What characterizes outpatient nutrition therapy interventions for obesity? A survey of nutrition professionals in Germany

Part 1: Prior experience, interdisciplinary collaboration, monitoring tools and evaluation indicators

Janine Ehret, Nanette Stroebele-Benschop

Abstract

A survey of outpatient nutrition professionals (NPs) was conducted to provide insights into the type of interdisciplinary collaboration, the assessment of treatment success and potential improvements in the care of patients with obesity. The NPs surveyed (n = 130) stated that patients usually attempt to lose weight on their own over many years, and NPs support is typically sought only when the disease has reached an advanced stage. In addition to nutrition therapy interventions (NTI), NPs recommend exercise and behavioral therapy programs. The most urgent improvements were identified as the reduction of structural and financial barriers, as well as the expansion of the scope of treatment and multimodal treatment programs. The average effectiveness of NTI in reducing initial weight was estimated at approximately 5% or higher. To verify the NPs estimates with more robust evidence, standardized monitoring tools and evaluation indicators should first be established.

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Introduction

Guideline-based obesity treatment is based on a multimodal approach that combines nutrition and exercise therapy, behavior change, and medical care [1]. In Germany, such multimodal treatment programs are usually implemented through group-based patient education [2]. According to a recent review by Morgan-Bathke et al. [3], participants in multimodal treatment programs achieved an average weight loss of –4.9% of their initial weight compared to the control groups (standard care or no intervention). In addition, a significant reduction in waist circumference was observed [3]. In a few cases, multimodal programs have already been integrated into routine care (through special or interdisciplinary care in accordance with §140a SGB V), ensuring full cost coverage and allowing data on effectiveness to be collected outside of clinical studies [4].

A mean weight reduction of –4.0% of the initial weight was achieved after 72 weeks in patients with obesity class II and III participating in the multimodal Leipzig Obesity Program. Additionally, significant improvements in quality of life and depressive symptoms, as well as significant reductions in waist circumference and cardiovascular risk factors, were observed [4]. In an evaluation of comparable treatment programs (such as DOCWeight® 2.1 and M.O.B.I.L.I.S.), slightly greater weight reductions (–5.4% to –6.4%) were reported after 12 months [5].

Although this type of multimodal basic therapy is in line with national and international consensus [1, 6], it is not offered on a regular basis for various reasons [7, 8]. On the one

hand, participants must apply for cost coverage from their health insurance providers prior to the program, and approval is required. This may be subject to assessment by the medical service and decisions may vary among health insurance companies [2, 9]. On the other hand, a further problem is the lack of nationwide availability: There are approximately 40 centers across Germany offering guideline-based patient education programs, such as DOCWeight® and Optifast-52 [10, 11].

Measures to improve this situation are planned as part of the Disease Management Program (DMP) for patients with obesity [12]. Since 2019, digital health applications (*Digitale Gesundheitsanwendungen*, DiGAs) have been introduced to help address this gap in care [13]. With the use of DiGAs, weight losses of –2.3% (last observation carried forward [LOCF] imputation) respectively –2.9% (completers analysis) were observed over a 3-month application period compared to the control group [14]. Weight reductions of up to –7.8% (intention-to-treat [ITT] analysis) have been reported after one year [15]. However, current data indicate that follow-up prescriptions for DiGAs are rarely (<5% Oviva® direkt, 34% Zanadio®) issued [16].

Individual measures in the areas of nutrition, exercise, and behavior change are more widely available. Results from a survey of patients with obesity showed that 38.7% of patients receive no treatment at all, while 48% and 43% were undergoing nutrition therapy and psychotherapy[1], respectively, and 26% were undergoing physiotherapy [17]. A survey of healthcare professionals in the US found that only 15.1% of respondents always refer their patients with overweight and obesity to registered dietitians [18]. Similarly, in Germany, general practitioners appear to be more likely to give dietary recommendations themselves than to refer patients with obesity to nutrition and exercise specialists [19]. Nevertheless, overweight and obesity are the most common indications for nutrition counseling or therapy, accounting for approximately 90% of cases [20, 21]. Across Germany, 1,185 NPs are available to provide support for the indications of overweight and obesity [22–24]. However, multiple listings cannot be entirely avoided. Since it is not possible to conduct a location-independent, indication-specific search through two professional associations [25, 26], the actual number may be higher. Nutrition therapy for patients with obesity most often comprises about 5 sessions over a period of up to 6 months [20, 21]. Nutrition therapy for patients with obesity is not covered by health insurance, and patients are therefore advised to contact their health insurance provider in advance regarding the possibility of (partial) cost coverage (discretionary benefit/so-called "*Kann-Leistung*") [27]. The patient share of costs required might be another reason why the options for nutrition therapy are not yet being used more extensively, despite their increased availability [12].

Furthermore, NPs offer group-based primary prevention courses (e.g., "*ICH nehme ab*", a program developed by the DGE with 755 providers across Germany, consisting of 12 sessions lasting 90 minutes each), which adhere to the prevention principle of avoiding and reducing obesity and may be subsidized by statutory health insurance [28–30]. Patients with obesity class I are also eligible for participation and subsidies, if they have medical approval and no comorbidities requiring treatment [29, 30].

In addition to the multimodal programs mentioned above, Morgan-Bathke et al. [3] also analyzed 31 interventions delivered exclusively by NPs (dietitians or international equivalent). These interventions resulted in a slightly smaller but nonetheless significant reduction in body weight (–3.8%) and waist circumference, as well as significant reductions in systolic blood pressure and fasting blood glucose compared to the control group. No comparative analysis regarding the inclusion of physical activity was conducted [3]. Peuker et al. reported that almost all surveyed NPs indicated working in an interdisciplinary manner [21]. However, the specific types of collaboration with exercise and behavioral therapists remain unclear.

Based on an online survey, this study aims to provide indications of the current care situation for patients with obesity in Germany from the perspective of outpatient NPs. The survey addresses the following research questions:

1. Which approaches commonly precede the start of nutrition therapy interventions, and what degree of obesity do patients most commonly present with when they first seek care from NPs?
2. How is interdisciplinary collaboration implemented in the context of outpatient nutrition therapy interventions for obesity?
3. From the perspective of NPs, which changes are considered most urgent to improve care for patients with obesity?

In addition, the study will examine which monitoring instruments and evaluation indicators [31] are currently used to assess success and, thus, are available to demonstrate the effectiveness of nutrition therapy interventions (outcomes management [31, 32]) in day-to-day conditions. The study will further examine how NPs assess the average success of their patients with obesity and whether potential success factors can be derived exploratively based on the characteristics recorded. Overall, the study contributes to a better understanding of the current realities of outpatient care for patients with obesity provided by NPs and identifies areas for action that should be addressed prior to the as yet outstanding

[1] Psychotherapy can only be provided if there is an appropriate indication. According to the guidelines for the implementation of psychotherapy issued by the Federal Joint Committee (G-BA), obesity is not considered an indication fo psychotherapy.

demonstration of effectiveness of nutrition therapy interventions in day-to-day conditions.

Methods

Recruitment took place from August 2021 to January 2022 via the email distribution lists of professional associations (VDD, VFED, QUETHEB) and, alternatively, through direct contact with the expert pools of these associations. The study was further disseminated via newsletters issued by DGE, VDOE, and FET. Participation was also promoted through posts on social media platforms (Ernährungs Umschau, UGB).

Prior to data collection, the survey instrument was presented to several NPs for review and subsequently revised. The online survey was administered using Unipark (Tivian XI GmbH). The survey instrument consisted primarily of closed-ended items, supplemented by a semi-open response option ("Other, please specify"). Information regarding changes that are considered most urgently needed, reimbursement or subsidies, the use of follow-up care services, and estimates for assessing treatment success (excluding the percentage weight loss) was collected in an open-ended format. Based on the eligibility criteria for patient education programs, data were collected regarding the extent to which relevant comorbidities (coronary heart disease, stroke, type 2 diabetes mellitus, sleep apnea, or hypertension [2]) affected the availability or nature of treatment options offered.

In the context of obesity as a chronic disease, the term nutrition therapy is used exclusively in the following, rather than nutrition counseling. The survey was conducted considering all treatment options for patients with obesity provided by NPs in outpatient care (including nutrition therapy in individual settings [conservative or before/after obesity surgery], prevention courses, patient education). Accordingly, the generic term "nutrition therapy interventions (NTI)" is used throughout. Eligible participants were NPs working in the field of outpatient nutrition counseling/therapy with adult patients. During recruitment, no quotas were set regarding employment status (employed/self-employed/both employed and self-employed) or the type of degree held by the NPs surveyed. Therefore, no adjustment or stratification was performed during recruitment, resulting in widely varying group sizes. Accordingly, subgroup analyses were largely omitted. NPs without qualification as a dietitian or an academic degree (from university or university of applied science) with a clear nutritional focus (n = 5) and without a valid continuing education certificate from the aforementioned institutions (n = 3) were retrospectively excluded from the data set to improve comparability.

Data analysis was conducted using IBM SPSS 29. Results from the descriptive analyses are reported as relative frequencies (in %) or means with 95% confidence intervals (CIs). Where relative frequencies or means refer to a subpopulation or multiple responses (>100%), this is indicated accordingly. Differences in observed frequencies or central tendencies were assessed using Pearson Chi-square tests, Fisher's exact tests, and post hoc tests (Bonferroni correction). The significance level was set at $p < 0.05$.

Results

A total of 130 NPs were included in the analysis. Most respondents (66.2%) reported holding an academic degree (in oecotrophology, nutritional science, or similar). Slightly more than one quarter (26.9%) were dietitians, while 6.9% reported holding a nutrition-related bachelor's, master's, or diploma degree in addition to qualification as a dietitian. The most frequently reported degree was a diploma (50.0%). Two-thirds (66.2%) of respondents were between 45–65 years of age, while the remaining NPs were aged 19–44 years. Accordingly, 54.6% have been working in the field of nutrition counseling and therapy for more than 20 years, 22.3% reported 10–20 years of experience. Shorter professional experience was reported by 23.0% (<10 years: 9.2%; <5 years: 13.8%; discussed in more detail in Part 2). The average number of weekly working hours in nutrition counseling/therapy was 25.0 [23.0–27.0] hours. On average, approximately half (49.8%) of this working time was devoted to patients with obesity.

Two-thirds of respondents (67.7%) were self-employed at the time of the survey, 11.5% were employed, and 20.8% were both self-employed and employed. A total of 18.5% of NPs reported working in multiple settings or institutions (2 institutions: 16.2%; 3 institutions: 2.3%). 71.5% of the NPs surveyed worked in their own practice for nutritional counseling/therapy (n = 93). This was followed by medical care centers or outpatient clinics (9.6%, n = 12), obesity centers and outpatient rehabilitation facilities (7.7% each, n = 10), physician practices (6.2%, n = 8), and health insurance providers (5.4%, n = 7). The patients' average body mass index (BMI) at the start of outpatient NTIs was most frequently (46.9%) reported in the range of obesity class II (obesity class I: 31.5%; obesity class III: 21.5%). On average, patients had attempted 6 self-directed weight loss approaches (5.8; 95% CI: 5.4–6.2) before consulting NPs. The most common approaches include various diets (96.2%), Weight Watchers and intermittent or total fasting (89.2%), meal replacement with formula products (80.8%), accompanied metabolic diets (e.g., blood type diet, 67.7%), and residential stays at rehabilitation clinics for weight loss (50%). A total of 79.2% of respondents indicated that their patients had been trying to lose weight on their own for at least 5–10 years before starting NTI, and 50% of NPs reported that this period

was longer than 10 years (◆ Figure 1).
At the time of the survey, almost all NPs reported offering individual nutrition therapy (≥92.3%), and approximately one-third also provided this intervention in the context of bariatric surgery. Multiple responses were possible regarding the duration and subsidization of individual nutrition therapy. In most cases (≥84.6%), 5 sessions were eligible for partial reimbursement by statutory health insurance. About one fifth of NPs indicated that subsidies for 6–10 appointments were possible upon additional application. However, half of these noted that this applied only to specific health insurance providers. In addition, 26.9% stated that, under certain circumstances, full cost coverage of 5 sessions may also be possible (again, limited to specific health insurance providers, nutrition therapy by NPs employed directly by the health insurance providers, or cooperation agreements). Preventive courses were offered by approximately one third of respondents. Other formats (patient training with/without formula diets, individually tailored combinations of individual and group sessions) played a minor role (≤10.8%).
The majority indicated that treatment options and cost coverage do not differ based on the presence of comorbidities (70.0%). However, in certain cases, additional nutrition therapy sessions are possible (e.g., through a further certificate of necessity in which the comorbidity is specified as an indication). Patients with obesity class I usually receive the same treatment as patients with higher classes of obesity (86.9%). Nearly all NPs reported that they motivate patients with obesity in a resource-oriented manner, encouraging them to resume sports and types of physical activity that they previously enjoyed and are currently able to perform (90.8%). Furthermore, they encourage patients to engage in behaviors and activities that have previously improved their well-being (83.1%). 23% of respondents stated that they cannot consider physical activity and exercise or behavioral therapy as part of NTIs. Recommendations and collaborations considered in the context of NTIs are shown in ◆ Table 1.
Regarding the most urgent changes needed to improve the care of patients with obesity, open-ended responses were provided by 83.1% of surveyed NPs (n = 108). Reducing financial barriers (specifically, decreasing out-of-pocket payments in favor of comprehensive and standardized reimbursement by health insurance providers, 49.1%) and structural barriers (such as earlier and more consistent referrals by general practitioners and specialists, 13.8%) was considered highly important. Additionally, 11.1% reported that the simplification of reimbursement procedures (e.g., by enabling direct and complete billing between health insurance providers and NPs solely based on a physician's certificate of medical necessity, without patient involvement) would constitute the most urgent improvement.
In addition, the extension of treatment scope and the expansion of outpatient multimodal treatment and follow-up care options were considered highly urgent: A total of 48.1% of respondents recommended a treatment scope of at least 10 nutrition therapy sessions or a treatment scope equivalent to that of individual psychotherapy. The expansion of outpatient therapy services through integrated, structured, and multimodal programs involving NPs was identified as the most urgent improvement for weight reduction and follow-up care (e.g., after rehabilitation) by 21.3% of respondents. Additional suggestions included greater consideration of comorbidities (e.g., lipedema) and psychological factors, increased opportunities for patient involvement in decision making, improved communication among healthcare providers, and options for timely support in the event of relapse.
Comprehensive nutrition and exercise protocols are used by most respondents for monitoring and evaluation purposes. Quality of life, satisfaction, and motivation (subject-oriented or patient-reported outcome measures, PROMs) are frequently reported as documented evaluation indicators. However, these measures were less often collected using validated questionnaires or scale-based assessments during treatment (◆ Table 2).
Of the NPs who do not perform NTI in the context of bariatric surgery (n = 83, 63.9%), 81.9% (n = 68) provided estimates of the percentage of weight loss achieved by their patients on average. A total of 13.2% (n = 9) reported that they did not achieve a clinically relevant weight loss of approximately 5% or more, while 48.5% (n = 33) indicated an average weight loss of around 5%, and 38.2% (n = 26) classified it at approximately 10% or higher. NPs who reported achieving a weight loss of approximately 5% or more were significantly more likely to use waist or hip circumferences and changes in cardiovascular or cardiometabolic risk factors as evaluation indicators. NPs who reported average weight

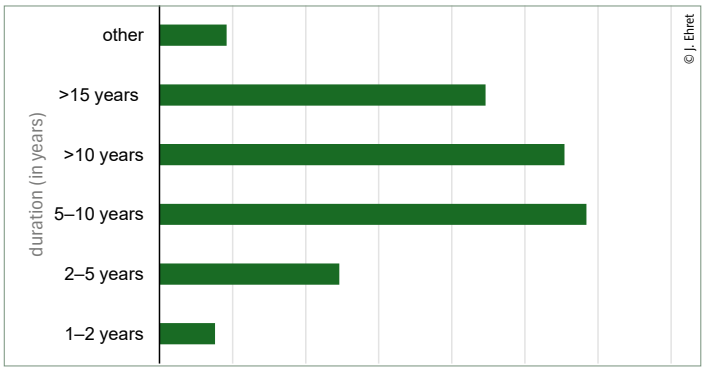

Fig. 1: **Average duration of self-directed weight loss approaches prior to the start of nutrition therapy interventions (n = 130)**
The category "other" includes responses such as "throughout life" and "varies greatly depending on age".

	Relative Frequency
Increase in Physical Activity	
a) In addition to nutrition counseling or therapy, I recommend my patients to participate in courses offered by adult education centers or in prevention programs in the field of physical activity that are listed by the ZPP.	**51.5%**
b) I recommend that my patients ask their general practitioner to prescribe a digital health application (DiGA, e.g. Videa® *bewegt*).	**3.8%**
c) I recommend that my patients ask their general practitioner to prescribe rehabilitation exercise ("*Rehasport*"), if there is a comorbid condition that qualifies as an indication for rehabilitation exercise.	**60.0%**
d) Our team is/I am interdisciplinarily qualified, and nutrition counseling/therapy for patients in our facility is linked to physical activity and exercise sessions (e.g., conducted by sports and exercise instructors or similar professionals).	**10.0%**
e) I cooperate/our institution cooperates with a fitness center and/or offers physical activity and exercise programs in collaboration with appropriately qualified professionals.	**16.9%**
Behavior Change	
a) In addition to nutrition counseling or therapy, I recommend my patients to participate in courses offered by adult education centers or take part in prevention programs in the field of relaxation that are listed by the ZPP.	**35.4%**
b) I recommend that my patients ask their general practitioner to prescribe a digital health application (DiGA, e.g. Selfapy®).	**2.3%**
c) I recommend that my patients ask their general practitioner to prescribe psychotherapy, if there is a comorbid condition that qualifies as an indication for psychotherapy.	**55.4%**
d) Our team is/I am interdisciplinarily qualified, and nutrition counseling/therapy for patients in our facility is linked to sessions in the field of behavioral therapy (e.g., provided by psychologists).	**16.9%**
e) I cooperate/our institution cooperates with behavioral therapists and/or offers behavioral therapy services in collaboration with appropriately qualified professionals.	**15.4%**

Tab. 1: **Consideration of preventive and therapeutic options for increasing physical activity and behavior change in NTIs for patients with obesity (n = 130) (multiple responses possible)**
DiGA: digital health application, NTI: nutrition therapy intervention; VHS: adult education center; ZPP: Central Testing Center for Prevention

loss of less than approximately 5% indicated significantly more often that aspects of exercise therapy cannot be considered in the context of NTI (44.4% vs. 13.6%).

Discussion

Which approaches precede an NTI, and what degree of obesity do patients most commonly present with when they first seek care from NPs?

The NPs surveyed reported that patients typically try to reduce their body weight over several years, often decades, without professional support and, in most cases, first seek support from NPs when their BMI is ≥35 kg/m². In the study by Caterson et al., most respondents (57%) indicated that at least three years had passed during which they struggled with their weight but did not discuss it with their general practitioner (3–5 years: 24%, 6–10 years: 16%, >10 years: 17%). Only 21% reported that, when the issue of weight was discussed, further conversations about weight followed [34]. Qualitative results from a survey of patients with obesity in German general practices concluded that, if weight was addressed by the general practitioner at all, it tended to be discussed incidentally [19]. The frequent self-directed weight loss attempts reported by NPs (on average 6 approaches) are consistent with results from earlier studies [34, 35]. Most of the approaches reported did not include evidence-based options.

This is not surprising given the much greater availability of questionable weight loss offers compared to evidence-based treatment options for many years [36]. In addition, it has been criticized that referrals to professional support services are too vague [19], which may contribute to delayed support from NPs. This is consistent with the improvements to patient care suggested by NPs (see below). While these findings are not unexpected, they remain alarming, as both the duration and severity of obesity are associated with an increased risk of comorbidities [1, 37, 38]. Earlier initiation of obesity therapy could, among other measures, be promoted by comprehensive awareness-raising efforts and by providing further training for general practitioners in nutritional medicine.

How is interdisciplinary collaboration implemented in the context of outpatient NTI, and which changes are considered most urgent to improve care for patients with obesity from the perspective of NPs?

	Relative Frequency
Regularly Used Instruments for Data Collection (Monitoring Tools)	
providing instructions to record dietary intake and physical activity using a structured template over several days, including documentation of emotions, situational factors and reasons for eating	**86.2%**
providing instructions to record dietary intake and physical activity using a structured template over several days	**57.7%**
providing instructions to record dietary intake and physical activity using nutrition apps over several days (e. g. FDDB®, MyFitnessPal®, Yazio®)	**32.3%**
providing instructions to record dietary intake using the food pyramid or the "What I eat" (*Was ich esse*) app provided by *Bundeszentrum für Ernährung* (BZfE) over several days	**36.9%**
conducting 24h recalls	**40.0%**
analyzing dietary records using computer-assisted methods	**46.9%**
analyzing dietary records using the food pyramid of the "What I eat" (*Was ich esse*) app provided by BZfE (without computer-assisted nutrient analysis)	**27.7%**
utilization of validated questionnaires to assess various dietary behaviors or eating disorders	**20.0%**
utilization of validated questionnaires to assess quality of life, satisfaction, motivation/readiness to change, self-efficacy or perceived stress (e.g. short form [SF]-36 Health Survey, EUROHIS-QOL)	**11.5%**
assessing quality of life, satisfaction, motivation/readiness to change, self-efficacy or perceived stress using scales	**38.5%**
Parameters Used to Assess Treatment Success (Evaluation Indicators)	
1. health status outcomes **a) anthropometic parameters**	
body weight and body mass index	**9.4%**
waist-/hip circumference	**62.3%**
body composition (e.g assessed by BIA)	**45.4%**
b) changes in cardiovascular or cardiometabolic risk factors[a]	
lipid profile (total cholesterol, LDL, HDL, triglycerides)	**69.2%**
blood pressure	**67.7%**
fasting blood glucose and HbA1c	**66.2%**
liver-specific parameters (ASAT, ALAT and GGT)	**55.4%**
2. subject-oriented outcomes (patient-reported outcome measures, PROMs)	
changes in quality of life, satisfaction, or motivation	**93.1%**
changes in physical performance (e.g. assessed using the Borg scale)	**9.2%**
3. direct nutrition-related outcomes[b]	
changes in health behaviors assessed through dietary intake and physical activity records	**83.1%**
Index (mean of commonly used parameters)	**7 (6.8)** **[6.2–7.0]**

Tab. 2: **Utilization of monitoring instruments and evaluation indicators in outpatient Nutrition Therapy Interventions (n = 130)**
ALAT: alanine aminotransferase; ASAT: aspartate aminotransferase; BIA: bioelectrical impedance analysis; GGT: gamma glutamyltransferase
Notes: Outcome categorization according to [32, 33]. Health-economic outcomes were not assessed but added by one NP through as a comment ("changed/reduced medication, e.g. for hypertension or pain management").
[a] Four nutrition professionals reported that measurement of laboratory parameters requires assessment by the patients general practitioner, which is not always available.
[b] additional open responses: measurement of the HOMA index (n = 1), measurement of changes in self- or body acceptance (n = 2), improvement in skills, sleep quality, and various forms of satisfaction (n = 1)

More than half of the respondents reported that, in the presence of corresponding comorbidities, they recommend that general practitioners prescribe exercise and behavioral therapy options in parallel with NTI. For one-sixth of the respondents, NTIs were linked to exercise and behavioral therapy sessions or implemented through cooperation (◆ Table 1). Collaborations with psychotherapists and physical therapists were more frequently reported by Peuker et al. [21]. Nearly half and a quarter of the NPs surveyed in that study reported diabetes mellitus and cancer, in addition to obesity, as indications for NTI. Since structured DMPs have already been established for these indications, it is assumed that psychosocial support within the framework of

these programs, which may also include the possibility of psychotherapy, can explain the more frequent collaborations reported by Peuker et al. [39, 40].

This also applies to diabetes and rehabilitation exercise groups recommended within this context [39]. The absence of such structured programs for patients with obesity may also contribute to the frequently mentioned resource-oriented counseling regarding opportunities for self-directed increases in physical activity and behavioral modification. In a study by Wangler and Jansky, about one-third of patients with obesity reported that recommendations for increasing physical activity were also addressed by their general practitioner [19]. However, recommendations regarding frequency and intensity were rarely provided, suggesting that the recommendation offered by NPs may represent an important, and sometimes possibly the only, reference to professional services in this area.

The most urgent improvement identified was the complete and standardized reimbursement of outpatient NTI by health insurance providers. The fact that financial costs constitute a barrier to successful obesity therapy has been consistently reported by other healthcare professionals and affected patients [34]. In a survey conducted at almost the same time, 68% of NPs indicated that, despite medical indication, patients do not make use of nutrition counseling services because they are either unable or unwilling to pay the required out-of-pocket costs [41]. In addition, a significant expansion of the scope of treatment was demanded. The strongly emphasized need for an expansion of multimodal treatment options for weight loss and follow-up care aligns with the conclusion of the guideline commission that "(integrated) care services for people with obesity in the German healthcare system are clearly lacking" [1].

According to a meta-analysis of lifestyle interventions, achieving weight loss of >5% requires more than 28 treatment sessions [42], which supports the suggestions made by EF, and underscores the need for evidence of effectiveness. Existing evidence of the effectiveness of multimodal treatment approaches in day-to-day conditions further substantiates this demand and indicates a promising cost-benefit ratio [4, 5]. Additionally, the importance of earlier referrals by physicians is emphasized. This finding is consistent with other studies: Patients trust their general practitioner, desire a proactive approach to the topic of weight loss, and most commonly consult NPs upon medical referral [19, 20, 34]. Furthermore, patients expressed a desire for structured nutrition or exercise programs and referrals to support services, as well as the perception that programs recommended by general practitioners would be more likely to be accepted than other treatment options [19].

In conclusion, it should be noted that the integration of outpatient NTIs into a multimodal treatment approach is currently not ensured. However, NPs consistently support corresponding changes in line with national and international recommendations.

Which monitoring instruments and evaluation indicators are used in outpatient NTI, and how do NPs assess the average success of their patients?

While the assessment of dietary and physical activity patterns very often includes the "emotions and functions associated with food intake" [1, p. 53], as recommended, PROMs based on validated questionnaires or recorded using scale-based assessment are used less frequently during NTIs. In contrast, PROMs are often used as evaluation indicators (◆ Table 2). Regarding evaluation indicators, unlike in the case of monitoring, no further inquiry was made concerning the specific instruments used, as consistency was assumed. According to Zbären et al., it can be assumed that PROMs such as quality of life are often assessed regarding evaluation using spontaneously formulated or repeated verbal questions [43]. Data from Peuker et al. support this assumption, as in their study, evaluation was reported to be carried out verbally by 60% of respondents, whereas only 5.6% used evaluation forms [21]. In contrast, Frenzel et al. used validated instruments (EUROHIS QOL-8, PHQ-9) in the context of the multimodal Leipzig obesity program (also under real-world conditions) [4]. The laboratory parameters reported do not correspond with the results of Zbären et al. [43], presumably due to the different priorities of the surveys (gastrointestinal complaints vs. obesity). This assumption is further supported by the high concordance with the parameters analyzed by Frenzel et al. for proving the effectiveness of multimodal obesity treatment in day-to-day conditions [4]. For the evaluation within DMPs, the Federal Joint Committee (G-BA) recommends the following parameters: "death, weight loss, BMI, patient education, changes in dietary patterns, blood pressure, daily physical activity, physical training, prediabetes, and manifest type 2 diabetes mellitus" [44, p. 9]. Thus, the widespread availability of some frequently used evaluation indicators appears questionable.

Therefore, there is an urgent need for standardization and, if necessary, validation of measures used to evaluate changes in dietary behavior and physical activity [32]. Due to the current guideline, the use of already validated instruments for assessing PROMs, such as the PHQ-2 or SF-12 is recommended [1].

The estimated weight losses appear disproportionately high compared to the effects described by Morgan-Bathke et al. [3]. However, a study conducted in day-to-day conditions reported comparable outcomes: 54.2% of participants in a multimodal obesity program achieved weight loss of more than 5% within 6 months, while 25.5% achieved weight loss of 10% or higher [45]. In addition, a telemedicine program (also conducted under real-world

conditions) that included educational sessions (delivered by physicians/other health professionals), digital recording/tracking of dietary, and physical activity behaviors, as well as weekly feedback, enabled 62% and 82% of participants, respectively, to achieve a weight loss of >5% after 6 months.

Weight losses above 10% were achieved by 39% and 51% of participants, respectively, although the sample sizes (n = 55 and n = 35) were limited [5, 46]. An earlier study with a design and intensity similar to NTIs in an individual setting, also reported comparable weight loss magnitudes over a period of 12 months (weight loss of –6.6% and –9.1%, respectively; ITT and per protocol [PP] analysis) [47]. According to Johns et al., distinguishing between outcomes after 3–6 and 12–18 months may be crucial. Their review found that after 12–18 months, combination programs showed significantly higher weight loss compared to nutrition interventions, whereas no differences were observed at 3–6 months [48]. No conclusions can be drawn regarding the duration or differences between NTI in individual and group settings, as only overall analyses were possible due to multiple responses.

It can be assumed that slightly more than half of the patients received recommendations to initiate exercise and behavioral therapy. However, no information is available on how frequent patients adhered to these recommendations and participated in such programs. Therefore, it remains unclear whether the estimated weight loss should be interpreted in the context of findings from unimodal nutrition therapy studies or in the context of findings from combination studies.

One possibility for the systematic documentation of evaluation indicators, enabling the provision of evidence of effectiveness, is the *Adipositas-Patienten-Verlaufsdokumentation* (APV) by the University of Ulm [49]. In addition to health status outcomes (◆ Table 2), this tool allows for the recording of comorbidities and the number of completed nutrition therapy sessions as well as medical, exercise, and psychotherapeutic treatment sessions. PROMs and direct nutrition-related outcomes are currently not captured. However, as relevant goals of NTI [50], these outcomes are of great importance. For the documentation of direct nutrition-related outcomes, the nutrition diagnosis status based on PESR statements, in line with the G-NCP, is recommended [32]. These statements are used to systematically describe nutrition problems (P = problem, E = etiology, S = symptoms, R = resources/barriers) [51].

In this context, further research is needed to assess practicality, as well as to develop time-efficient and comparable documentation procedures and to provide comprehensive training for NPs. For PROMs such as quality of life, it is also recommended that evaluation indicators should be jointly defined by NPs in advance, based on current recommendations. Such efforts toward transparent quantification of real-world effectiveness are of utmost importance – not only to justify treatment costs, but also to distinguish evidence-based care from non-evidence-based interventions and to establish a potential basis for integrating NTIs into standard care, both as part of multimodal treatment programs and as supplementary measures. Compared to data from clinical studies, this approach offers advantages such as reduced bias in favor of highly motivated participants. Moreover, the effects of potential financial compensation for participation are eliminated [4].

Limitations

Overall, this study included a small and non-representative sample. It is presumed that predominantly motivated and engaged NPs participated. At the start of the survey, the number of participants was n = 220 (completion rate: 62.7%). Even at this early stage, there was a lower proportion of employed compared to self-employed NPs (17.3% vs. 57.7%), a trend that intensified by the end of the survey (11.5% vs. 67.7%). This introduces a risk of bias, which may limit the generalizability of the results to employed NPs involved in obesity therapy. In future studies, employed outpatient NPs might be better reached through targeted contacts with potential employers (e.g., obesity centers, health insurance providers). In addition, dietitians were underrepresented compared to NPs holding an academic degree, possibly further limiting the transferability of findings to the overall group of outpatient NPs. The results cannot be generalized to NPs without certificates from professional associations or the German Nutrition Society (DGE).

The validity of variables such as baseline BMI, the number and type of approaches undertaken before the start of outpatient NTIs, and the estimated weight loss is limited, as these are average estimates rather than intervention study data and should therefore be interpreted with great caution. As an additional limitation, the categories used for the estimation of weight loss on average ("approximately <5%", "approximately >5%", etc.) lacked complete discriminative precision. Regarding the most urgent improvement, it is assumed that a different mode of assessment (closed rather than open questions with subsequent categorization) and phrasing the question in plural form ("most urgent improvements" instead of "the most urgent improvement") might have led to greater approval rates. Furthermore, providing a ranking of predefined improvements according to perceived priority might have contributed to a more complete understanding. All data are based exclusively on self-reports, which should be considered when interpreting the findings. No survey was conducted among other professionals involved in outpatient obesity therapy. The inclu-

sion of general practitioners, nutrition medicine specialists, mental health professionals, specialists for physical activity, and patients with obesity in future surveys would provide a more comprehensive picture of current care.

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Disclosures on Conflicts of Interest and the use of AI
The authors declare that there are no conflicts of interest and that no AI was used in the preparation of this manuscript (except for translation purposes for the preparation of the English translation).

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