Children's deviant behavior in primary education:

Comparing Physical educator's aspects with diagnostic criteria

Abstract

Objective: The study aimed to investigate physical educators' aspects of children's emotional and behavioral problems in primary education.

Method: Sixty physical educators were asked to enlist the deviant motor related behaviors they observe during physical education lessons in typical elementary school settings. In addition, a team of experts was asked to select from DSM-IV (APA, 2000) and ICD-10 (WHO, 1992) a number of official diagnostic criteria describing children's motor behaviors and to group them together with the physical educators' reports into categories based on their perceived similarity in content.

Results: A hierarchical cluster analysis suggested that physical educators focus more on externalizing motor related behavior, including disobedience and aggressiveness when internalizing behavior, such as anxiety and low energy were less reported.

Conclusions: There was a great degree of correspondence between the physical education teachers' aspects of children's problematic behavior and the official diagnostic criteria on children's psychopathology. Physical educators were able to provide important and accurate information for detecting children at risk for emotional and behavioral problems in school settings. The importance of physical education teachers' aspects on their teaching efficacy and practical implications of the results are discussed.

Keywords: children, emotional and behavioral disorders, physical education, diagnostic criteria, cluster analysis

Physical educators' aspects of children's deviant behavior in primary education

1.Introduction

1.1 *Children at risk*

Detection efforts for students at risk for emotional and behavioral disorders are particularly critical during the early educational years, when these children are most amenable to change in behavioral, social, and academic arenas and before experience negative outcomes within and beyond the school setting (Landrum, Tankersley, & Kauffman, 2003; Lane, 2003; Volkmar, Lord, Bailey, Schultz, & Klin, 2004). Accurate early identification and assessment-driven treatment is essential in view of the risk for later delinquency and the high societal costs associated with undetected and untreated disorders (McMahon & Frick, 2005).

Although studies suggesting that approximately 20 percent of individuals in late childhood or adolescence have a probability of experiencing a psychiatric disorder during a 6-month to 1-year period (Angold & Costello, 2000) and research on children's psychopathology indicates that a large number of children with multiple depressive symptoms are left without necessary psychiatric assessment and help (Puura, et al, 1998), only 2 percent of schools in the US screen all children for emotional and behavioral problems (Romer & McIntosh, 2005). As a result, many children facing attentional, emotional, and/or behavioral problems are placed in public typical elementary schools without a first screening or diagnosis. These children are "at risk" for school failure, emotional difficulties and significant negative adult outcomes compared to their peers (Eisenberg, Fabes, Guthrie, & Reiser, 2000). In addition, behavior problems may also leave a legacy of low self-esteem for the child and a high level of stress for their parents (Selekman & Snyder, 2000).

One of the best ways to have a clear view of problematic behavior in middle childhood is to observe what goes on in children's everyday lives. In the absence of advanced verbal skills, observing children's motor-related behavior is the best clue to their emotions (Mol Lous, Wit, De Bruyn, & Riksen-Walrawen, 2002). Interviews with children may indeed

provide valuable information about their social life and their emotional development, but they are limited by the level of child's verbal skills. However, when one is interested in young children's behavior, the most valid and reliable information can be gathered by observing the child in different settings in order to get a clear view of how a child moves, how he or she interacts with others and how he or she deals with challenging situations or conflicts. Observational studies on depressed children show that explicit behavioral symptoms of depression, such as psychomotor agitation and retardation, can be systematically observed during standardized play procedures (Kashani, Allan, Beck, Bledsoe & Reid, 1997; Kazdin, 1990; Mol Lous et al., 2002).

For children who experiencing emotional, behavioral or other related disorders, diagnosis at an early stage is a very important issue because these children will show real improvement only given accurate assessment and consistent and intensive intervention (Eisenberg et al., 2000; Keiley, Lofthouse, Bates, Dodge, & Pettit, 2003). Early identification of emotional and/or behavioral problems can also help to minimize the long-term harm of mental disorders and reduce the overall healthcare burden and costs (Aos, Lieb, Mayfield, Miller, & Pennucci, 2004).

1.2 Informants on Children's Behavior

Information on children's behavior can be gathered by a number of informants who each have their own point of view. Parents can observe their child in a wide range of situations; nonetheless, information from the parents is not always reliable and tends to follow a pattern of idealized expectations and cultural stereotypes that can affect the reliability of their reports (Mash & Johnston, 1983). Some parents may be very sensitive to or may have a low threshold for certain behaviors and will exaggerate symptoms, whereas other parents may underreport deviant or troublesome child behaviors. The accuracy of parents as raters may vary greatly depending on such factors as education, the amount of stress associated with the child's behaviors, and hidden agenda's that parents may have when rating a child.

Apart from parents, teachers and especially teachers in primary education interact with children during many hours a day. Hence, several behavior checklists have been developed to gather information about children's well being using teacher's ratings (e.g., Achenbach, 1991). Studies have shown significant associations between diagnoses based on the Diagnostic Statistic Manual (DSM-IV, American Psychiatric Association, 2000) or the International Classification of Diseases (ICD-10, World Health Organization, 1992) and scores on empirically-based syndrome scales (Achenbach, Dumenci, & Rescorla, 2002; Hofstra, van der Ende, & Verhulst, 2002.

Although teachers considered being important informants to detect children at risk for emotional or behavioral problems, studies indicated that teachers generally don't look at misbehaviors beyond the surface level and focus mainly on students' problematic behaviors that disturb classroom activities and management (Blakeney & Blakeney, 1990). Similar to earlier studies in classrooms (e.g., Borg 1998) Goyette, Dore and Dion (2000) looked at what kind of misbehaviors occurring in Canadian schools and they distinguished three levels of misbehavior. Twenty-three percent of misbehaviors was at the first level, including pupils being distracted, talking during the lessons, or arriving late at school. Forty-two percent of misbehaviors was at the second level and included behaviors such as pupils clowning around, quarrelling, or harassing. Finally, 35 percent of misbehaviors were at the third level and included pupils criticizing, destroying material, or being aggressive. Although the most common behaviors (e.g., talking, giggling) are relatively mild and happen so often, their potential disruptive influence on the class should not be dismissed. Similarly, the fact that some behaviors (e.g., bullying, threatening behavior) happen less frequently does not make them unimportant.

1.3 Agreement among rating sources

Despite the usefulness of rating instruments for describing children's deviant behaviors, the relatively modest agreements among rating sources raise questions about the validity of the information and the importance of context or setting effects on children's

behavior. The frequency, base rate, and conspicuousness of behaviors may affect the degree of concordance among informants (Kolko & Kazdin, 1993). Considerable literature addresses issues of method effects in cross-informant studies, and there are many explanations for rater disagreement (e.g., Gadow, Drabick, Loney, Sprafkin, Salisbury, Azizian, et al., 2004; Drabick, Gadow, & Loney, 2008). In general, concordance has been found to be higher when informants have similar relationships with the children being rated than when raters represent different roles (Achenbach, McConaughy, & Howell, 1987; Greenbaum, Dedrick, Prange, & Friedman, 1994).

Physical education (PE) lessons and group play situations provide a unique opportunity to observe a child moving, interacting with his/her peers, co-operating or just being on his/her own. Physical educators spend a lot of time with the children and have the flexibility to work with them and observe their behaviors in several ways (e.g., structured lessons or free play situations) and several different settings (inside or outside the classroom, at the playground or at the school-yard). Physical education teachers have the knowledge and the skills to focus on the "warning sings" of abnormal motor related behaviors and can provide useful information about the development of school-aged children as the fact that they see and work with children within a peer group, allowing them to distinguish between maladaptive and typical age-related behaviors. Evidence for the presence of externalizing and/or internalizing symptoms can be obtained in multiple active situations, and a number of behavioral symptoms can be observed during physical education classes and team games (Kashani et al., 1997).

Despite the fact that physical educators have a privileged position in observing children in many settings and can be important informants for children's behavior, there is a lack of literature concerning the investigation of physical educators' aspects about children's emotional and behavioral problems in school settings, as the majority of research studies focus mainly on achievement and motivation in sports (Cury, Da Fonséca, Rufo, & Sarrazin, 2002; Ommundsen, 2003), and not on possible children's emotional and/or behavioral problems.

1.4 The present study

In order to investigate whether information provided by PE teachers can be useful in screening children for emotional and behavioral disorders, we examined the physical education (PE) experts' aspects about children's deviant behaviors and to what extent these aspects coincide with the official diagnostic criteria for emotional and behavioral disorders in children.

The present study included three different phases. In the first phase, a sample of primary school physical educators was asked to report the full spectrum of deviant motor related behaviors they can observe during teaching hours and to describe the most frequent and troublesome behaviors. In the second phase, diagnostic criteria that describe observable motor-related behaviors that can occur in school settings were selected from the DSM-IV (American Psychiatric Association, 2000) and the ICD-10 (World Health Organization, 1992), by a team of experts in adapted physical activity and psychomotor therapy. In a third phase, the diagnostic criteria combined with the physical educators' reports of deviant behavior were entered in a sorting task (Rosenberg & Kim, 1975; Rosenberg & Jones, 1972) in which a separate sample of 50 physical education experts participated. Participants were asked to sort all items in groups on the basis of the perceived similarity in content among the items. In the present study, the cluster analysis allowed to analyze the main categories of deviant behavior discerned by the physical educators and to investigate the overlap between educators' aspects and the official diagnostic criteria of children's deviant behavior.

2. Method

2.1 Phase 1: Developing the Physical Educators' list

In order to investigate PE teachers' view on pupils' problematic behaviors during PE lessons in primary education, an open-ended questionnaire was developed. Primary school PE teachers were asked to describe the full range of children's deviant behaviors they are able to observe during their lessons. More specifically, they were asked to describe in words the atypical motor related behaviors they observe among their pupils. The questionnaire was administered to 60 physical educators: 32 males and 28 females. These educators had an

average 10.2 years of working experience (*SD* = 3.4 years) in teaching at public elementary schools in four different cities in Greece. The study is part of a research approved by the Ethics board of the Pedagogy Department of Greek Ministry of Education and is in line with the guidelines given by the research Ethics Board of the K.U.Leuven University. The procedure was conducted during educational seminars for problematic children's behaviors in primary education, in which PE teachers voluntary applied to participated. The participants were informed in details about the study by the research team, their reports were anonymous and consent forms were obtained. Physical educator's descriptions were screened by three experts in adapted physical activity in order to formulate items of observable motor-related behaviors. Items similar in content were reduced to one item. Some of the items represented behaviors unique to PE settings.

2.2 Phase 2: Selection of Official Diagnostic Criteria

In order to select official diagnostic criteria for children's psychopathology, the Greek editions of the DSM–IV and IDC-10 were used. The same three experts in adapted PE that screened the PE teachers' items screened these diagnostic manuals for criteria that refer to motor related behaviors that are easily observable within a school environment. Given the fact that research in children psychopathology indicates high rates of symptom overlap (Klassen, Miller, & Fine, 2004) there were many criteria that coming from different diagnoses but describing the same motor-related behavior. These criteria were used only once in the final list. In a same way, when more than one behavior included in a diagnostic criterion the behaviors were divided into different items.

2.3 Phase 3: Sorting Task and Derived Similarity Matrix

The item descriptions derived from Phase 1 and 2 were included in a sorting task. In order to investigate physical educators' perceptions of children's deviant behaviors and how they perceived these different forms of deviant behaviors as parts of a specific category, a sample of 50 physical educators participated. This sample was compiled by inviting physical educators who applied for attending educational seminars about children's problematic

behaviors in school settings to participate. The participants were contacted at their work address at schools by mail. After accepting to participate, they received a letter with written instructions. Among the participants were 29 males (58%) and 21 females (42%). The participants had on average 7 years of teaching experience in primary education (*SD* = 4.2). With respect to their educational training, 30 (60%) had a bachelor degree, 17 (35%) a master diploma and 3 (5%) a PhD in school physical education. Before contacting the study, written consents from each of the physical educators were obtained. Data were anonymous and the study was in line with the guidelines given by the research Ethics Board of the K.U. Leuven.

For the sorting task, each item from the diagnostic criteria and the physical education list was written on a separate card. The cards were sent to the participants in a random order. Participants were asked to sort the cards into different categories based on their perceived similarity in content using their own personal criteria, their experience and their theoretical knowledge for this delineation. There were no limitations as to the number of categories or the number of items within each category.

A similarity matrix of the sorted items was derived by counting the number of times participants sorted a pair of items in the same group. The similarity matrix was submitted to a hierarchical cluster analysis (using SPSS 15.0) in order to delineate subsets of similar items (called clusters) and the hierarchical structure among these clusters. The complete linkage method which leads to fewer, but more homogeneous clusters (e.g., Finch, 2005), was preferred over the single linkage method as it gave a better interpretation of the data.

3. Results

3.1 Phase 1: Reported Children's Deviant Behaviors during PE.

Participants were asked to describe children's deviant behaviors observed during PE lessons in school settings. The number of behaviors reported varied between 4 and 12, with an average of 8 items per rater. Based on these reports, 65 different behaviors were formulated into items describing deviant children's' behaviors (see Appendix A).

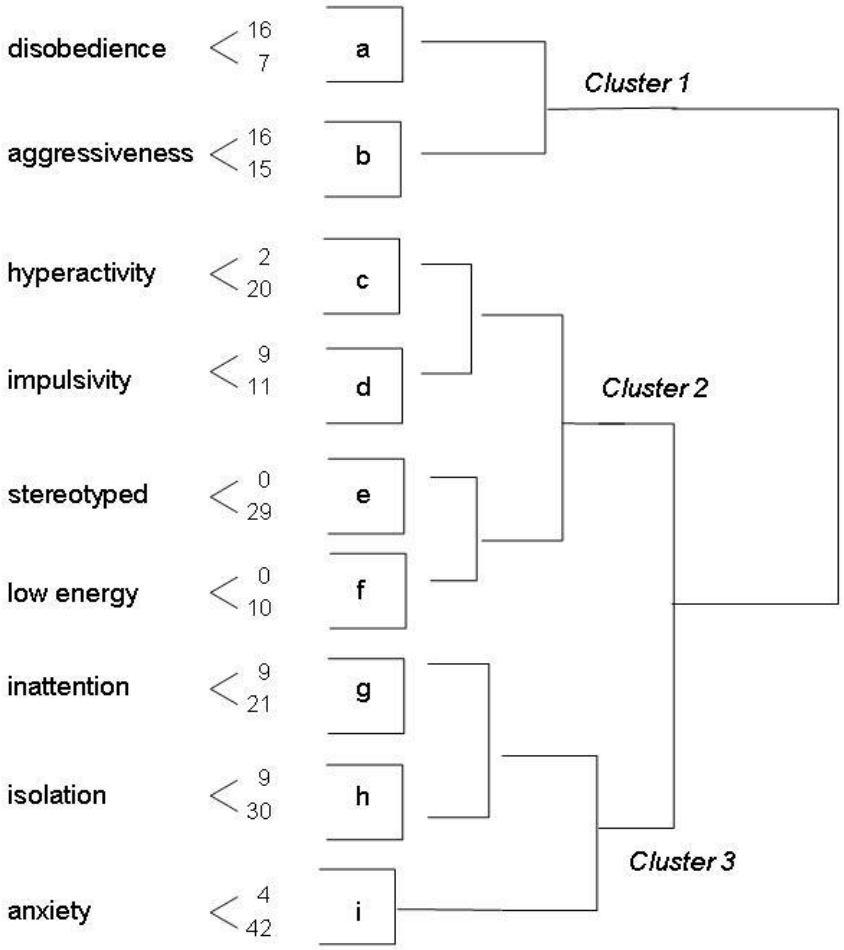
A content analysis of the list, derived from psychical educators' reports, revealed that 44 of the 65 items (68%) were statements about children's behavioral problems as disobedience, negative reactions to rules, aggressive behaviors and bullying tendency towards classmates. In addition, 13 out of the 65 items (20%) were statements describing lack of concentration, attention deficits, careless mistakes, and impulsive motor-related behaviors. Finally, only eight statements (12%) referred to problematic social behaviors. These items were describing lack of communication with peers and/or teachers, inability of the child to co-operate and interact with others and child's anxiety, mainly connected with lack of self-confidence.

3.2. Phase 2: Selection of Official Diagnostic Criteria

The screening of the DSM–IV (APA, 2000) and IDC-10 (WHO, 1992) for motor-related behaviors that are observable at school led to a list of 145 diagnostic criteria. After splitting multiple criteria into single observations, the final list consisted of 187 items. Twenty-one percent of the selected criteria items came from pervasive developmental disorders. Anxiety disorders, such as social phobia, generalized anxiety disorder, post-traumatic disorder, accounted for 20 percent of the items. Fifteen percent of the items came from mood disorders (c.q. major depressive). Finally, the majority of items (43%) referred to impulse-control disorders, namely oppositional defiant disorder (ODD), conduct disorder (CD), and attention deficit/hyperactivity disorder (ADHD). An important observation was that some of the statements obtained in Phase 1 were very similar in content to the official diagnostic criteria derived in Phase 2. For example, when describing motor-related behaviors about disobedience, and the violation of rules, the PE teachers used statements like 'the child initiates physical fights', 'the child displays physical violence' and 'the child plays too rough during team games or displays negative reaction to rules'. These observations are comparable with the behaviors proposed as criteria for the diagnosis of CD or ODD. According to the DSM-IV (APA, 2000), being physical cruel to people or actively defying or refusing to comply with adults' requests or rules, are criteria for these diagnoses. Moreover, behaviors

considering attention problems and hyperactivity were proposed by the physical educators. These behaviors were formulating items like: 'the child displays difficulties in concentration during lesson', 'the child makes careless mistakes', or 'the child cannot wait his/her turn to perform', which are very close in content to the criteria proposed by the DSM-IV (APA, 2000) for the diagnosis of ADHD in children. Finally, considering problems in the social domain, the physical educators proposed items describing isolation and difficulties in communication using statements like 'the child displays isolationist tendencies', 'the child doesn't hang out with other children and keeps to him/herself', "the child is afraid to try new tasks, or approaches new tasks with 'I can't do it' response". These kinds of items are close to the behaviors proposed as diagnostic criteria for the diagnosis of Social Anxiety disorder. Examples of physical educators' statements in agreement with diagnostic criteria are presented in Table 1

Insert Table 1.



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3.3 Phase 3: Sorting Task

A final list of 252 items derived during phase one and two. A sample of 50 PE teachers participated in a sorting task with the request to rate these items into different categories based on their similarity in content. Two participants were excluded from the final data set due to

incomplete sorting. For the remaining participants, the number of groups used in the sorting task varied between 2 and 12 groups. The majority of the PE teachers placed the items into 4 or 6 different groups.

3.4. Structure of the Cluster Solution

Figure 1 presents the complete linkage solution of the derived similarity matrix. The leaves of the solution were grouped into nine subclusters (labelled 'a' through 'i' in Table 1). The nine subclusters were themselves clustered on the basis of their similarity into three clusters (labelled 1 to 3 in Figure 1). Cluster 1 contained two subclusters. Cluster 2 was composed of two clusters containing two subclusters each. Finally, cluster 3 contained three subclusters.

The similarity among the items in the nine subclusters ranged from 75% to 90%, implying that between 36 and 42 out of 48 physical educators sorted these items together in the same group. Hence, these items can be assumed to be homogeneous in content. At the second level of clustering, agreement among raters ranged between 54% and 71%.

Insert Figure 1 here

3.5. Interpretation of the Subclusters.

Subcluster A contains 23 items regarding disobedience. The 16 PE items of this subcluster describe violation of rules and disobedience during PE classes. The diagnostic criteria in this cluster came from the Oppositional Defiant disorder (ODD). Subcluster B refers to aggressive behavior. Physical educators proposed sixteen out of the total 31 items describing aggressive students' behaviors. The remaining items belonging to this cluster were criteria from DSM-IV and IDC-10 for the diagnosis of CD and ODD.

Subcluster C contained 22 items describing hyperactive behaviors from which only two were behaviors proposed from PE teachers. The diagnostic criteria came from the Attention Deficit Hyperactivity disorder (ADHD). Subcluster D contained 20 items

corresponding to impulsive behaviors out of which 9 derived from physical educators' reports. The other items came from the ADHD disorder and ODD.

Subcluster E contained 29 items describing stereotyped motor behaviors and motor clumsiness. Subcluster F consisted of 10 items describing tiredness and low energy behaviors. Neither of these two subclusters contained items that came from physical educator's reports. The items from the diagnostic manuals came from the Pervasive Developmental disorder and Depression disorder.

Items describing inattention and weakness in concentration were clustered together in subcluster G. Of the 32 items, 9 items were derived from physical educators' reports. The other items came from the diagnostic criteria of ADHD. Subcluster H contained 39 items concerning behaviors connected with problems in the social domain, such as isolation and lack of communication with peers and teachers. Physical educators proposed only 9 of those items. The other 30 items came from the diagnostic criteria of Pervasive Developmental disorder, Social phobia and Stress disorder. Finally, 46 items describing anxiety were sorted together forming Subcluster I. Only four items of this subcluster were proposed by physical educators as deviant motor related behaviors.

3.6. Distribution of the PE Items in the Cluster Solution

The complete list of items contained 65 PE items and 187 diagnostic criteria, hence, the overall odds ratio of PE items to diagnostic criteria is about 1:3 or .33. Looking at the distribution of the PE items in each of the subclusters (see Figure 1), one can see that there is a relative overrepresentation of PE items in subclusters A, B, and C with odds ratio's of 2.21, 1.1, and 0.8, respectively as the majority of physical educators On the other hand, there is a clear underrepresentation of PE items in subclusters E and F, where the odds ratio equals 0, and in subclusters C and I, where the odds ratio equals 0.1. Finally, for subclusters G and H, the odds ratio of the number of PE items to the number of items coming from diagnostic criteria is in line with what one can expect on the basis of the overall frequency, namely, 0.43 and 0.33, respectively.

4. Discussion

For many children and parents the first opportunity for a systematic screening on mental health problems is when children begin school. Teachers are an important source of information, and screening instruments that are based on teachers' ratings have been developed (Achenbach, 1991; Gadow & Sprafkin, 2002; Shapiro, 2000; Conners, 1997). However, physical educators may supplement the observations made by classroom teachers, as they see the children in a wide range of situations differing in the level of structuring (e.g., free-play situations, strict instructions), the type of interactions (e.g., children interacting with their peers or on a one-to-one basis with the PE teacher), and the amount of physical activity involved (e.g., doing tough physical exercises, or listening to the explanation of the rules of a game).

The results from the present study reveal that PE teachers are able to observe deviant or problematic motor related behaviors among their students in school settings. In the first phase of the study, they generate a wide range of problematic behaviors many of which resembled with criteria for children's emotional and behavioral disorders from diagnostic frameworks. In the third phase of the study, the PE teachers were able to discern patterns of similar behavior among the items, leading to a meaningful hierarchical cluster analysis. Meaningful subclusters were obtained from the cluster solution and the hierarchical structure resembled the well-known distinction between externalizing and internalizing problem behavior.

However, the PE teachers' view on what refers to deviant behavior may be biased. By comparing the number of items generated by the PE teachers to the number of items in the diagnostic frameworks that refer to problematic motor-related behavior at school, one could infer that PE teachers tend to focus more on externalizing than on internalizing problematic behavior. Almost half of the PE-items were contained in the subclusters on disobedience and aggressiveness. For these subclusters, the number of PE items also outnumbered the number of diagnostic indicators. Of course, the latter finding may also be explained by the fact that some of the PE items are referring to very specific situations whereas the diagnostic criteria

are formulated at a more abstract level. However, this alternative explanation does not take away the observation that the PE teachers clearly mention more externalizing behavior than internalizing behaviors, and that for some internalizing problem behavior; they did not mention any comparable items.

Despite their apparent focus on externalizing behavior, it is remarkable that the PE teachers did not mention items that refer to hyperactivity. This may be explained in two ways. Either the teacher sees the hyperactivity as disobedience or some form of aggressiveness, or hyperactive children show less problem behavior during PE lessons, as these lessons give them the opportunity to be active.

With respect to internalizing problem behavior, the PE teachers did not mention items that referred to children having low energy or to children showing stereotyped behavior. The PE teachers also mentioned only a few items referring to anxiety disorders; despite the fact that the 'anxiety' sub cluster I contained by far the highest number of diagnostic criteria, being about one fifth of the total number of diagnostic criteria. The latter is not surprising given that the anxiety disorders refer to a wide range of disorders. The absence of PE observations on depressive, autistic or anxiety disorders can be related to the fact that physical educators in Greece have no formal education on children's psychopathology. Nevertheless, the physical educators did mention problem behavior related to attentional and social problems.

One possible explanation why PE teachers tend to focus more on externalizing deviant behaviors rather than on internalizing deviant behaviors is that the former types of behavior are more difficult to deal with as they clearly disturb the class management and, hence, place demands on educators' management skills. In recent years, effective behavior management has become even more challenging with the inclusion of an increased number of students identified as at-risk or with serious behavior problems in general PE classes. PE teachers agree that lack of behavior management skills is the most significant barrier to effective teaching (Siedentop & Tannehill, 2002). In addition, research in this domain suggests that the inability to manage and motivate students' behavior is often the "number one" reason by beginning

teachers for leaving the teaching profession (Elam, Rose, & Gallup, 1994; Kullina, Corthan, & Regualos, 2003).

An alternative explanation for the PE teachers' bias towards externalizing in comparison to internalizing problematic behavior may be found in the empirical reality of children's mental health problems. The reported prevalence of externalizing problems (attention and conduct problems) in young children is about 6.8% in typical population when the reported rate is below 2% for internalizing behaviors referring to anxiety and depression symptoms. This is in line with research in children psychopathology (e.g., Klassen, Miller, & Fine, 2004) which indicates that there are high rates of overlap of behavioral symptoms in children and externalizing problem behavior is present in most of children's emotional and behavioral disorders.

4.1. Practical implications and recommendations for future research.

The present study revealed that there is a great degree of correspondence between the PE teachers' aspects of children's problematic behavior and the official diagnostic criteria on children's psychopathology. Physical education teachers may be able to provide important and accurate information for detecting children at risk for emotional and behavioral problems during PE lessons in school settings. This is in line with Flanagan, Bierman, & Kam, (2003) who suggested that educators observe different aspects of children during their lessons and are able to identify young children at high risk for school adjustment problems related to attention, conduct, learning, and mood with a great deal of accuracy. Taking into consideration the fact that education research indicates that early identification for emotional and/or behavioral problems can help to minimize the long-term harm of mental disorders and reduce the overall healthcare burden and costs (Aos et al, 2004), the information provided by this study could be used for various educational purposes. These educational purposes could be not only research projects or intervention programs for elementary students, but also and aid to supplementary educational programs for pre service and in service physical education teachers. The results

could help physical educators to better understand their student's behaviors and the information provided may contribute in developing class management techniques.

Future research studies should investigate the supplementary value of involving physical education teachers in the assessment procedure. Based on the results of the present study, a future research may focus on developing a screening instrument for physical education teachers in order to select children at risk for emotional and behavioral problems, by observing them during PE lessons in school settings.

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