


ORIGINAL ARTICLE

Factors influencing the duration of untreated illness among patients with anorexia nervosa: A multicenter and multi-informant study

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Funding information

Deutsche Forschungsgemeinschaft (DFG), Grant/Award Numbers: GU 1564/3-1, LO 766/16-1

Action Editor: Anja Hilbert

Abstract

Introduction: The duration of untreated illness (DUI), that is, the interval between the onset of anorexia nervosa (AN) symptoms and start of specialized treatments, has a strong influence on the prognosis.

Objective: To quantify modifiable predictors of the DUI and to derive recommendations for secondary prevention strategies.

Methods: Within a multicenter, multi-informant study, DUI was assessed in interviews with patients undergoing first specialized AN treatment. Modifiable factors were assessed perspectives of AN-patients, their relatives, and primary care practitioners [PCPs]) with the FABIANA-checklist (Facilitators and barriers in anorexia nervosa treatment initiation). The effect of FABIANA-items on the DUI for each perspective was calculated using Cox Regression (control variables: age, eating disorder pathology, health care status, migration background, body mass index [BMI]).

Results: We included data from $N = 125$ female patients with AN (72 adults, 53 adolescents, $M_{\text{age}} = 19.2$ years, $SD = 4.2$, $M_{\text{BMI}} = 15.7 \text{ kg/m}^2$, $SD = 1.9$), $N = 89$ relatives (81.8% female, 18.2% male, $M_{\text{age}} = 46.0$ years, $SD = 11.0$) and $N = 40$ PCPs

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($M_{\text{age}} = 49.7$ years, $SD = 9.0$). Average DUI was 12.0 months. Watching or reading articles about the successful treatment of other individuals with AN (patients' perspective) and regular appointments with a PCP (PCPs' perspective) were related to a shorter DUI ($HR = 0.145$, $p = .046$ / $HR = 0.395$, $p = .018$). Patients whose relatives rated that PCPs trivialized patients' difficulties had a longer DUI ($HR = -0.147$, $p = .037$). PCPs and relatives rated PCPs' competence higher than patients did.

Discussion: It is recommended (a) to incorporate treatment success stories in prevention strategies, (b) to inform PCPs about potential benefits of regular appointments during the transition to specialized care, and (c) to train PCPs in dealing with patients' complaints.

Public Significance: Many individuals with AN seek treatment very late. Our study shows that a promising approach to facilitate earlier AN treatment is to inform patients about successful treatments of affected peers, to foster regular appointments with a PCP and, to motivate these PCPs to take individuals' with AN difficulties seriously. Thus, our study provides important suggestions for interventions that aim to improve early treatment in AN.

KEYWORDS

anorexia nervosa, delivery of health care, duration of untreated illness, early diagnosis, prevention

1 | INTRODUCTION

Anorexia nervosa (AN) is a serious illness associated with a range of somatic and psychosocial impairments and, in severe cases, mortality (Arcelus et al., 2011; van Eeden et al., 2021). Poor prognosis and a chronic development are frequent (Herzog et al., 2022; Murray et al., 2019; Zipfel et al., 2000). However, independent studies have repeatedly shown that patients with AN have a better prognosis if treated in a specialized setting early after AN onset (Andres-Pepina et al., 2020; Austin et al., 2021; Fernandez-Aranda et al., 2021; Löwe et al., 2001; Treasure et al., 2021; Vall & Wade, 2016; Zipfel et al., 2000). Despite the importance of an early AN treatment, current evidence suggests an average duration of untreated illness (DUI, also referred to as duration of untreated eating disorder [DUED]) of 29.9 months with a mean range between 6.4 and 40.0 months (Austin et al., 2021; Weigel et al., 2014). Finding ways to decrease the DUI is, therefore, a yet unresolved challenge.

In order to develop evidence-based preventive measures to improve early treatment in AN, a better understanding of factors influencing the DUI is crucial. Thereby, in addition to the perspectives of affected patients, further perspectives of primary care practitioners (PCPs) and relatives should be considered: First, most patients with AN are diagnosed and referred to specialized care by their PCPs or pediatricians (Mond et al., 2008; Neubauer et al., 2014). However, a diagnostic delay and a problematically low rate of referral to mental health have been observed (Demmler et al., 2020; Higgins & Cahn, 2018; Homan et al., 2019; Hudson et al., 2013). Second, in some countries (among others e.g., the Netherlands, United Kingdom, Spain, Germany;

Treasure et al., 2021) PCPs are the primary gatekeepers to access specialized services. Third, a large part of the DUI (~2/3 of total DUI; about 2 years) relates to the period between AN onset and any first contact with the health care system (Neubauer et al., 2014). Finally, relatives or close relations play an important role, especially in the period before the first contact with the health care system (Neubauer et al., 2014). Against this background, a multi-informant approach to investigate factors influencing the DUI seems most appropriate.

In addition to the necessity to consider different perspectives on factors influencing the DUI, some factors might facilitate early treatment in AN, but might not be modifiable through preventive measures. These nonmodifiable facilitating factors for an early AN treatment include a higher body mass index (BMI; Babitsch et al., 2012; Löwe et al., 2001; Weigel et al., 2014), lower eating pathology (Regan et al., 2017), a private (vs. statutory) health insurance (Babitsch et al., 2012; Weigel et al., 2014), a nonmigrant background (Babitsch et al., 2012; Regan et al., 2017; Weigel et al., 2014) and restrictive AN subtype. Conflicting evidence exists regarding the role of the nonmodifiable factors age (Austin et al., 2021; Kästner et al., 2019; Regan et al., 2017; Schlegl et al., 2019) and comorbidity (Jacobi et al., 2014; Mack et al., 2014; Regan et al., 2017) with some indications of higher age and comorbidity in treatment seekers and others implying the opposite direction. In conclusion, potential factors influencing the DUI should be modifiable (Kästner et al., 2019; Regan et al., 2017) and carefully investigated regarding their specificity for AN (Regan et al., 2017), their respective relative importance among all factors influencing the DUI and regarding potential differences between adult and adolescent patients (Innes et al., 2017).

To this end, the project FABIANA (Facilitators and barriers in anorexia nervosa treatment initiation) was initiated (Kästner et al., 2019). Within two FABIANA pre-studies, modifiable factors influencing the DUI were identified through qualitative interviews with patients with AN, their relatives, and PCPs; (Kästner et al., 2021) and compiled into the FABIANA-checklist that was psychometrically validated (Reuter et al., 2021). This third FABIANA study had the following aims:

1. To quantify the impact of modifiable factors influencing the DUI from the perspective of patients, relatives, and PCPs while controlling for a priori selected nonmodifiable variables (significant association with DUI or treatment initiation in at least two eating disorder studies or one AN study).
2. To compare the perspectives of patients, relatives, and PCPs regarding their perception of influencing factors.
3. To derive strategies for the refinement of secondary prevention measures from the study results, in order to prospectively improve the prognosis of patients with AN.

2 | MATERIALS AND METHODS

2.1 | Participants

Patients with AN were recruited between April 2020 and December 2022 in 20 cooperating centers, including 13 inpatient centers, 4 outpatient centers, and 3 outpatient therapists specialized in the psychotherapeutic treatment for eating disorders at 11 locations throughout Germany. Inclusion criteria were age ≥ 14 years, female gender, full or subthreshold AN-diagnosis according to DSM-5, first psychotherapeutic AN treatment (current or initiated within the last 12 months). A minimum age of 14 years was chosen to ensure sufficiently consolidated higher-order cognitive functions to answer the study measures and to comply with the age limits of the applied diagnostic interviews (see below, for details see Kästner et al., 2019). “Initial psychotherapy treatment” was considered to have begun when patients had already stayed in an inpatient facility for at least 7 days or had more than five consecutive sessions in an outpatient facility out of a total planned treatment. Insufficient knowledge of German language was an exclusion criterion.

2.2 | Measures

2.2.1 | Dependent variable—DUI

The DUI was defined as the difference between the date of onset of AN and the date of first treatment initiation (in months). Full threshold AN was diagnosed during telephone interviews when the following DSM-5 criteria (Beesdo-Baum et al., 2019a) were met: (A) restricted energy intake in relation to the need of a person, that is, a significant low body weight (adults: BMI cutoff ≤ 18.5 kg/m²; adolescents:

age percentiles), (B) profound fear of gaining weight or fat or behaviors that prevent weight gain, despite an already low body weight, (C) disturbed perception of the figure or body weight, and overexaggerated impact of body weight or figure on self-esteem. Patients who met all but one of the outlined diagnostic criteria were labeled as subthreshold AN. Thereby, no weight loss threshold for a significant weight loss was formulated. The differentiation between full and subthreshold AN was not considered in the statistical analyses.

Age of onset (AOO) was also assessed during diagnostic interviews with the assistance of a life chart from the questionnaire set that combines individual important life events as recall anchors with weight development and lifetime occurrence of different AN symptoms. Interviewers repeatedly referred to this individual life chart to ensure a higher recall accuracy. AOO was defined as the concrete age (in years and months) when all criteria for AN were fully met for the first time. With respect to subthreshold AN, AOO was defined as the earliest concurrent occurrence of all other diagnostic criteria.

2.2.2 | Modifiable predictors—FABIANA-checklist

Factors influencing treatment initiation in patients with AN were assessed with the 18-item FABIANA-checklist (5-point Likert scale, 1 = strongly disagree to 5 = strongly agree) on barriers and facilitators, for example, perceived support from relatives and close others, the role of the PCP, in the process from recognizing AN to referral to specialized care. The formulations were adapted to the perspective of patients, relatives, or PCPs (e.g., replacing first person “you” by “the patient” or “your relative”). Psychometric properties of the FABIANA-checklist as well as personal relevance, comprehensibility, and recall-ability have been established within a multi-informant and mixed-methods study (Reuter et al., 2021). Overall internal consistency of the FABIANA-checklist in this study was Cronbach's $\alpha = .77$.

2.2.3 | Control variables

The control variables were operationalized as follows: age group (adult vs. adolescent), health insurance (statutory vs. private), comorbidity (≥ 1 comorbid mental disorder vs. none), and migration background (yes vs. no). AN-Subtype (restrictive vs. binge-purge). AN-Subtype and BMI (kg/m²) at intake were provided by the treating physicians or psychotherapists. Eating disorder pathology was assessed with the Eating Disorder Examination Questionnaire 8 (EDE-Q8; Kliem et al., 2016) in adults and the Child EDE-Q8 in adolescents (Kliem et al., 2017). It includes eight items assessing restraints over eating, food avoidance, preoccupation with food, feelings of fatness, the desire to lose weight, guilt about eating, dissatisfaction with weight, and discomfort with the body image. The items are rated on a seven-point rating scale (0 = characteristic was not present to 6 = characteristic was present every day or in extreme form). The global average score has a very good internal consistency for both the adult and adolescent version (Cronbach's $\alpha = .93$ and $\alpha = .89$).

Comorbidity was assessed in structured clinical interviews based on DSM-5 (SCID-CV [Beesdo-Baum et al., 2019a]; SCID-PD [Beesdo-Baum et al., 2019b]). Comorbidity was considered as being present if patients fulfilled the criteria of at least one mental or personality disorder in these interviews. Migration background was assessed through self-report as part of the questionnaire set. It was considered as being present if either the patient or at least one relative was born outside of Germany.

2.3 | Procedures

Eligible patients were recruited by their treating physicians or psychotherapists. After being informed about the study, patients were asked to provide written consent. Additional written informed consent from a parent or legal guardian was required for patients <16 years. Patients received a paper-pencil assessment battery, including socio-demographic questions, the FABIANA-checklist (Reuter et al., 2021), and the (Ch)EDE-Q8 (Kliem et al., 2016, 2017).

After completion, the assessment battery was sent via post to the central data collection point. Patients subsequently participated in structured clinical telephone interviews with trained psychologists (SCID-CV [Beesdo-Baum et al., 2019a]; SCID-PD [Beesdo-Baum et al., 2019b]) to validate the AN diagnosis and to assess AN-subtypes, AN-onset, and comorbidity. The interviews were audio-recorded.

In the assessment battery, patients were asked to name the relative and the PCP who they felt to be most important during the process of treatment initiation ("Which doctor was your most important contact in relation to the initiation of treatment?") and to provide a release of confidentiality for these two. Additional consent from parents or legal guardians was required in participants <16 years. It is important to note that patients indicated medical practitioners with a background as a family physician, general practitioner, internist, pediatrician, psychiatrist, or other specialty as their PCP. Paper-pencil assessment batteries were sent to the patient's relative and/or their PCP. To improve response rates, relatives and PCPs were reminded once by mail and once by telephone before they were excluded as dropouts.

Patients with AN and their relatives received an incentive of 30€ and PCPs an incentive of 60€ after completion of the assessment. The study was approved by the Ethics Committee of the Medical Chamber Hamburg, Germany (PV5108) and registered at Clinical Trials.gov (NCT03713541).

2.4 | Data analysis

2.4.1 | Sample description and missing data analysis

For sample characterization we used mean, standard deviation, and range for normal distributed data, quartiles for non-normal distributed data, and absolute and relative frequencies for categorical data.

Missing data analysis was carried out by comparing patients who completed all assessments, with (1) eligible patients who did not participate in any assessment and (2) patients who completed the paper-pencil assessment but not the interview. For eligible patients who did not participate in any assessment, recruitment facilities provided information on AN subtype, BMI, and comorbidity without any identifying personal data.

2.4.2 | Aim 1. Comparison of perceptions of patients, relatives, and PCPs regarding FABIANA-items

Differences in the FABIANA-items between the three groups were tested using Kruskal-Wallis test for nonparametric data with pairwise Mann-Whitney *U* tests for group differences. As these tests were performed as exploratory analyses, the *p*-values were used as descriptive measures.

2.4.3 | Aim 2. Effects of FABIANA-factors and control variables on the DUI

Preliminary findings have shown that the DUI is usually a highly skewed dependent variable (Weigel et al., 2014). Therefore, we evaluated the effects of the independent variables on the DUI using Cox Regression (Singer & Willett, 2003). We used the DUI in months to describe time until the occurrence of an event (treatment initiation). Event occurrence was set to 1 for all participants. Cox regressions were performed for patients, relatives, and PCPs separately. An initial sample size calculation based on the assumptions of an exponentially distributed DUI with an intercept of $\log 31$ (i.e., mean DUI of 31 months), six uncorrelated predictors with a moderate effect ($\beta = \log(1.3)$, a power of 80%, and an assumed nonresponse rate of 25%, resulted in a necessary sample of $n = 173$ recruited participants (Kästner et al., 2019). Deviating from the published study protocol, in the actual analysis 7 control variables and 18 FABIANA items were included. However, the analyses conducted were not confirmatory at all.

In the first block, seven control variables, namely age group, comorbidity, health insurance, migration background, BMI, AN-subtype, and eating disorder pathology, were included into the model (rationale: see section "measures"). In a second block, we included the FABIANA-items as explanatory variables. Backward selection was used for both blocks. For each model, $-2LL$ and overall chi-square values are presented. Parameter estimates, standard errors, confidence intervals, and *p*-values are reported for the variables in the model.

We performed missing data analysis for the FABIANA-checklist. The proportion of missing values on single items of the FABIANA-checklist was 4.5% in the sample of patients, 7.1% in the sample of relatives and 5.3% in the sample of PCPs. We imputed the missing values using expectation-maximization imputation function included in SPSS. For the 1.3% missing values in the patient's EDE-Q8, we followed the same procedure.

All statistical analyses were performed with SPSS 28.0.

TABLE 1 Sociodemographic and clinical characteristics of the patient sample by age group.

		Age group ^a			p
		Total sample (n = 125)	Adults (n = 72)	Adolescents (n = 53)	
Sociodemographic background	Age, M in years (SD); Md, (Q1, Q3) ^b	19.2 (4.1); 18.0 (16.0, 21.5)	21.8 (3.6); 21.0 (19.0, 23.0)	15.7 (1.0); 16.0 (15.0, 16.0)	<.001
	Education level, n (%)				<.001
	≤9 years	39 (31.2)	2 (2.8)	37 (69.8)	
	10–11 years	27 (21.6)	11 (15.3)	16 (30.2)	
	12–13 years	46 (36.8)	46 (63.9)	0 (0)	
	High school / University	13 (10.4)	13 (18.1)	0 (0)	
	Civil status, n (%)				.199
	In a relationship	23 (15.4)	16 (22.2)	7 (13.2)	
	Single	102 (81.6)	56 (77.8)	46 (86.8)	
	Living conditions, n (%)				<.001
	Alone	16 (12.8)	16 (22.2)	0 (0)	
	With (a) parent(s)	88 (70.4)	38 (52.8)	50 (94.3)	
	With the partner	12 (7.2)	9 (12.5)	0 (0)	
	Other (e.g., shared apartment)	12 (9.6)	9 (12.5)	3 (5.7)	
	Migration background, n (%) ^a				.370
	Yes	13 (10.4)	9 (12.5)	4 (7.5)	
	No	112 (89.6)	63 (87.5)	49 (92.5)	
	Urbanization, n (%)				.011
	Rural (≤20.000 inhabitants)	73 (58.4)	35 (48.6)	38 (71.7)	
	Uurban (>20.000 inhabitants)	52 (41.6)	37 (51.4)	15 (28.3)	
	Health insurance, n (%) ^a				.038
	Statutory	101 (80.8)	63 (87.5)	38 (71.7)	
	Private	24 (19.2)	9 (12.5)	15 (28.3)	
Clinical variables	DUI, M in months (SD); Md, (Q1, Q3) ^b	12.0 (20.8); 6.0 (2.3, 11.3)	17.1 (26.0); 7.62 (4.3, 17.4)	5.1 (5.0); 3.2 (1.3, 7.8)	<.001
	AOO, Min years (SD); Md, (Q1, Q3) ^b	17.8 (3.6); 17.0 (15.0, 20.0)	20.0 (3.2); 20.0 (18.0, 21.8)	14.8 (1.1); 15.0 (14.0, 16.0)	<.001
	Diagnosis (DSM-5), n (%)				.144
	Full threshold anorexia nervosa	101 (80.8)	55 (76.4)	46 (86.8)	
	Subthreshold anorexia nervosa	24 (19.2)	17 (23.6)	7 (13.2)	
	AN subtype (DSM-5), n (%) ^a				.524
	Restrictive	108 (86.4)	61 (84.7)	47 (88.7)	
	Binge-purging	17 (13.6)	11 (15.3)	6 (11.3)	
	Setting “first AN treatment”, n (%)				.160
	Inpatient	75 (60.0)	47 (65.3)	28 (52.8)	
	Outpatient	50 (40.0)	25 (37.7)	25 (47.2)	
	BMI, M in kg/m ² (SD [range]) ^a	15.7 (1.9 [11.0, 21.2])	15.8 (1.9 [11.0, 20.5])	15.6 (1.9 [12.2, 21.2])	.577

TABLE 1 (Continued)

	Age group ^a			<i>p</i>
	Total sample (<i>n</i> = 125)	Adults (<i>n</i> = 72)	Adolescents (<i>n</i> = 53)	
EDE-Q8, <i>M</i> (<i>SD</i>), <i>Md</i> (<i>Q1</i> , <i>Q3</i>) ^{a,b}	4.7 (1.3); 5.1 (4.0, 5.8)	4.7 (1.3); 5.0 (3.8, 5.8)	4.8 (1.3); 5.3 (4.2, 5.7)	.597
Comorbid mental disorder, <i>n</i> (%) ^a				.037
None	32 (25.6)	13 (18.1)	19 (35.8)	
One or more	93 (74.4)	59 (81.9)	34 (64.2)	

Abbreviations: AN, anorexia nervosa; AOO, age of onset; BMI, body mass index; DUI, duration of untreated illness; EDE-Q8, Eating Disorder Examination Questionnaire 8.

^aVariables included as moderators in further analysis.

^bDifferences between adults and adolescents were calculated using simple *t*-tests for normally distributed, Mann–Whitney *U* test for not normally distributed variables and χ^2 -tests for categorical variables.

their training (7.1%). Three quarters had completed an additional curriculum in basic psychosomatic care.

3.2 | Comparison of perceptions of patients, relatives, and PCPs regarding FABIANA-checklist items

Generally high agreement (mean scores above four points across all three perspectives corresponding to being rated as “rather” or “strongly agree”) was achieved by FABIANA-checklist items that emphasize the importance of social support, for example, practical support in treatment initiation (Item 5) or encouragement to take up treatment (Item 6). Across all perspectives, the lowest scores were observed for Item 11 that describes that the treating PCP handled the patient's difficulties insufficiently.

Post hoc differences between the three perspectives were observed for nine items (Items 7–10, 12, 14–15, 17, see Table 2) which indicated a higher agreement between relatives and/or PCPs compared with the patients (with one exception—item 17 “I believed that undergoing psychotherapy is a sign of weakness” where patients more strongly agreed than relatives and PCPs). These items mainly concern the PCPs' role in the treatment initiation process. The PCPs and the relatives rated PCPs' competence generally higher and more strongly agreed that regular appointments with the PCP had been arranged than the patients did. Moreover, relatives agreed that they themselves had been informed about AN more strongly than the patients did (Item 7). Table 3 contains the comparisons of the FABIANA-checklist items from the perspective of patients, relatives, and PCPs.

3.3 | Associations of FABIANA-factors and control variables with the DUI

Among the control variables entered in the first block of the cox regression, belonging to the adult compared with the adolescent age

group was clearly associated with an increased risk for a longer estimated mean DUI in all three Cox regression models (patients, relatives, PCPs, see Table 3). Migration background, insurance status, BMI, comorbidity, AN-subtype, and eating disorder pathology were not clearly related to the average DUI (see Supporting information S1). In each of the three perspectives (patients, relatives, and PCPs), a different FABIANA-checklist item proved to be relevant.

3.3.1 | Patients' perspective

Higher values in Item 3 (“It helped me to look at or read articles regarding the successful treatment of anorexia or the recovery of other people with anorexia, e.g., books, reports, social media.”) were associated with a 1.45-fold increased chance for a shorter DUI ($p = .046$).

3.3.2 | Relatives' perspective

Patient's relatives reporting higher values in Item 11 (“The patient had a doctor who dealt badly with the difficulties concerning food, body-shape or weight, e.g., did not take complaints seriously or trivialized them”) was associated with a 0.15-fold increased risk for a longer DUI ($p = .037$).

3.3.3 | PCP's perspective

PCPs reporting higher values in item 12 (“After my patient's anorexia was recognized she had regular appointments with a doctor [e.g., family doctor, gynecologist, psychiatrist]”) was associated with a 0.40-fold increased chance for a shorter DUI ($p = .018$).

Table 3 contains the results of the variables included in the three final cox regression models. For complete presentation of results, see Supplementary File S1).

TABLE 2 Comparison of the FABIANA-checklist items between the perspective of patients (a), relatives (b), and PCPs (c).

FABIANA-checklist items	Patients, N = 125 (a)		Relatives, N = 89 (b)		PCPs, N = 40 (c)		Kruskal-Wallis		Mann-Whitney U	
	M	SD	M	SD	M	SD	H	p	Direction	p
1 People from my social environment have never addressed my anorexia, or have done so too late	3.22	1.22	3.15	1.29	2.72	2.45	4.918	.086		
2 There was at least one person in my social environment who understood at an early stage of the illness that I needed professional help (e.g., from a doctor, a psychotherapist or a counseling center)	3.51	1.39	3.75	1.42	3.79	1.10	2.048	.359		
3 It helped me to look at or read articles regarding the successful treatment of anorexia or the recovery of other people with anorexia (e.g., books, reports, social media)	3.11	1.30	3.19	1.11	3.02	0.26	.525	.769		
4 My social environment often expressed concern about my anorexia	3.88	1.15	3.90	1.17	3.83	0.05	.231	.891		
5 At least one person from my social environment supported me practically in treatment initiation (e.g., arranged or accompanied me to medical appointments)	4.31	1.21	4.54	1.09	4.33	1.07	4.646	.098		
6 My environment has encouraged me to take up treatment	4.33	0.92	4.61	0.86	4.63	3.50	9.982	.007	a < b a – c b – c	.003 .088 .395
7 My relatives or persons I relate to closely informed themselves on the subject of anorexia (e.g., read books, researched on the internet, visited a counseling center or a doctor)	3.65	1.35	4.40	1.05	4.00	9.71	20.582	<.001	a < b a – c b > c	<.001 .208 .014
8 I had a doctor who arranged that I received appropriate treatment	3.35	1.54	3.81	1.39	4.17	5.82	10.244	.006	a < b a < c b – c	.030 .004 .212
9 I had a doctor who recognized my anorexia at an early stage of the illness	2.50	1.39	2.80	1.48	3.38	5.94	11.555	.003	a – b a < c b < c	.155 <.001 .034
10 I had a doctor who told me unambiguously that I had anorexia	2.94	1.58	3.35	1.63	3.99	7.09	13.874	<.001	a – b a < c b – c	.052 <.001 .045
11 I had a doctor who dealt badly with my difficulties concerning food, body-shape or weight (e.g., did not take my complaints seriously or trivialized them)	2.41	1.39	2.48	1.49	1.92	2.46	2.451	.294		
12 After my anorexia was recognized, I had regular appointments with a doctor	3.47	1.58	4.34	1.07	4.28	12.62	21.585	<.001	a < b a < c b – c	<.001 .006 .468
13 I had a doctor I trusted	3.49	1.45	3.66	1.19	3.69	0.59	.313	.855		
14 I had a doctor with high competence in the field of eating disorders	2.57	1.31	3.15	1.37	3.04	5.74	11.279	.004	a < b a < c b – c	.002 .021 .594
15 I had a doctor who collaborated well with my other practitioners	2.58	1.45	3.02	1.33	3.55	8.22	15.698	<.001	a < b a < c b < c	.016 <.001 .041
16 It was difficult for me and/or my relatives or persons I relate to closely to find out whom I could consult best to get help	3.24	1.30	3.38	1.31	3.05	.95	2.288	.319		
17 I believed that undergoing psychotherapy was a sign of weakness	2.96	1.40	2.51	1.28	2.43	4.18	8.570	.014	a > b a > c b – c	.015 .021 .631

TABLE 2 (Continued)

FABIANA-checklist items		Patients, N = 125 (a)		Relatives, N = 89 (b)		PCPs, N = 40 (c)		Kruskal–Wallis		Mann–Whitney U	
		M	SD	M	SD	M	SD	H	p	Direction	p
18	By comparing with girls or women in the media (e.g., television, internet, social media) I considered a certain diet (e.g., a very restricted diet), a very slim figure or a very low weight to be normal so that I did not feel the need for treatment	3.64	1.30	3.45	1.31	3.40	1.18		.373		

Note: FABIANA-checklist items were rated on a 5-point Likert scale from 1 = “strongly disagree” to 5 = “strongly agree”. Group differences were tested with the Kruskal–Wallis Test for nonparametric data. In case of global p -value < .005, pairwise Mann–Whitney U tests were performed.

Abbreviations: FABIANA, Facilitators and barriers in anorexia nervosa treatment initiation; PCPs, primary care practitioners.

4 | DISCUSSION

This study quantified the impact of modifiable factors influencing the DUI from the perspective of patients, their relatives, and their PCPs, under consideration of a priori selected nonmodifiable control variables. The key insight of the study is that three modifiable factors proved to be clearly associated with the DUI. Watching or reading articles about the successful treatment or the recovery of other people with anorexia (patients' perspective), and regular appointments with a doctor on patients' pathway into treatment (PCPs' perspective) were clearly associated with a shorter DUI. The patient's DUI was found to be longer, the stronger the relatives agreed that the patient's PCP dealt badly with the difficulties concerning eating, body shape, or weight, did not take the patient's complaints seriously or trivialized them.

From our point of view, the first factor concerning information about the successful treatment or recovery of other patients with AN is particularly relevant, as it reflects the patient perspective and has so far rather been neglected. Studies on the use of social contact interventions to reduce stigma (Evans-Lacko et al., 2013) and on attitudes about mental illness (Wahl et al., 2012) point to a similar direction.

The clear association of regular appointments with a doctor and PCPs' helpful handling of patients' difficulties is in line with previous studies pointing to the importance of PCPs in the process of treatment initiation. General practitioners and pediatricians play the most important role in first diagnosing AN and informing patients about treatment facilities (Mond et al., 2008; Neubauer et al., 2014; Treasure et al., 2021). At the same time, there appears to exist a lack of competence in the field of early detection, motivation, and referral of patients with AN (Demmler et al., 2020; Higgins & Cahn, 2018; Homan et al., 2019; Hudson et al., 2013; Linville et al., 2010; Waller et al., 2014). PCP who offer regular appointments might engage in a particularly active management of AN, by monitoring the patient's weight progress and helping to bridge eventual waiting times for specialized care.

It should be added here, that the FABIANA-checklist item describing that the PCP dealt badly with the patient's complaints, or did not take them seriously, did on average “rather not” apply. That means most PCPs were able to helpfully deal with patients' difficulties

from the perspective of the patients and their relatives. Nevertheless, it seems worthwhile to consider this factor when designing and implementing secondary prevention strategies as this factor when assessed by relatives proved to be associated with the patients' DUI.

Another interesting result is that the PCPs and/or relatives rated the presence of different competencies of PCPs in the process of diagnosing AN, dealing with the difficulties, informing, motivating, and referring patients higher than patients did. It might be worthwhile to raise awareness that patients might have discrepant or less intense perceptions of helpful factors and to explore the reasons for discrepancies in future research.

4.1 | Strengths of the study

A main strength of the study is the multi-informant, multimethod approach which allowed us (a) to combine inductive (bottom-up) with deductive reasoning, (b) to examine factors being associated with treatment initiation from three different perspectives (patients, relatives, and PCPs), (c) to include a diverse range of factors, and (d) to focus on those factors that are modifiable through preventive interventions. As recruitment was conducted at 11 sites, we were able to recruit a substantial sample of patients with AN, although patients in first treatment constitute a small proportion of all treated patients, not all eligible patients agree to participate and recruitment occurred during the Coronavirus disease 2019 (COVID-19) pandemic, during which many eating disorder facilities had to reduce or even close their treatment services. With an average BMI of 15.71 kg/m² and a mental comorbidity rate of 74.4%, the analyzed population is comparable to other studies (Godart et al., 2007; Kästner et al., 2018; Zeeck et al., 2018).

4.2 | Limitations of the study

One of the main limitations of our research is the small sample size of PCPs and relatives. Not all patients consented to contact their PCPs; either because they had not been to a PCP before taking up specialized care, or they had no particular bond or even conflicts with their PCP (e.g., about accepting an AN-diagnosis or a recommended

TABLE 3 Cox regression on association of FABIANA-factors and control variables with the duration of untreated illness (DUI).

Variables	Patients (N = 125)						Relatives (N = 89)						PCPs (N = 40)								
	-2LL		χ^2	HR	SE	95% CI	p	-2LL		χ^2	HR	SE	95% CI	p	-2LL		χ^2	HR	SE	95% CI	p
Block 0		964.71							627.96							220.76					
Block 1		943.04	20.42						612.42	16.21						209.11	13.07				
Age (adult)				-0.858	0.195	0.289, 0.621	<.001				-0.927	0.238	0.248, 0.630	<.001				-1.314	0.385	0.126, 0.571	<.001
Block 2		941.98	24.85						607.93	20.74						202.259	18.24				
Age (adult)				-0.820	0.196	0.300, 0.646	<.001				-0.888	0.237	0.259, 0.655	<.001				-1.523	0.409	0.098, 0.486	<.001
Item 3				0.145	0.073	1.003, 1.333	.046														
Item 11											-0.147	0.070	0.752, 0.991	.037							
Item 12																		0.395	0.167	1.070, 2.060	.018

Note: Cox-regression models showing all variables, which entered the respective model through backward selection. DUI was used as time elapsed until the occurrence of the event (initiation of specialized treatment). Block 1 comprises moderating variables (age, urbanization, health care status, comorbidity, BMI, and social support). Block 2 comprises 18 FABIANA-checklist items. Models were calculated for the perspective of patients, relatives, and PCPs separately. p -values for $\alpha = 5\%$ with two-sided testing. For complete presentation of results, see Supplementary File S1. Item 3: "It helped me to look at or read articles regarding the successful treatment of anorexia or the recovery of other people with anorexia (e.g., books, reports, social media)"; Item 11: "I had a doctor who dealt badly with my difficulties concerning food, body-shape or weight (e.g., did not take my complaints seriously or trivialized them)"; Item 12: "After my anorexia was recognized, I had regular appointments with a doctor." Abbreviations: -2LL, log-likelihood ratio; 95% CI, confidence interval, lower and upper values; BMI, body mass index; FABIANA, Facilitators and barriers in anorexia nervosa treatment initiation; HR, hazard ratio; SE, standard error; PCPs, primary care practitioner; χ^2 , Chi²-test.

treatment). As patients without versus with participating PCPs did not differ relevantly with regard to BMI, diagnosis, DUI, comorbidity, or age there is a low probability of a selective choice. As for the PCPs, their low response rate may be due to the coincidence of recruitment with the COVID-19 pandemic and PCPs' even more limited time resources to participate in a comprehensive study. The low participation rate of PCPs should also be taken into account when interpreting our result that from the PCPs' perspective regular appointments with a doctor on patients' pathway into treatment was a facilitator. This result should be replicated in future studies with larger sample sizes of PCPs, also to potentially identify other factors influencing the DUI from the PCP perspective. These studies should also take into account that patients with AN might have contacts with different PCPs during their illness course, and some of the involved PCPs might miss diagnosing AN appropriately or recommending appropriate treatment. This consideration of the whole treatment history was beyond the scope of this study, but might be regarded as a confounder of our results.

The mean DUI in our sample was about 1 year (only 11 patients had a DUI >2 years, 5 patients >5 years) which is relatively short in comparison to previous international reviews (Austin et al., 2021).

Moreover, it has to be mentioned that migration background in our sample only refers to participants with migration background who have sufficient knowledge of the German language (see exclusion criteria). Our data, of course, do not allow conclusions about the success of treatments. However, other studies have repeatedly shown that a short DUI is associated with better treatment outcomes (Andres-Pepina et al., 2020; Austin et al., 2021; Fernandez-Aranda et al., 2021; Treasure et al., 2021). Additionally, all patients in our sample underwent psychotherapy, which means that our results are only applicable to patients who ultimately decided to undergo therapy. Differing results might be found in affected persons who decided not to initiate treatment. Recruitment in this group would be, however, extremely challenging.

The AOO and the FABIANA-factors were assessed retrospectively, which may have led to memory biases. However, to reduce a recall bias, we used anchor examples, marking relevant events in the patients' life on the patient's timeline. During the clinical interviews, the interviewer repeatedly referred to this timeline in order to support patients in recalling their symptoms at a given time point. Moreover, mainly adolescent patients, used apps to track their weight curves. Thus, they could give exact information at what time point the weight criteria for AN-diagnosis were met. Another measure to limit recall biases, was to assess data from patients who had their first treatment within the last 12 months (Bhandari & Wagner, 2006; Dalziel et al., 2018). A prospective assessment of our research questions was not feasible, due to the low prevalence of AN within the general population. We focused only on female patients with AN due to the particularly low prevalence of AN within males. This decision enhanced the homogeneity within our study population at the cost that our results cannot be generalized to male patients with AN.

Finally, it is important to underline that our findings apply to the German health care system, which is characterized by PCPs having a

gatekeeper function, a coverage of psychotherapy by both statutory and private health insurances and, when compared internationally, a wide range of inpatient and day-patient wards specialized in eating disorders with treatment durations between 6 and 12 weeks (Tikkanen et al., 2020). We are confident, however, that the results are relevant beyond Germany as other Western health care systems share similarities (e.g., the role of the PCP or the importance of relatives in the process of treatment initiation).

4.3 | Recommendations for the conception of secondary prevention strategies

It seems worthwhile to address these three relevant FABIANA-factors in future refinements of secondary prevention measures. First, we recommend to develop media contributions about successful therapies as key element in future secondary prevention strategies and to develop appropriate material in the form of real or re-enacted patient reports, texts, video-clips, or treatment diaries. These materials should be available in social media, for self-help groups, in counseling centers, schools, waiting rooms, prevention programs at schools and should include detailed information about factors, which proved to be helpful on the way to specialized AN treatment and in the process of treatment and recovery.

Second, we further recommend to train PCPs via e-learning or skills training, on diagnosing eating disorders, dealing with patients' symptoms and complaints, and accompanying their ambivalent treatment motivation. Physicians and medical residents admit their lack of experience in diagnosing and managing eating disorders and express their need for more training (Reid et al., 2010). Beside conventional trainings, it might be worthwhile offering PCP's trainings of interpersonal skills, which have been effective in helping psychotherapists to recognizing and manage challenging situations (alliance ruptures) with patients (Anderson et al., 2020; Eubanks-Carter et al., 2015; Gumz, 2020; Gumz et al., 2020). Screening tools might be helpful to further enhance the early detection of AN disorders in primary health care (Feltner et al., 2022).

Third, we recommend to inform PCPs about the benefits of an active management with provision of regular appointments following diagnosis and support on patients' pathway into specialized treatment (Waller et al., 2014).

AUTHOR CONTRIBUTIONS

Antje Gumz: Conceptualization; funding acquisition; investigation; methodology; project administration; supervision; validation; writing – original draft; writing – review and editing. **Laurence Reuter:** Data curation; formal analysis; investigation; project administration; writing—original draft; writing—review and editing. **Bernd Löwe:** Conceptualization; funding acquisition; resources; supervision; writing—review and editing. **Ulrich Voderholzer:** Resources; writing—review and editing. **Bianca Schwennen:** Resources; writing—review and editing. **Helge Fehrs:** Resources; writing—review and editing. **Wally Wünsch-Leiteritz:** Resources; writing—review and editing. **Romuald**

Brunner: Resources; writing—review and editing. **Denise Kästner:** Conceptualization; methodology; writing—review and editing. **Antonia Zapf:** Methodology; supervision; writing—review and editing. **Angelika Weigel:** Conceptualization; data curation; project administration; writing—review and editing.

ACKNOWLEDGMENTS

We wish to thank all our partners for their cooperation. For their support in recruiting the patients: C. Grosche und T. Lommer, M. Emmerich Schön Klinik Roseneck, Prien am Chiemsee; V. Maicher, Asklepios Klinikum West Hamburg; A. Reich (later Stahmer), Asklepios Klinikum Nord-Ochsenzoll Hamburg; Dipl. Psych. S. Schubert, Dipl. Psych. M. U. Bayer, Dipl. Psych. C. Moderhak, Schön Klinik Bad Arolsen; Dipl. Psych. S. Nowak, K. Glandl, Dr. med. C. Teckentrup, Schön Klinik Bad Bramstedt; Dr. Med. R. Albrecht, Schön Klinik Hamburg Eilbek, Hamburg; Dipl. Psych. S. Behrens, Curtius-Klinik, Fachklinik für Psychosomatik und Psychotherapeutische Medizin, Bad Malente; Dr. med. U. C. Haberer, Psychosomatische Klinik des Evangelischen Krankenhauses Ginsterhof, Rosengarten; S. Gerber, Universitätsklinikum Regensburg; J. Klier, Dr. Med. H. Berner, Dr. med. S. Meinel, Universitätsklinikum Heidelberg; Dr. phil. G. Zarbock, Ausbildungsinstitut für Verhaltenstherapie, Hamburg; R. Wessels, Institut für Moderne Verhaltenstherapie, Hamburg; J. Böhne, Ausbildungsinstitut für Verhaltenstherapie Falkenried, Hamburg; Dipl. Psych. A.-L. Kaufmann, Flensburg; Dipl. Psych. A.-L. Thomas, Hamburg; Dipl.-Psych. B. Matz-Knocke, Hamburg; Dipl.-Psych. M. Axhausen, Hamburg; Dipl.-Psych. S. la Roche, Hamburg. We would also like to thank the former and current members of our research group, research assistants, and students: Dr. Ines Buchholz, J. Schmidt, Cand. psych. B. M. Frank, A. L. Eßwein, E. Grandke. We also want to express special thanks to all patients, relatives, and primary care practitioners who supported the study with their participation. Finally, we would like to thank Abigail Smakowski for language review of this article. Open Access funding enabled and organized by Projekt DEAL.

FUNDING INFORMATION

The study was funded by the German Research Foundation (Deutsche Forschungsgemeinschaft [DFG]; GU 1564/3-1; LO 766/16-1, Principal Investigators: Antje Gumz and Bernd Löwe).

CONFLICT OF INTEREST STATEMENT

The authors had no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

All data are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

The study was reviewed and approved by the Ethics Committee of the Medical Chamber Hamburg, Germany (PV5108). Written informed consent was obtained from all study participants (patients, relatives, and PCPs). Additional written informed consent from a parent or legal guardian was obtained for patients under 16 years.

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How to cite this article: Gumz, A., Reuter, L., Löwe, B., Voderholzer, U., Schwennen, B., Fehrs, H., Wunsch-Leiteritz, W., Brunner, R., Kästner, D., Zapf, A., & Weigel, A. (2023). Factors influencing the duration of untreated illness among patients with anorexia nervosa: A multicenter and multi-informant study. *International Journal of Eating Disorders*, 56(12), 2315–2327. <https://doi.org/10.1002/eat.24069>