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Long-term effectiveness of a school-based primary prevention program for anorexia nervosa: A 7-to 8-year follow-up

Luise Adametz [a,*], Felicitas Richter [a], Bernhard Strauss [a], Mario Walther [b], Katharina Wick [a], Uwe Berger [a]

[a] Jena University Hospital, Institute of Psychosocial Medicine and Psychotherapy, Stoystr. 3, D-07743 Jena, Germany
[b] Jena University Hospital, Institute of Medical Statistics, Computer Sciences und Documentation, Bachstr. 18, D-07743 Jena, Germany

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ABSTRACT

Purpose: This is the first study to evaluate the long-term effectiveness of a school-based prevention program in Germany. The aim is to determine the long-term effects of the primary prevention program *PriMa* (Primary prevention of anorexia nervosa in preadolescent girls) on disordered eating and body self-esteem from childhood to young adulthood.
Methods: PriMa was conducted and successfully evaluated in a quasi-experimental pre-post design with a control group from 2007 to 2008 consisting of 11–13 year old girls (N = 1508) from Thuringian schools in Germany. Seven to eight years after the intervention, the same cohort (mean age 19.8 years) was invited to complete an online survey. Disordered eating (EAT-26), body self-esteem (FBeK) and BMI were assessed via self-report. The response rate at seven-to-eight-year follow-up was very low (7%). Data of N = 100 girls were analyzed.
Results: Concerning changes in disordered eating, results revealed no significant long-term effect of *PriMa* seven to eight years after the intervention. During this time, disordered eating remained stable without a significant increase or decrease. Regarding changes in body self-esteem, group courses differed significantly from each other. The results revealed a significant main effect of group, indicating significant differences in changes of body self-esteem between the intervention and the control group. Following the analysis of these changes of body self-esteem over time, it was found that the intervention group revealed an increase of body self-esteem after program participation and remained stable over time. By contrast, the control group revealed a decrease of body self-esteem over time.
Conclusions: Long-term intervention effects of *PriMa* could be found for body self-esteem but not for disordered eating. The findings suggest that *PriMa* prevented a decrease of body self-esteem from childhood to young adulthood. For a broader dissemination it is necessary to implement prevention programs consistently in school settings. In order to maintain the prevention effects, it would be interesting to investigate the effects of booster sessions which refresh the programs content on a regular basis. Furthermore, the results of this study revealed the implementation difficulties of primary prevention programs especially concerning the retention of the sample size.

1. Introduction

In early adolescence, clinically relevant eating disorders (ED), especially anorexia nervosa (AN), are scarce (Treasure, Stein, & Maguire, 2015; Wentz, Gillberg, Anckarsater, Gillberg, & Rastam, 2009). Nevertheless, disordered eating and partial syndromes are widespread among children and adolescents (Patton, Coffey, Carlin, Sanci, & Sawyer, 2008) and are associated with a negative impact on psychosocial functioning, internalizing and externalizing behavioral problems, reduced quality of life (Herpertz-Dahlmann, Wille, Holling, Vloet, & Ravens-Sieberer, 2008) and increased rates of comorbid symptoms (e.g. depression, anxiety, substance misuse) (Patton et al., 2008). Using a long-term perspective, disordered eating during childhood and adolescence may lead to a higher risk of disordered eating in young adulthood as well as overweight, obesity and depressive symptoms (Herpertz-Dahlmann, Dempfle, Konrad, Klasen, & Ravens-Sieberer, 2014). However, longitudinal studies indicate that disordered eating and body dissatisfaction remain stable or increase from adolescence to adulthood (Herpertz-Dahlmann et al., 2014; Slane, Klump, McGue, & Iacono, 2014). This is important considering that disordered eating may result in clinically relevant eating disorders (EDs) (American Psychiatric Association, 2013). Moreover, early AN

* Corresponding author.
E-mail addresses: luise.adametz@med.uni-jena.de (L. Adametz), felicitas.richter@med.uni-jena.de (F. Richter), bernhard.strauss@med.uni-jena.de (B. Strauss), mario.walther@eah-jena.de (M. Walther), katharina.wick@med.uni-jena.de (K. Wick), uwe.berger@med.uni-jena.de (U. Berger).

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symptoms (without fulfilling the criteria for a clinical syndrome) are associated with a higher risk of developing a clinically relevant AN in young adulthood (Herzog, Hopkins, & Burns, 1993).

Although EDs are relatively rare among the general population, they have a crucial impact on health and significantly impair psychosocial functions (Klump, Bulik, Kaye, Treasure, & Tyson, 2009). EDs are difficult to treat, are associated with high treatment costs (Wang, Nichols, & Austin, 2011) and their course is often chronic (Halmi, 2005; Steinhausen, 2002). Prevalence estimations of disordered eating behavior (as an early syndrome of AN and other ED) for German girls and boys are approximately 33% and 15%, respectively (Herpertz-Dahlmann et al., 2008). These facts illustrate the urgency and need for development, long-term evaluation and low-cost dissemination of prevention programs and political preparation of the results.

In order to describe the course of AN, and in EDs in general, as well as the possible impact of interventions, Treasure et al. (2015) proposed a longitudinal staging model for eating disorders that included risk factors and appropriate interventions for each stage. The first stage is defined as "high risk" where AN risk factors, such as obsessive-compulsive traits, attentional bias and cognitive inflexibility, occur. During this stage, effective prevention programs are characterized by processing socio-cultural topics using cognitive dissonance inducing methods. The next stage towards the development of an AN is called "early syndrome", including early forms of the disorder, such as disordered eating and weight concerns. This is followed by the stages "full syndrome" and "severe enduring illness". According to Treasure et al. (2015), prevention programs should be addressed mainly at the first stage.

1.1. Prevention programs and their effects

In order to reduce risk factors and prevent the onset and sequelae of EDs, several research teams have already developed a rather large number of universal and selective prevention programs over the past two decades. Those were mainly carried out in schools and addressed the first and second stages according to the stage model (Ciao, Loth, & Neumark-Sztainer, 2014; Stice, Shaw, & Marti, 2007; Treasure et al., 2015; Yager, Diedrichs, Ricciardelli, & Halliwell, 2013). According to Levine and Smolak (2006), schools are highly appropriate settings for the delivery of prevention programs. They have potential for sustained interactions with young students in different developmental stages. In systematic and meta-analytic reviews, important features of prevention programs were identified, leading to successful program outcomes (Ciao et al., 2014; Stice & Shaw, 2004; Stice et al., 2007; Yager et al., 2013). Successful programs were theory-driven, interactive, delivered in multiple group sessions by professionals, and targeted at least one eating disorder risk factor. Furthermore, programs that targeted risk groups (selective), females only and older participants (age $\geq$ 15 years) showed larger effect sizes (Stice et al., 2007; Wilksch, 2014). Interestingly, another meta-analytic review suggests that when it comes to body image, programs are more effective with younger participants (Yager et al., 2013). Although most programs were able to reduce some ED risk factors, no prevention program worked for all risk factors. The success rate of reducing risk factors was about 51%. Concerning eating pathology, the existing prevention programs reduced disordered eating only in 29% (Stice et al., 2007). This might be due to the fact that most prevention programs consisted only of a few sessions, were too short to have strong impact effects on attitudes and behavior and addressed a general universal sample.

1.2. The primary prevention program PriMa

Primary prevention efforts of ED were also made in Germany. Hence, between 2004 and 2009, the prevention programs *PriMa* (primary prevention of anorexia nervosa in preadolescent girls) for female sixth graders and *Torera* (prevention of disordered eating in terms of bulimia nervosa and binge eating disorder) for male and female seventh graders were developed. The current research focuses on *PriMa*. For further information on *Torera*, see Berger et al. (2014).

PriMa is a primary prevention program that aims to decrease risk factors of AN (e.g. weight concerns, negative body image, dieting) and to increase protective factors (e.g. body self-esteem, knowledge) and consequently reduce the occurrence of AN over the long-term (for an overview of the *PriMa* content, see Table 1). According to Levine and Smolak (2006), the program is classified as "primary" prevention because it includes a universal, as well as a selective, character. *PriMa* is designed to be delivered in classroom curricula for general use, is supported by public policy and is suitable for large groups (universal). However, it focusses on pre-adolescent girls as a non-symptomatic, but high-risk, group (selective).

PriMa focusses only on anorexia nervosa (AN) because the incidence is earlier than for bulimia nervosa and binge eating disorder (Wick et al., 2011). The program is designed for 11–13 years old girls, is delivered by teachers and consists of nine 45-minute sessions based on teaching exercises (e.g. role plays, exercises, analyses of film sequences, poster discussions) regarding the most relevant issues related to AN. Based on the cognitive dissonance theory (Festinger, 1957), the girls discuss normal AN-related issues (ideals of beauty, rebellion, power), problematic issues (loss of control, distorted body image, suicidal thoughts) and clinical issues (rigid rituals of eating, weight phobia, depression) (for further information, see Berger (2008); Wick et al. (2011)). In order to implement the program under real world conditions and to ensure

Table 1
Content of *PriMa*.

PriMa-lection	AN-specific risk factors and *protective factors*	Content and goals of *PriMa*-lections
1	Thin body ideal	Reflecting beauty ideals, Being thin
	Media literacy	How it is to be a model
2	Low level of attention	Expectations, rebellion against authorities and reflecting thoughts and feelings against parents
	Knowledge about alternatives to gain attention	Compromises and getting to know possible alternatives
3	Perfectionism	Reflecting one's own ambitions concerning perfectionism and superiority
	Ability to compensate weakness	High self-esteem
4	Over-evaluation of food dieting	Dealing with healthy and unhealthy foods
	Knowledge about healthy nutrition	Training on proper consumption
5	Negative body image	Body image, getting a better body awareness, reflecting attitudes and feelings against one's own body
	Positive body image	Understanding of distorted body awareness
6	Inadequate coping strategies	Problems in families, management of feelings and moods (e.g. sadness), reflecting thoughts and feelings against parents
	Adequate coping strategies	
7	Inadequate problem solving	Solving problems, recognizing distorted eating behavior, reflecting own problems, asking for help
	Adequate problem solving	Learning about alternatives
8	Inadequate coping strategies	Consumed by the addiction, blunting of emotions, learning how to deal with comparisons
	Knowledge	Balance determines life, being aware of the danger of dependencies, accepting own deficiencies
9	Inadequate problem solving	Course of anorexia, asking for help, getting to know offers of help/ways out of sadness and depression
	Knowledge	Changing roles, being aware of the danger of thinness

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