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Evaluation of the "DGE Quality Standard for Catering in Institutions for Older People"[1,2]

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Abstract

The objective of this study was to evaluate awareness, acceptance, implementation and effects of the "DGE Quality Standard (QSt) for Catering in Institutions for Older People." 590 institutions for older people with varying proportions of care-dependent residents took part in a national written survey. Extensive telephone interviews were carried out with a sub-sample of 75 catering managers. Two thirds of participating institutions were aware of the QSt; most of these had also implemented the QSt, at least in part, and regarded the QSt as helpful. Some criteria in the quality areas of "food" and "nutrients" were significantly more frequently fulfilled by the institutions which were aware of the QSt than by those which were not. All the surveyed criteria in the remaining quality areas were fulfilled by the majority of institutions, irrespective of their awareness of the QSt. The most frequently-mentioned effects of the implementation of the QSt were changes in the frequency of use of certain food groups, a greater number of choices and increases in the costs of goods and in resident satisfaction. The greatest obstacles to implementation of the QSt were costs and tight budgets, lack of time and lack of acceptance of certain food groups.
These results should serve as a basis for further development of the QSt.

Keywords: institutions for older people, catering, DGE Quality Standard, nursing home

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Introduction

As a result of demographic developments, an increasing number of older people live in inpatient institutions. As the number of very old people has continued to rise and the need for care in old age has continued to increase, traditional retirement homes where older people live in sheltered accommodation, have increasingly developed into so-called nursing homes, where old people are provided with long-term care. Based on current statistics provided by the *Statistisches Bundesamt* (Federal Statistical Office of Germany), 764,000 people – almost a third of those in need of care – were cared for in approx. 13,000 SGB XI-approved nursing homes in Germany at the end of 2013. Almost 11,000 of these institutions provide full-time long-term care; the remaining number offer exclusively short-term or part-time care. Almost all institutions (94%) care primarily for older people [1].

In 2013, 1 in 5 nursing home residents was in need of intensive nursing care (Care Level 3); almost two-thirds were severely limited in their ability to cope with everyday life [1]. These limitations are often accompanied by nutrition problems such as loss of appetite, difficulties in chewing and swallowing and the need for help when eating, which are in turn associated with a low consumption of food and a high risk of malnutrition [2–5].

In the ErnSTES Study, the largest German study on the nutritional situation of older people in institutions, 39% of the 773 participating residents suffered, at least occasionally, from loss of appetite, 24% from chewing difficulties and 8% from difficulties in swallowing. 55% needed help cutting up food

[1] This article is an abridged version of the chapter of the same name in the *Ernährungsbericht 2016* (Nutrition Report 2016) produced by the *Deutsche Gesellschaft für Ernährung* (DGE) (German Nutrition Society).

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into small pieces and 40% consumed, at least occasionally, conspicuously too little food. According to the Mini Nutritional Assessment (MNA®) 11% were suffering from malnutrition and 48% were at risk of malnutrition [6].

In order to allow a dietary intake of sufficient quantity, the needs and resources of residents must be taken into account in food provision, in addition to nutritional requirements. In contrast to catering provided e.g. in schools or work canteens, catering in institutions for older people includes all meals and snacks required for the entire day. Furthermore, residence in an institution for older people is usually on a long-term basis and lasts for the individual's entire remaining lifespan. Thus, catering faces particular challenges in this field.

In 2009, the "DGE Quality Standard for Catering in Institutions for Older People" (QSt), now in its third edition, was developed as part of the National Action Plan "IN FORM – Germany's National Initiative to Promote Healthy Diets and Physical Activity" [7]. The QSt aims to provide support for catering managers in institutions for older people and to give residents a choice of foods which meet individual needs and requirements.

Up until now, there has been no information about the dissemination/distribution/spreading of the QSt, about whether it is regarded as helpful by institutions and about how it has affected the quality of catering. The objective of this study, which was carried out as part of the *Ernährungsbericht 2016* (Nutrition Report 2016) and supported by the *Bundesministerium für Ernährung und Landwirtschaft* (BMEL) (Federal Ministry of Food and Agriculture), was to evaluate awareness, acceptance, implementation and effects of the QSt.

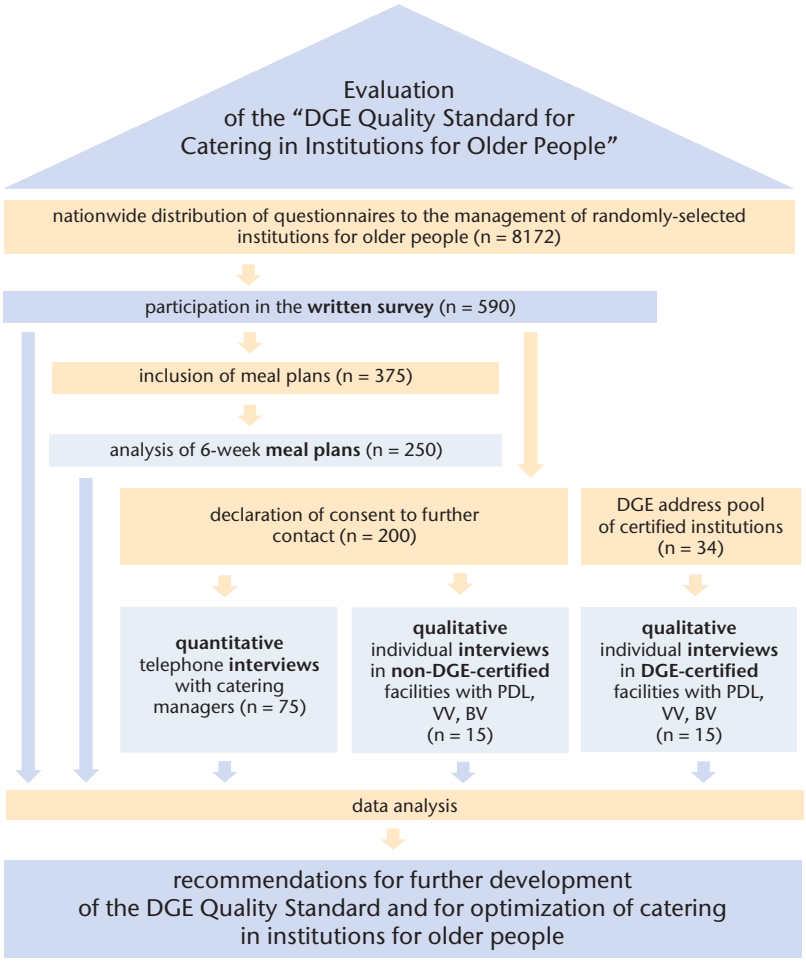

Fig. 1: **Process scheme and survey instruments for the nationwide research project to evaluate the "DGE Quality Standard for Catering in Institutions for Older People"**
DGE = *Deutsche Gesellschaft für Ernährung* (German Nutrition Society); PDL = *Pflegedienstleitung* (nursing management), VV = *Verpflegungsverantwortlicher* (catering manager), BV = *Bewohnervertreter* (resident representative)

Methods

The QSt was evaluated in four sub-projects using different survey instruments (◆ Figure 1). The following description is restricted to certain sections of the written survey and telephone interviews, owing to a lack of space. The full methodology is described in the *Ernährungsbericht 2016* (Nutrition Report 2016) [8].

In all sub-projects various characteristics of the institutions (including providers, number of full-time places) and catering structures (including kitchen operators, catering system) of the respective study collective were recorded.

Written survey

A nationwide written survey aimed to evaluate awareness and acceptance of the QSt as well as the implementation of individual criteria. A questionnaire was developed which comprised a total of 66 questions: 56 closed questions with given response options (including 14 yes/no questions) and 10 open questions (9 relating to numerical data and 1 with an open text response). The questionnaire was divided into the following themes: "structural characteristics" (8 questions), "organization of catering" (15 questions), "food choice" (14 questions), "meal

planning" (14 questions) and "quality and nutrition management" (15 questions). Respondents could complete the questionnaire on paper (4 DIN A4 pages) or online[3].
From an address database of 10,589 care institutions (97% of all German institutions for older people offering full-time long-term care, n = 10,949 [1]), a random sample of 5,000 institutions was invited to take part by post, and further 3,172 institutions were invited by email.

Telephone interviews

Of the 200 institutions which agreed to further contact by telephone in the written survey, 75 were randomly selected to take part in the standardized telephone survey. The interviews were carried out with the person responsible for catering in the institution (kitchen or household management) and lasted for 20 to 30 minutes.
The telephone survey recorded the respondent's awareness of the QSt, the effects and benefits of its implementation and any obstacles which had to be overcome.

Data analysis

Data was analyzed using standard methods of descriptive statistics. Comparisons were made between institutions which were aware of the QSt and those which were unaware of the QSt. Differences in categorical variables were tested for significance using Pearson's chi-squared test and Fischer's exact test. Participants with missing data were not taken into account. The significance level was determined at $p < 0.05$.

Results

590 institutions took part in the written survey, corresponding to 7.2% of the contacted institutions (n = 8,172) and 5.4% of all institutions for older people in Germany offering full-time long-term care (n = 10,949).
The institutions had 80 places on average (median value). 41% of institutions were privately owned and 58% were publicly owned or owned by non-profit organizations. Most institutions had their own kitchen (69%). The use of service companies of the provider (21%) and caterers (8%) were less common. The midday meal was produced by 82% in a mixed kitchen on site; 11% of institutions received delivery of hot meals and 5% used refrigerated or frozen meals which were delivered and finished on site.

Awareness and acceptance of the QSt

More than two thirds (68%) of participants in the written survey stated that they were aware of the QSt and most (61%) had either fully (16%) or partly (45%) implemented the QSt; 7% responded negatively to the question on implementation. 50% of those who were aware of the QSt (n = 403) stated that they became aware of it at a seminar or through continuing education. Other sources of information included trade journals (44%), the internet (33%), the DGE (32%), fairs (16%), colleagues (12%) and brochures (12%) (multiple responses permitted).
In the telephone interview, 60% of the 75 catering managers surveyed stated that they were familiar with the contents of the QSt; 56% had implemented it in full

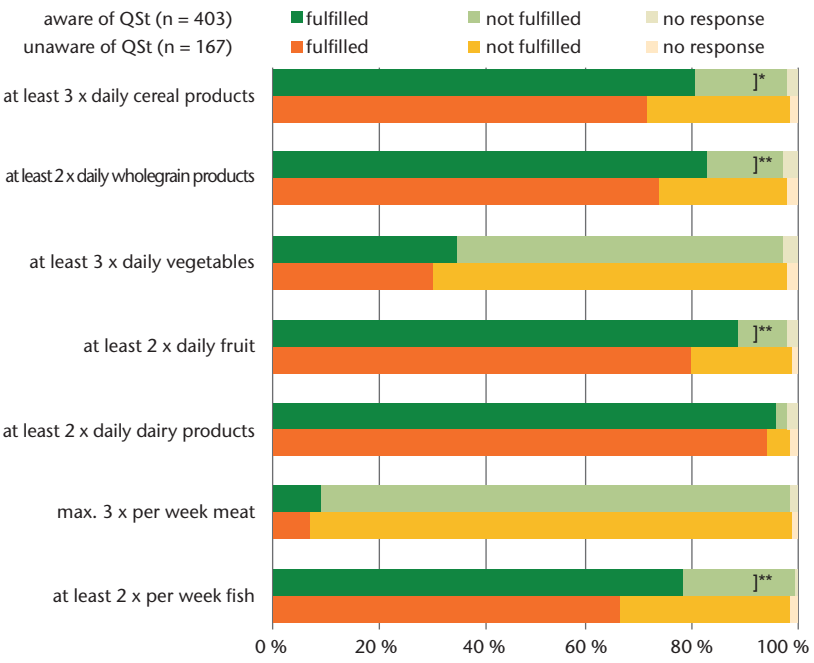

Fig. 2: **Compliance with the recommendations on the frequency of the provision of certain food groups in full-board catering and of meat at the midday meal (based on one full menu option according to the written survey, differentiated according to awareness of the quality standard [QSt])**
*p < 0.05; **p < 0.01; chi-squared test
Question on the frequency of the provision of food groups with 5 possible response categories (more than 3/3/2/1/less than 1 portions/day or week); meat provision with 7 response categories (from more than 5 to less than 1/week).

[3] Further information on the questionnaire is available from the authors.

(11%) or in part (45%). 40% stated that they were not familiar with the contents.

Implementation of individual aspects of the QSt

All of the following results on implementation relate to the written survey.

Quality area: food

◆ Figure 2 illustrates compliance with recommendations on the frequency of the provision of certain food groups, divided into institutions which were aware of the QSt and institutions which were not. Fruit and dairy products were provided in accordance with the recommendations by most institutions, yet the recommendations on vegetables and particularly on meat were largely not implemented.

Institutions which were aware of the QSt complied significantly more frequently with the recommendations on cereal products (80 vs. 71%, $p < 0.05$), wholegrain products (83 vs. 74%, $p < 0.01$), fruit (89 vs. 80%, $p < 0.01$) and fish (78 vs. 66%, $p < 0.01$) than institutions which were not aware of the QSt (◆ Figure 2). Institutions which were aware of the QSt also stated that they or their provider used rapeseed oil instead as standard oil significantly more frequently than institutions which were not aware of the QSt (63 vs. 45%, $p < 0.001$; response options: yes, no, do not know).

Irrespective of their awareness of the QSt, almost all institutions provided tap or mineral water at all times (97 vs. 96%; question on continuous availability of 5 different drinks). Sustainably-sourced fish was always used only in 22% and 15% of institutions respectively (response options: always, sometimes, never, do not know).

Quality area: meal planning and production

Irrespective of their awareness of the QSt, more than three quarters of all institutions stated, in response to an open question on the length of their menu cycle, that they had a menu cycle of at least six weeks (76%). Vegetarian food was available in significantly more institutions which were aware of the QSt than in those which were unaware of the QSt (80 vs. 65%, $p < 0.001$; question on the provision of 14 different diets, including vegetarian diet).

Quality area: living environment

Almost all institutions (99%) stated that they had snacks available at all times (yes/no question). Institutions were also asked which of the six following service provisions and/or support the residents received (multiple responses permitted): 97% of institutions stated that they asked about residents' wishes and portion sizes and that they served meals and drinks if required, respectively, 93% advised residents on meal selection and 88% named meals when serving. Appropriate assistive devices were provided in 87% of institutions. "Specialist advice on individual diets and food types" was the most infrequently offered service (74%).

A question was asked about the length of time which was accorded to main meals (i.e. from… to…). Most institutions allotted one hour at least (breakfast 90%, midday meal 86% and evening meal 87%).

In this quality area, there were no differences between the institutions which were aware of the QSt and those which were not.

Quality area: hygiene

Almost all institutions, irrespective of their awareness of the QST, stated that they implemented the following five hygiene measures (multiple responses permitted): a cleaning and hygiene plan in 97%, regular training in 96%, temperature measurements in 96% and instructions on good hygiene practice (e.g. hand hygiene) in 95% of institutions. Only the retention of meal samples was implemented significantly more frequently in institutions which were aware of the QSt than those which were not (95 vs. 89%, $p < 0.05$). Moreover, more institutions which were aware of the QSt responded positively to the question on the existence of a HACCP concept (Hazard Analysis and Critical Control Points) in the institution than those which were not aware of the QSt (96 vs. 87%, $p < 0.001$; yes/no question).

Quality area: nutrients

Institutions which were aware of the QSt stated that they had written recipes (62 vs. 48%, $p < 0.01$) and explicit preparation instructions (53 vs. 38%, $p < 0.01$) for at least a majority of their meals significantly more frequently than institutions which were unaware of the QSt (response options: yes for all, yes for a majority, yes for some meals/recipes, no).

Irrespective of their awareness of the QSt, two thirds (66%) of the institutions carried out a nutritional calculation for at least one full menu option (yes/no question). These institutions were then asked whether the nutritional composition of the calculated menu option corresponded to the reference values for nutrient intake ($n = 389$; response options: yes, no, do not know). Institutions which were aware of the QSt ($n = 281$) responded positively to this question significantly more often than those which were not aware of the QSt (= 100) (77 vs. 45%, $p < 0.001$). Institutions which were aware of the QSt also stated that they used software for the nutrient calculation significantly more often than institutions which were unaware of the QSt (58 vs. 39%, $p < 0.01$; yes/no question).

evaluated subject areas of the QSt	with awareness of QSt (n = 45)[a]					without awareness of QSt (n = 30)[a]		
	over-empha-sized	just right	under-empha-sized	should not be included	do not know	should be included	should not be included	do not know
meal planning	8,9	68,9	0,0	6,7	13,3	90,0	6,7	0,0
food selection	15,6	57,8	4,4	11,1	8,9	73,3	23,3	0,0
meal production	6,7	55,6	4,4	13,3	17,8	66,7	30,0	0,0
special diets	2,2	60,0	17,8	2,2	15,6	93,3	3,3	0,0
malnutrition	0,0	71,1	13,3	0,0	13,3	96,7	0,0	0,0
quality management	2,2	64,4	2,2	6,7	22,2	86,7	10,0	0,0
legal stipulations	2,2	68,9	4,4	2,2	20,0	93,3	3,3	0,0
dining atmosphere	6,7	62,2	4,4	11,1	13,3	86,7	6,7	3,3

[a] One respondent with awareness and one respondent without awareness gave no response.

Tab. 1: **Evaluation by catering managers in telephone interviews as to whether the eight subject areas are represented in appropriate detail in the Quality Standard (QSt), differentiated by awareness of QSt (all figures in %)**

Evaluation of the Quality Standard

In the written survey, the majority (85%) of institutions which stated that they were aware of the QSt (n = 403) also regarded it as helpful (yes/no question); 8% gave no response. Of the eight subject areas mentioned, the contents of the QSt were felt to be most helpful for meal planning (68%), food selection (58%) and management of malnutrition (55%). The subjects of quality management (45%), special foods (40%), meal production (39%) and legal stipulations (37%) were regarded as helpful by at least one third of institutions, whereas information about the dining atmosphere proved helpful to only 26% of institutions.

Among those institutions which had not implemented or had only partially implemented the QSt (n = 301), the most frequently selected of the nine suggested reasons for non-implementation were the lack of resident acceptance of wholegrain products (70%) and meat-free meals (55%) and the lack of suitability for resident needs (40%).

In the telephone interview, all eight of the above-mentioned subject areas were rated as "just right" by at least half of those who stated that they were familiar with the QSt (n = 45) (◆ Table 1). The subjects of food selection and meal planning were most frequently felt to be "over-emphasized", whereas more information was desired most often for the subjects of special foods and malnutrition. Between 9 and 22% of respondents provided no evaluation of individual subject areas.

Effects, benefits and obstacles in the implementation of the QSt

In the telephone interview, those who stated that they had implemented the QSt were asked about the effects of implementation (response options: improved, worsened, stayed the same, do not know). Approx. half (55%) of respondents (n = 42) mentioned changes relating to the frequency of their use of certain food groups. The frequency of the provision of vegetables and salad (74%), fruit (52%), fish (48%) and wholegrain products (48%) rose in most of these 23 institutions, whereas the provision of meat fell in more than half (57%). In addition, these institutions often mentioned increases in meal options (45%), cost of goods (41%) and resident satisfaction (31%); although changes in resident satisfaction could not be evaluated by many respondents (24%). No changes emerged in the number of menu options (79%), the use of personnel (79%), the length of the meal cycle (74%) and the motivation and satisfaction of employees (62%) among the majority of respondents.

In an open question about the greatest benefits which had arisen from the introduction of the QSt, 38% mentioned having guidance, 17% a change in food provisions and 14% an increase in resident satisfaction. Two institutions, respectively, reported an improved focus on nutrition and/or greater transparency within the institution as a result of the QSt implementation; one institution mentioned improved costing and planning of catering, and one institution a good compatibility of the quality standards for nurseries, schools and nursing homes as a benefit. 17% of respondents were unable to cite any benefit.

The most frequent obstacles to the implementation of the QSt among the surveyed institutions were costs and tight budgets, a lack of time and a lack of acceptance of certain food groups (◆ Figure 3). The obstacle "difficult to integrate into existing work processes" was the most frequently overcome (86%); the obstacles "inappropriate for residents' needs" (31%), "lack of employee motivation" (44%) and "lack of acceptance of certain food groups" (48%) were overcome by less than half of the institutions which mentioned these as obstacles (◆ Figure 3).

Discussion

590 facilities from around Germany took part in the survey; the return quota was low (7%). Possible reasons include minor interest of the addressed managers in nutrition and/or in scientific surveys in general, probably in combination with a general lack of time. Another explanation may be that, depending on the structure of the institution, other people – catering managers and/or nursing management – may have had to be involved in responding to the survey and this may have seemed too complicated.

The representativeness of the data could unfortunately not be assessed, as comparative nationwide data is largely non-existent. A positive selection of institutions interested in nutrition must be assumed, owing to their willingness to participate.

Awareness and acceptance of the QSt

According to the written survey, more than two thirds of participating institutions were aware of the QSt. It is probable that actual awareness was significantly lower due to positive selection and the possible provision of a socially-desired response. The extent to which the contents of the QSt were known by the institutions cannot be more precisely detailed due to the simplicity of the question on awareness. The inability of some telephone interview participants to provide an evaluation of individual subject areas suggests that they were not aware of the contents in detail.

Implementation of the QSt

The majority of the written and telephone survey respondents who were aware of the QSt also stated that they had implemented the QSt in their institution, at least in part. The nature and scope of this implementation cannot be deduced from this response; this represents only a very rough subjective evaluation by the institution.

Questions on individual quality criteria attempted to record this implementation more precisely. A largely positive image also emerged here. All of the criteria surveyed in the quality areas of "meal planning and meal production", "living environment" and "hygiene" were fulfilled by more than three quarters of the institutions according to their own information; many criteria even by over 90%.

An almost 100% implementation in the area of hygiene requirements is unsurprising, as some of the criteria in the QSt correspond to legal standards. However, inspections carried out in 2013 as part of a nationwide monitoring scheme in 1,069 institutions for older people identified slight to severe deficiencies in hygiene management in 60% of inspected institutions [9]. This discrepancy illustrates the overall difficulty of inspecting quality criteria via surveys. The very positive results must surely be due to the over-estimation of internal quality and to the provision of socially-desired rather than truthful information, at least in part.

Fig. 3: **Frequency of obstacles in the implementation of the Quality Standard (QSt) and whether these obstacles were overcome according to information provided during telephone interviews by catering managers who were aware of and had at least partially implemented the QSt** (n = 42)
Individual enquiries about the 9 obstacles with response options: yes, no, do not know. In the event of a yes answer, this was followed by a further question on whether the obstacle was overcome (response options: yes, no).

In the quality area of "food", the frequency of the provision of cereal and wholegrain products, fruit and fish largely corresponded to the recommendations, according to the information supplied. However, other criteria in this quality area, such as the frequency of the provision of meat and vegetables and the use of sustainably-sourced fish were only implemented by a relatively small proportion of institutions. These criteria seemed to be either less well-known, were felt to be less important or were more difficult to implement.

In response to the questions in the quality area of "nutrients", many institutions stated that they had written recipes and preparation instructions for all or for a majority of meals and that they carried out nutrient calculations. However, at least one third of institutions carried out nutrient calculations without software, and the overall quality of these calculations must remain unknown, even though institutions often affirmed that they met the reference values. The quality of the written recipes is also unknown; only two facilities responded to a request for recipes made during the telephone interview, so that the originally planned analyses of the nutrient content of meals provided could not be carried out. More accurate statements about the nutritional and physiological quality of food provided are therefore not possible.

Some criteria were more frequently implemented by institutions which were aware of the QSt than by those which stated they were not; i.e. the recommendations on the frequency of the provision of cereal products, wholegrain products, fruit and fish were fulfilled more often. In addition, rapeseed oil was used more often as standard oil, vegetarian food was more frequently offered on request, a HACCP concept was available more often and meal samples were retained more often. Recipes for meal production and explicit preparation instructions for at least a majority of meals were also provided more often, and insofar as a nutrient calculation was carried out, the nutrient composition more frequently corresponded to the reference values, according to the information provided and without external verification of these statements. Likewise, software was used to calculate nutrients more often by institutions which were aware of the QSt than those which were not aware of the QSt.

It is gratifying to note that an awareness of the quality standard among respondents led to concrete improvements in practice, even in the event of only partial implementation. However, this should be qualified by the fact that, due to the cross-sectional design of the study, we cannot exclude the possibility that these criteria may have already been implemented as a result of a general interest in and good knowledge of nutrition irrespective of the QSt. Institutions which were not aware of the QSt appeared to be generally well-informed about the quality criteria as well.

Evaluation of the QSt

If the institution was aware of the QSt, the latter was largely regarded as helpful.

The majority of institutions regarded all the subject areas of the QSt as relevant to catering standards; the subjects of "malnutrition" and "special foods" seemed to be of particular interest.

"Food choice" and "meal production" were surprisingly listed as subjects which should not be included or which should be included to a lesser degree in the QSt; this may be due to the fact that respondents were well informed about these subjects and therefore less interested.

Effects and benefits of the implementation of the QSt

Changes in food provision were cited as an effect of the implementation of the QSt in the telephone interview by a good half of respondents, as well as improvements in work processes and in meal preparation [8]. The increase in resident satisfaction mentioned by a third of respondents is gratifying; however, these effects were unable to be assessed in many cases, which suggests that many catering managers do not know the needs of their diners and the level of acceptance of meals. Deficiencies in communication and in interface management were apparent in the written surveys and the qualitative interviews [8] (not illustrated in more detail here due to lack of space); this urgently requires improvement in future.

According to the telephone interviews, many catering managers felt that the greatest benefit of the QSt was the provision of guidance on how to structure catering, thereby increasing confidence in their own work, which corresponds fully to the objectives of the QSt.

A relatively high proportion of respondents (17%) were unable to ascribe any benefit to the QSt. This may be due to an already high quality of catering or to the misevaluation of its own potential for improvement. A critical self-view of the institutions and further research into how the QSt could be better adapted to the needs of institutions would be desirable in this instance.

Obstacles and challenges

Budget and personnel issues were most frequently cited as obstacles to the implementation of the QSt in telephone and individual surveys [8]. This shows that the framework conditions for the implementation of high-quality catering standards are frequently regarded as problematic.

Another frequently-mentioned obstacle to implementation was the "lack of acceptance of certain food groups". It may not be clear to all catering managers that the QSt is about providing a healthy option and not about forcing the residents to adopt a certain diet. There may also be a deficit in knowledge relating to the practical implementation of a food option which corresponds to recommendations in a way which also suits residents. Potential overlaps of a healthy and a well-accepted option should be identified and integrated in future quality standards.
It cannot be excluded that the obstacles to the implementation of the QSt and the measures taken to overcome them may be general obstacles encountered in everyday catering.

Conclusion and recommendations

These results may help with the further development of the QSt. In future, for example, the potential benefits of the QSt and the added value for the institution through implementation should be made clearer and be better communicated, as many institutions were unable to cite any benefits.
The reasons cited for non-implementation – lack of acceptance among residents, lack of suitability for all residents – suggest that many institutions see these recommendations as guidelines for all residents which must be implemented without alternative. The intention of the QSt – to give residents the choice of a healthy option in consideration of their individual needs and resources – must be more clearly stated and communicated. Concrete examples should be provided to illustrate how the criteria – e.g. an increased use of vegetables and wholegrain products – may be implemented in accordance with residents' needs and desires.
Catering for special requirements such as malnutrition, difficulties in swallowing or dementia, which are important topics in nursing homes, should be addressed in more detail in the quality standard.
Concrete suggestions should also be formulated for communication and interface management, to promote interdisciplinary collaboration among employees.
The implementation of the QSt could also be substantially supported by the inclusion of core contents in mandatory quality inspections by the *Medizinischer Dienst der Krankenversicherung* (MDK) (Health Insurance Medical Service) and by the development of joint audits for nutritional care as a whole – from meal provision to nursing care.
These results on the implementation and effects of the quality standard should be complemented by on-site inspections in future, as it is impossible to obtain reliable detailed records and analyses of multiple attributes by means of surveys. Future research should explain how the implementation of the QSt and the compliance with certain quality criteria affect the residents' nutritional status and satisfaction.

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Conflict of Interests
Prof. Arens-Azevêdo is the President and Prof. Volkert is a member of the Scientific Committee of the *Deutsche Gesellschaft für Ernährung* (DGE) (German Nutrition Society).

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Beyond that, the authors declare no further conflicts of interest.

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