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Real-world effectiveness of a German school-based intervention for primary prevention of anorexia nervosa in preadolescent girls

Katharina Wick *, Christina Brix [1], Bianca Bormann [1], Melanie Sowa [1], Bernhard Strauss [1], Uwe Berger [1]

Institute of Psychosocial Medicine and Psychotherapy, University Hospital, Friedrich-Schiller-University Jena, Stoystr. 3, 07740 Jena, Germany

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ABSTRACT

Objective. Anorexia nervosa ('AN') is notoriously difficult to treat, has high mortality rates, and has a prevalence peak in 15-year-old girls. We developed a German school-based intervention program ('PriMa') for the primary prevention of AN in preadolescent girls and assessed the effects in a sample of Thuringian girls.

Method. Intervention involved nine guided lessons with special posters and group discussions. A parallel controlled trial with pre-post measurements and a three-month follow-up was conducted in 92 Thuringian schools ($n = 1553$ girls) in 2007 and 2008. Primary outcomes were conspicuous eating behavior, body self esteem, and AN-related knowledge.

Results. After adjusting for the girls' ages and the type of school, we observed significant improvements in the areas of knowledge ($d = .24$) and body self esteem ($d = .29$), but not for eating behavior.

Conclusion. The PriMa intervention provides an efficient and practical model to increase AN-related protection factors.

Introduction

Anorexia nervosa ('AN') is one of the most serious psychiatric disorders in girls and young women. The Diagnostic and Statistical Manual of Mental Disorders (DSM IV-TR) includes four criteria for diagnosing AN (see Table 1). Because it is difficult to treat (Steinhausen, 2002) and because of its high mortality rate (>15%; Zipfel et al., 2000), the disease has gained much attention from the public and from the scientific community. AN's prevalence is estimated at 0.5 to 3.7%, with a peak of incidence at age 15 (Hoek and van Hoeken, 2003; Bulik et al., 2006). Several of AN's symptoms are considerably more common (Grilo, 2006), which are known as sub-clinical expressions of AN. In view of this, groups around the world have spent decades developing prevention programs to prevent the onset and consequences of AN and other eating disorders (for review, see Levine and Smolak, 2006).

According to the standards of the Society of Prevention Research ('SPR'), a successful prevention approach includes the demonstration of efficacy (level 1) as well as the probation in the field under real-world conditions (level 2 'effectiveness'). 'Real-world conditions' mean regular conditions in everyday life without the motivational character of a new program introduced for the first time. Furthermore, an appropriate dissemination is necessary to secure sustainability (level 3 'broad dissemination'; Flay et al., 2005).

Most of the existing prevention programs do not meet all of the standards, including level 2 and 3. For this reason, in 2003, our institution began cooperating with the Thuringian Ministry of Education ('TME') to develop the program called 'Primary prevention of anorexia nervosa in preadolescent girls' ('PriMa'). Our program focuses exclusively on AN, because it occurs earlier (peak of incidence: 15 years) than bulimia nervosa and binge-eating disorder (peak of incidence: 18 years; Grilo, 2006). In 2004 and 2005, we conducted a pilot study to evaluate the process and impact of PriMa (level-1 evaluation; $n = 1006$ girls; mean age = 12 years; Berger, 2008). This study showed significant improvements in pre–post measurements and pre–follow-up measurement on body self esteem, eating behavior, and knowledge.

Furthermore, we paired with the Heidelberg Prevention Center (www.h-p-z.de; level-3-evaluation; see Berger et al., 2008) to create appropriate distribution structures. Two well-known meta-analyses (Stice and Shaw, 2004; Stice et al., 2007) have summarized the effects of over 80 international programs for the prevention of eating disorders. The authors clearly identify factors that successful programs exhibit:

- interactive (vs. didactic),
- selective, for risk groups (vs. universal),
- multisession (vs. single-session),
- gender specific, offered only to females (vs. co-educative),
- offered to participants over age 15 (vs. younger participants), and
- delivered by professionals (vs. endogenous providers like teachers).

* Corresponding author. Fax: +49 3641 936546.
E-mail addresses: katharina.wick@med.uni-jena.de (K. Wick), christina.brix@med.uni-jena.de (C. Brix), bianca.bormann@med.uni-jena.de (B. Bormann), melanie.sowa@gmx.de (M. Sowa), bernhard.strauss@med.uni-jena.de (B. Strauss), uwe.berger@uni-jena.de (U. Berger).
[1] Fax: +49 3641 936546.

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Table 1
DSM-IV criteria for Anorexia nervosa (AN), and examples for criteria A–C from the PriMa study (Thuringia, Germany, 2007-2008).

A	A refusal to maintain body weight at or above a minimally normal weight for age and height (usually less than 85% of ideal body weight)	The 3rd percentile (weight group: extremely underweight) according to Kromeyer-Hauschild et al. (2001)
B	Intense fear of gaining weight or becoming fat	I am preoccupied with a desire to be thinner.[a] Engage in dieting behavior (eat little or only selected food).[a] I am terrified about being overweight.[a]
C	Disturbance in the way one's body weight or shape is experienced, with denial of current low body weight	I am preoccupied with the thought of having fat on my body.[a]
D	Amenorrhea in postmenarchal females of at least 3 menstrual cycles[b]	

[a] Items included in the AN-specific subscale.
[b] Not relevant for the population.

Because of the early peak of incidence of AN, we decided to focus PriMa on 6th-grade girls with a mean age of 12 years. According to most of the programs, PriMa is geared to the WHO-recommended 'Setting Approach' (Stewart-Brown, 2006), realizing the program in schools. We focused primarily on girls because adolescent girls and young women are 10-times more likely to exhibit incidents of AN (Grilo, 2006). We adopted a universal prevention program to avoid labeling the participating girls who were already suffering from (subclinical) eating disorders or showing specific risk factors. Other universal prevention programs were very effective (Becker et al., 2005; Raich et al., 2009) and primary prevention by definition includes this universal character. Furthermore, our cooperation partners insisted using teachers to implement the project rather than independent professionals on the theory that teachers would improve the program's sustainability.

Existing prevention programs concerning eating disorders focused on decreasing risk factors (e.g. weight concerns, negative body image, dieting, and low social support; Jacobi et al., 2004) and strengthening protective factors (e.g. body self esteem, and knowledge). The present study aims to follow this primary preventive approach (Caplan, 1964) to reduce the occurrence of AN (see Table 2). Furthermore we intend to replicate the results of the pilot study concerning the effects of the PriMa program under real-world conditions (level 2; Berger et al., 2008). In this context, the focused research question is whether the primary preventive intervention program, PriMa, is able to significantly improve the primary outcomes eating behavior, body self-esteem, and AN-related knowledge in comparison to a control group?

Methods

Study design and subjects

We designed a controlled trial with (post-hoc) parallel group assignment using pre-post-design, supplemented by a follow-up-measurement after about three months. Before starting the program, we first obtained the consents of the parents, the supervisor of the TME, and the ethics committee of the Jena University Hospital. Our close cooperation with TME required several compromises because TME was focused on the practical effects of the program rather than the underlying research project. Because the program was open to all interested schools, our cooperation partners insisted on conducting the program without a randomized group assignment. Furthermore, we were prohibited from creating waiting-list conditions and switching classes (intervention group vs. control group) at mid-year. This was necessary to ensure sustainability and to not discourage the participating schools.

Table 2
Overview of the nine PriMa-lections.

PriMa-lection	AN-specific risk factors and *protective factors*	Content of PriMa-lections	Goals of PriMa-lections	Impact on outcomes (*item example*)
1	Thin body ideal *Media literacy*	Beauty ideals Being thin How it is to be a model	Reflecting beauty ideals	Increasing body self esteem and knowledge (*Being thin is always an advantage)*
2	Low level of attention *Knowledge about alternatives to gain attention*	Expectations Rebellion, rebellion Against authorities Compromises	Reflecting thoughts and feelings against parents Discussing attention by emaciation Getting to know possible alternatives	Increasing eating behavior *(I feel that others would prefer if I ate more)* and knowledge
3	Perfectionism *Ability to compensate weaknesses*	Superiority Perfectionism High self-esteem	Reflecting one's own ambitions	Increasing eating behavior *(I am preoccupied with a desire to be thinner*), body self esteem and knowledge
4	Overevaluation of food dieting *Knowledge about healthy nutrition*	Healthy eating effect of waiver	Dealing with healthy and unhealthy foods Training of consumption	Increasing eating behavior *(I avoid foods with sugar in them)* and knowledge
5	Negative body image *Positive body image*	Body image Body awareness	Getting a better body awareness Reflecting attitudes, feelings against one's own body Understanding of distorted body awareness	Increasing body self esteem *(I am satisfied with my own body)* and knowledge
6	Inadequate coping strategies *Adequate coping strategies*	Problems in family Sadness	Management of feelings and moods Reflecting thoughts and feelings against parents	Increasing knowledge *(If there are problems, then it is a waste of time, to look for compromises with the parents)*
7	Inadequate problem-solving *Adequate problem-solving*	Solving problems Recognizing distorted eating behavior	Reflecting own problems Asking for help Learning about alternatives	Increasing knowledge *(If a girl does nothing really well, then she should at least be good in losing weight)*
8	Inadequate coping strategies *Knowledge*	Imprisonment in the addiction Blunting of emotions Balance determines life	Learning how to deal with comparisons Being aware of the danger of dependencies Accepting own deficiencies	Increasing body self esteem *(I am satisfied with my height and weight)* and knowledge
9	Inadequate problem-solving *Knowledge*	Course of anorexia Asking for help Changing roles	Getting to know offers of help/ways out of sadness and depression Being aware of the danger of thinness	Increasing knowledge *(It's never too late to seek help from others)*