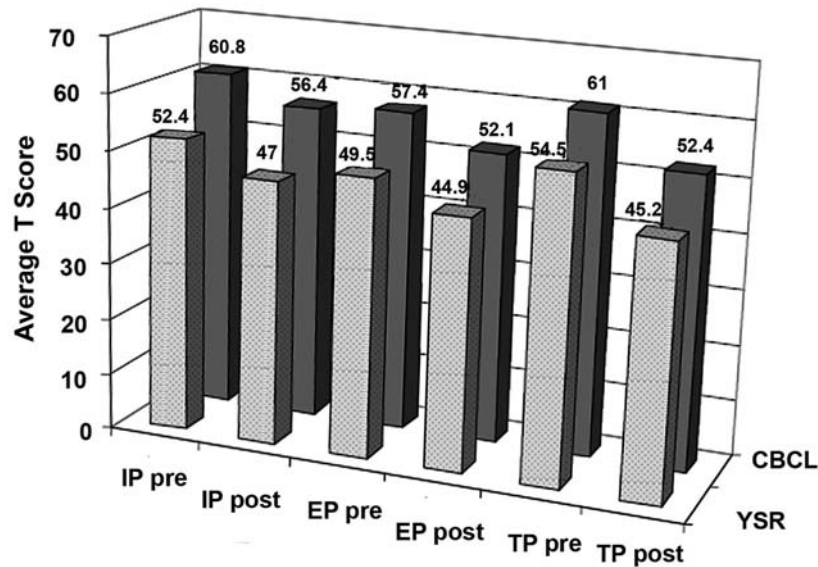


Figure 2 – Adolescent average T scores obtained by parental (CBCL) and self (YSR) reports; pre and post treatment data. IP = Internalizing Problems Scale; EP = Externalizing Problems Scale; TP = Total Problems Scale.

Table 1 – Differences between evaluation data pre and post treatment.

Pair		Single ANOVA with Repeated Measures
CBCL - Parents' reports	IP Pre vs. IP Post	Wilks' $\lambda = 0.791$, $F(1,18) = 4.758$, $p = 0.043^*$
	EP Pre vs. EP Post	Wilks' $\lambda = 0.789$, $F(1,18) = 4.826$, $p = 0.041^*$
	TP Pre vs. TP Post	Wilks' $\lambda = 0.743$, $F(1,18) = 6.234$, $p = 0.022^*$
YSR - Youth's reports	IP Pre vs. IP Post	Wilks' $\lambda = 0.847$, $F(1,18) = 3.254$, $p = 0.088$
	EP Pre vs. EP Post	Wilks' $\lambda = 0.822$, $F(1,18) = 3.893$, $p = 0.064$
	TP Pre vs. TP Post	Wilks' $\lambda = 0.869$, $F(1,18) = 2.719$, $p = 0.117$

* $p \leq 0.05$. IP = internalizing problems; EP = externalizing problems; TP = total problems.

wetting (2,5,25) and has shown high efficacy. The success rate reached in our study (84.21%) is superior to the success rate found in the enuresis literature, which is 60% to 70% of the cases (25). However, the comparison between studies is very difficult, since the literature has reported different inclusion criteria and success criteria (13,14). If we considered 14 consecutive dry nights, the most widely used success criterion found in the literature (14), we would have achieved 100% success. It is likely that the treatment offered (behavioral treatment based on the use of urine alarm) is a factor that helped to achieve our high rate of success. Most treatments with urine alarm do not have a weekly session to monitor the alarm use. The psychologist motivated and helped the parents and the adolescents to accurately follow the procedure - which is very important to achieve success using the urine alarm -, and used social positive reinforcement as a consequence for all appropriate behaviors. In addition, the other procedures that were followed during the use of the urine alarm may have also interfered in the final result, although more data is needed to sustain this statement. The over learning procedure and the criteria for discharge of 8 consecutive weeks with dry nights might have reduced the relapse rate, but only follow up studies can confirm this hypothesis.

Among the vast literature regarding behavior problems and nocturnal enuresis, there are few reported studies focusing on internalizing problem changes after enuresis treatment, and fewer studies using both adolescents' and parents' reports. The present study addresses this gap in the literature. The results indicate that enuretic adolescents, even

before treatment, did not report scores in the deviant range on YSR Internalizing Problems, Externalizing Problems and Total Problems scales. Parents' reports were significantly different from youth's self-reports: parents judged their enuretic children to be within the deviant range for Internalizing and Total Problems before treatment. These data are similar to those reported in a Belgian study (15): the children who participated in the Belgian study did not report more internalizing problems than control children did. However, parents' reports on the CBCL indicated that enuretic children have higher anxious/depressed and withdrawn scores than control children. Both Brazilian and Belgian results indicate that parents are more likely to evaluate their children as having other behavioral problems (besides enuresis) than bedwetting.

One explanation for the differences found between parents' reports and adolescents' self-reports might be that adolescents do not want to disclose everything, or that they try to deny the problems they are facing (16). Another explanation could be that parents evaluated their children as worst than they really were, imagining that this was the way to obtain treatment. It is also possible that, as the enuresis problem seems to make parents pay more attention on their children, they could also perceive their children's behavioral problems greater or more frequent than other parents who are not so focused on their children. We cannot forget that adolescence is a "gap period" when conflicts between parents and their children increase, and differences in their perceptions on several topics are very common. It is also important to note that par-

ent-adolescent agreement on the CBCL-YSR in the U.S. normative sample was only 0.29 (26). This low agreement level has repeatedly been documented in studies that compare parents' reports and adolescent self-reports (16).

Even though the literature reports that on parental evaluation, adolescents achieve higher scores on externalizing problems, and on self-report, they indicate more internalizing problems (16), we did not find results indicating that type of difference. In fact, parents reported more internalizing problems than externalizing problems when they evaluated their youths.

Although there was a visible decrease in the mean score of the YSR IP, EP and TP following treatment, the difference was not significant. At both time points, mean YSR scores were in the normal range, indicating that enuretic adolescent did not evaluate themselves as having other behavioral problems, besides enuresis.

Similar to the results found in Canada (17), we found declines in CBCL IP, EP and TP scores post behavioral treatment based on the use of urine alarm for nocturnal enuresis. Results in the same direction were also found in the Netherlands (18). In the Dutch study, children who overcame enuresis seemed to have less internal distress, fewer problems with other people, and were less anxious and/or depressed after treatment based on parents' reports using the CBCL.

It is likely that the information and support offered during treatment were beneficial to the participants. All adolescents showed significant declines in bedwetting, even though the decline in YSR scores was not significant. This was probably because YSR scores were relatively low before treatment began. It is also possible that parents' satisfaction with the achieved control of NE as a result of treatment led them to view their adolescents more favorably on the CBCL. In future research, it will be important to determine if the treatment gains in NE and CBCL scores persisted after one year. Our data provide additional support for the hypothesis that behavioral/emotional problems are often a consequence of bedwetting rather than cause of enuresis (e.g. 11,15,18).

One limitation of the present study is the small number of participants, which resulted in low power to detect effects. Our study certainly would have been

enhanced if we had had a larger number of participants. In addition, the use of rating scales rather than diagnostic assessments was a further limitation. A no-treatment control group would also have contributed to our study. This would have allowed comparison between behavioral changes in enuretic adolescents who had had treatment access versus those who did not receive treatment. Based on our data, we cannot answer the question about whether it is necessary to achieve success in enuresis treatment to have changes on other behavioral problems, since virtually all our participants achieved control over bedwetting (at least 14 dry nights). This study was not able to replicate the study performed in the Netherlands (18) that compared behavioral changes that occurred in the group that achieved success and the group that did not achieve success with the enuresis treatment because in our study all participants achieved at least two consecutive weeks with dry nights, the most widely used success criterion (14).

CONCLUSION

The behavioral treatment based on the use of urine alarm for enuresis was effective for ceasing bedwetting in adolescents with mono-symptomatic (primary and secondary) nocturnal enuresis. Since this treatment also seems to produce a positive effect on other behavioral problems, or on the parental report of these behavioral problems, it is important to advise parents to seek treatment for NE for their adolescents. The hypothesis that enuresis is a cause, not a consequence of other behavioral problems, was supported by our data.

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CONFLICT OF INTEREST

None declared.

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EDITORIAL COMMENT

Many studies focus on the relationship between enuresis and psychological problems/psychopathology. However, most of these studies have a cross-sectional design, which makes deductions about causality very difficult. The current study makes an important contribution to this field of research since it consists of two time measurements: before and after treatment. This study design enables the authors and readers to deduct some well-founded hypotheses on causality. Nevertheless, I believe the manuscript could benefit considerably from the following comments.

An important limitation for this study is also the small sample size (from a statistical point of view). Also, whether alarm treatment is effective depends heavily on the etiology of enuresis. The current statement is not a general conclusion from this study.

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EDITORIAL COMMENT

This is an uncontrolled clinical study examining the effect of successful enuresis alarm treatment on psychological functioning (through parental and self-perception) with a small sample (n=22) of adolescents with nocturnal enuresis.

The paper specifically seeks to explore both the difference in opinion between parent and youngster with respect to behavior; and an analysis of change in psychological functioning before and after treatment with the enuresis alarm.

The paper is very clear and highlights the importance of understanding behavior from both the parent and protagonist's perspective. I also like how the authors have defined mono-symptomatic nocturnal enuresis. In all I think the paper would be a welcome addition to the literature.

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