

# Influence of the daily context on the process of change in nutritional behaviour

Qualitative survey of individuals with increased cholesterol levels

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## Abstract

A qualitative survey was performed to identify the individual subjective conditions and factors at various points or stages during the process of change in nutritional behaviour. The investigation was based on the theoretical assumption that the process of change in health behaviour passes through five stages; in the first stage the subject is undecided and in the final stage active. Although current research is concentrated on persons who are already health conscious, this new approach makes it possible to include individuals who have been inactive. Before the study started, there was a group discussion with practicing nutritionists. The results of the following individual interviews imply that nutritional intervention should be more strongly focussed on the individual and on the circumstances of their daily lives. At the same time, current knowledge on health psychology should be incorporated.

**Keywords:** change in nutritional behaviour, day-to-day life, behaviour-modelling barriers and resources, stage models

Theoretical concepts and the results of research in health psychology have had little influence on nutritional research or interventions [5, 6]. However, so-called "stage models" (e.g. the Transtheoretical Model of health behaviour change or the Health Action Process Approach) can be used to derive specific strategies to adopt and maintain healthy behaviour. These psychological models assume that persons on the path to the desired healthy behaviour undergo development through different stages. It follows that measures to support health should be designed to support persons in their transition to the next stage, for example, in that they make the decision to change their behaviour in future (intention formation, see too ♦ Figure 2) [7].

## Introduction

Nutritional behaviour is very stable over time, so that it is very tedious to bring about a permanent change in behaviour [1]. For a long time, preventive and acute measures in nutritional education, instruction and advice have largely concentrated on enhancing nutritional knowledge [2, 3]. However, some studies have shown that the acquired nutritional knowledge has only a very minor influence on daily health conscious nutrition. Although basic nutritional knowledge is essential for health conscious nutritional behaviour, it does not provide a complete explanation for the intention or decision to adopt healthy nutrition or for the implementation of this intention [4, 5].

## Theoretical framework

### Mapping daily complexity and empirical findings on daily nutritional behaviour

The concepts and theories of social science show that changes in daily behaviour depend on psychological and structural factors, as well as interactions within the family, the workplace and leisure time. Aside from the other lifestyle requirements, nutritional behaviour must be integrated into the organisation of daily life. Thus, it cannot be investigated in isolation in only a single

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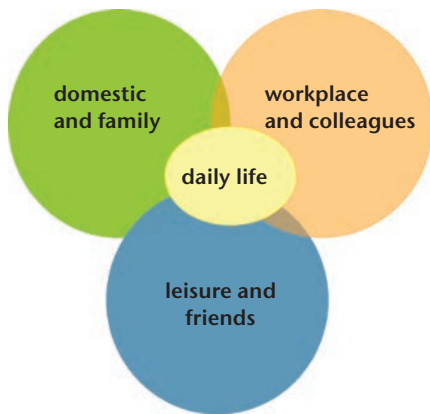


Fig. 1: Structural and social areas of daily activity (simplified presentation)

area of life (e.g. domestic matters), but must be regarded in the context of other areas of life (workplace or leisure) (♦ Figure 1) [8–12].

There seem to be empirical “blind spots” with respect to the influence of personal environmental factors on (nutritional) health behaviour [13, 14]. For the German-speaking area, there are individual studies that describe nutritional behaviour in the private and/or professional environment. However, these concentrate on selected aspects, such as the planning of meals [e.g. 17, 18], cooking expertise and purchasing behaviour [19], company catering [20] or external (leisure time) consumption [aspects in e.g. 18]. What we are missing in Germany is a comprehensive and integrated consideration of the domestic, professional and leisure time dimensions of daily nutrition.

### Health psychological models and analyses of theoretical stages

There are several published models on the description and prediction of health-related behaviour. These can be divided into continuous (static)

models and dynamic stage models. **Continuous models** postulate that individuals pass through a process of change in behaviour in a linear manner: The greater the values of the model components, the greater the effort to change behaviour. Classical examples of this are the Health Belief Model, the Protection Motivation Theory (R. W. ROGER) or the social cognitive theory (A. BANDURA) [21]. In contrast to this, more modern models assume that there are different stages or steps through which persons pass during the process of a change in health behaviour. In these **dynamic models**, it is assumed that persons in the same stage resemble each other in their thoughts, feelings and behaviour [22]. Once an individual has successfully passed through the influences of one stage, he moves into the next stage on the way to the desired behaviour. These **stage models** include the Transtheoretical Model of health behaviour change (J. O. PROCHASKA et al.) and the Health Action Process Approach (R. SCHWARZER) [21].

The process approach of R. SCHWARZER (♦ Figure 2) postulates that intention formation can be predicted from three social cognitive variables: “perceived self-efficacy” (subjective conviction

that the desired behaviour will be achieved due to the subject’s own abilities or expertise), “outcome expectancy” (subjective conviction that the desired behaviour will lead to the desired result) and “risk perception” (perceived threat from the risk to health). Thus part of the model is the motivational phase. How individuals manage to implement the planned action is shown in the following volitional phase. This is characterised by action-related cognition (action planning, action initiative and action maintenance). Personal, social and situational resources and barriers play an essential role here.

The present study concentrates on the resources and barriers.

A classification into 5 stages is currently favoured, as based on the insights of the trans-theoretical model [23]. The main point of the criticism of this model is that assignment to the different stages has apparently been arbitrarily operationalised on the basis of temporal criteria. More recent studies indicate that stages in changes of behaviour should be recorded on the basis of psychological criteria (such as habituation, planning and intention) [24]. ♦ Table 1 shows an example of this type of characterisation.

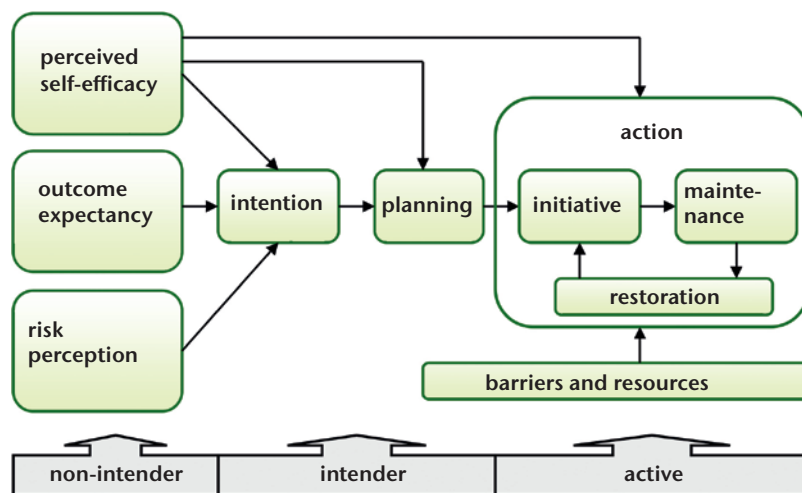


Fig. 2: Health Action Process Approach (modified from [21])

Stage	Description
I. Precontemplation	Subject does not perform the target behaviour (e.g. fat-conscious nutrition) and is not thinking of changing his behaviour.
II. Contemplation	Subject does not perform the target behaviour, but is considering whether he wishes to do so (there is as yet no intention).
III. Preparation	Subject does not perform the target behaviour, but has the firm intention to perform the target behaviour and is making initial preparation (e.g. is planning how to obtain fat-conscious nutrition at the workplace).
IV. Action	Subject performs the target behaviour, but finds implementation difficult (e.g. due to daily obligations).
V. Maintenance	Subject performs the target behaviour and this has become his fixed habit.

Tab. 1: Description of the stages of changes in health behaviour on the basis of psychological criteria (modified from [23–25])  
 Persons in the stages of precontemplation and contemplation (stages I and II) are also designated as “non-intenders” or “inactive”. “Intenders” or “preparers” are persons in the stage of preparation (Stage III). The “active” or “actors” are persons in the stage of action and maintenance (Stages IV and V) [21].

### Research objective

Our primary research interest was comprehensive consideration of health behaviour within the three areas of daily life: domestic and family, workplace and colleagues, and leisure and friends. The objective was to identify the subjective factors that support or inhibit changes in nutritional behaviour. Moreover, the factors identified were to be compared for the individual stages. The target group for this study were persons with a current health problem. We selected persons with hypercholesterinaemia, as this is linked to increased risk [24]. Moreover, they can (to some extent) influence blood cholesterol by nutritional changes. The target behaviour was defined as the wish to achieve fat-conscious nutrition.

### Empirical context of survey

A qualitative procedure was selected, as the research was exploratory.

#### Pre-study: Group discussion with nutritional advisors

Before the study on 9 January 2009, there was a moderate group discussion with 7 practicing nutritionists (6 women, 1 man), who were organised within an association (*Realgruppe*) [Real Group]. The participants had been working as nutritionists for many years and were therefore experts in the area of the study. The primary objective of the group discussions was to use the practical work of the nutritionists (client-generated) to identify everyday conditions that can inhibit or support a change in nutritional behaviour. For this purpose, the discussion participants were first asked

to report openly on their practical experience. After this, the discussion addressed additional determinants of changes in nutrition in the daily setting that are known from other studies. The discussion was supported by a guideline and led to the identification of the following factors on nutritional behaviour in all three everyday areas:

- taste preferences of the social environment
- acceptance of the type of nutrition by the social environment
- available time
- emotional barriers (e.g. anger, sorrow, disappointment)
- situational barriers (e.g. parties, stress, boredom, holiday)
- everyday rituals or habits (e.g. a piece of cake in the afternoon)
- financial resources

In addition, specific variables were given for each area of life:

- domestic and family: previous purchasing and cooking habits, family structure
- workplace and colleagues: Catering possibilities and cooking equipment, working plan
- leisure and friends: frequency of external activities, availability of food outside the house

The results of the group discussion provided the foundation for the development of the interview guideline for the subsequent principle analysis.

#### Main survey: individual interviews

During the period from 30 March 2009 to 10 February 2010, a total of 23 problem-centred interviews were performed, which lasted between 35 and 110 minutes (mean: 62 minutes per interview). Three interviews had to be excluded retrospectively, as they failed to fulfil the criteria of case selection. The survey

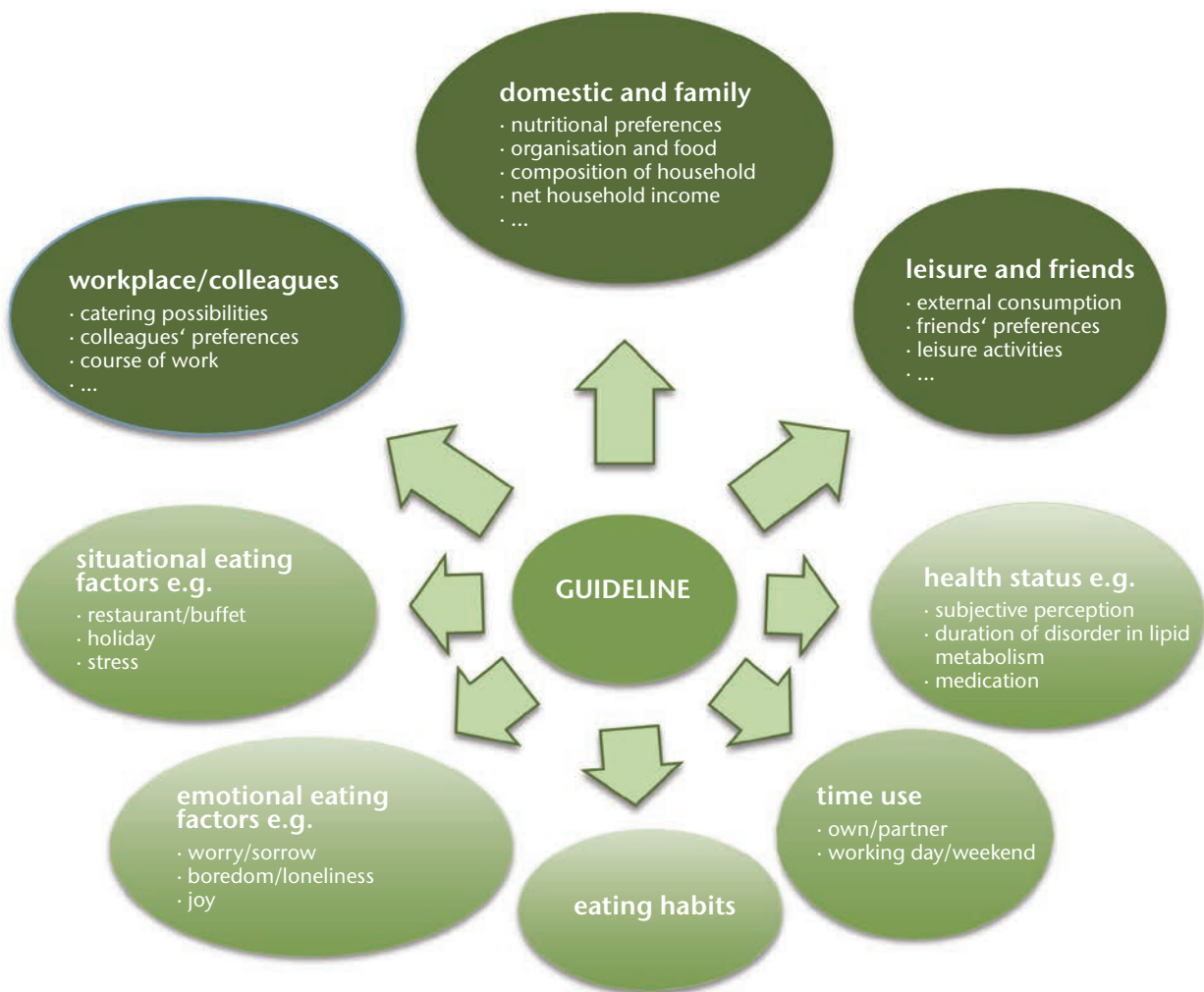


Fig. 3: Theme fields of the interview guideline (own illustration)

instrument was a semi-structured interview guideline. This was split into 8 theme complexes, which were orientated towards the findings of the group discussion (♦ Figure 3). The initial trigger was the request to provide an unstructured report of the eating and drinking habits on a typical working day and then on a typical day during the weekend. After this, the investigator addressed previously unconsidered theme complexes in the guideline, for example, to ask about eating habits when bored or at parties.

The resulting transcript material was evaluated by MAYRING'S procedure for quantitative content analysis [26]. With the help of a coding

guideline, the freely formulated individual statements were split into categories.

#### Criteria for case selection

To be able to map the three areas of life, the interview partner had to have fulltime employment, or at least 75 % employment. The workplace had to be spatially separate from their home. To test the stage specificity of nutrition-related daily conditions, the survey was designed as a cross-sectional study. For each of the 5 stages, the change in health behaviour was surveyed for two men and two women (n = 20). The author assigned the volunteers to the individual stages,

on the basis of current fat consumption (consumption of spreadable fat, sausage and meat, milk products), as well as the planned future fat consumption (intention, planning, habituation), using a previously defined algorithm (♦ Figure 4).

#### Results

The results described below correspond to the factors that influence daily nutritional behaviour, as reported in the individual interviews. After a general description of the sample, the factors identified are explained, in accordance with the

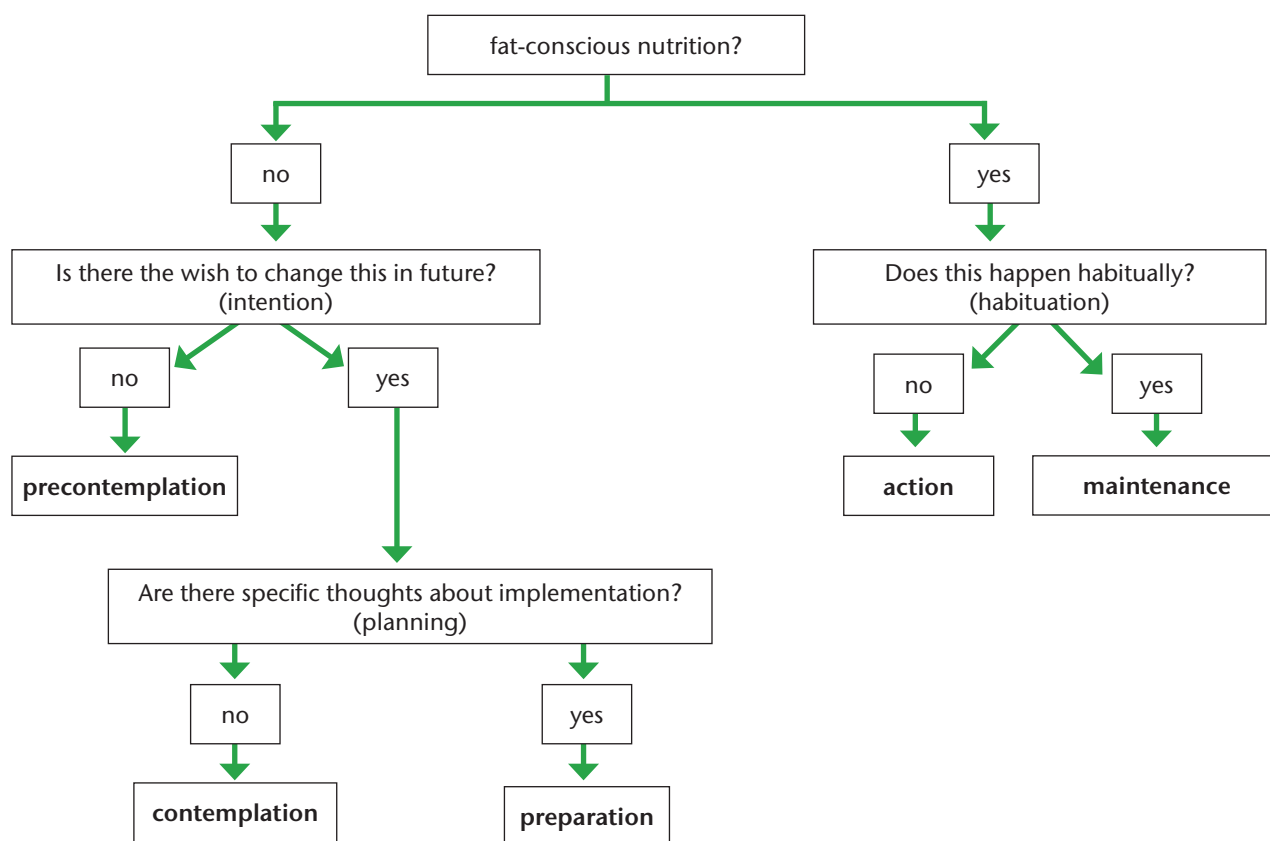


Fig. 4: Algorithm on stage classification for “fat-conscious nutrition” (own illustration based on [25, 27])

study objective and bearing in mind the five stages of behaviour change. At this point, we will only give an extract of the results of the main survey; the full version can be found in HILDEBRANDT 2012 [28].

**Description of the sample**

*Age and composition of household*

At the time of the survey, most of the participants were between 45 and 54 years old (range 25 to 65 years).

Three out of four subjects assigned to the first three stages (precontemplation, contemplation, preparation) lived in households of two or more persons. The ages of the children in the households with more than one person lay between 7 and 31 years. The households of the subjects assigned to the last two stages (action and maintenance) were childless

and included the same proportions of persons with partners (two person households) and persons living alone (one person households).

*Health status and lipid metabolism disorder*

All subjects described their general state of health as good to very good. They felt that they were as fit, or fitter, than persons of the same age. Apart from the lipid metabolism disorder, they had no health problems requiring long term treatment. For all subjects, the diagnosis of high cholesterol values was at least 5 years previously. In the first two stages and in the stage of action, the subjects had been aware of the raised cholesterol values for at least 10 years (♦ Table 2).

For all stages, at least one person took drugs to reduce cholesterol. Active persons (stages IV and V) were

more often under drug treatment.

*Factors generally supporting or inhibiting fat-conscious nutrition*

In all stages, the arguments given for fat-conscious nutrition include weight loss and the resulting benefit for personal health (reduced blood cholesterol, dispensing with lipid reducing drugs). Subjects in the stage of preparation also mentioned that the increase in nutritional knowledge from participation in nutritional training (including awareness of practical examples), together with spontaneous reading of technical books, was helpful for the transition to fat-conscious nutrition. Several subjects in different stages considered that arguments against fat-conscious nutrition included doing without tasty food (dispensing with luxuries such as chocolate,

limited choice of permitted foods), the lack of health problems and more effective reduction in cholesterol levels by taking drugs.

## Household and family

### *Nutritional wishes of other members of the household*

In multi-person households, there was increasing disagreement about food preferences in the higher stages. These deviations particularly applied to the consumption of meat and sausages. According to the subjects, their partners and/or children more frequently wanted meals with a lot of meat or with fattier meat than they did themselves. This divergence in different taste preference was solved differently in the individual stages. In the first three stages, the subjects essentially adapted to the wishes of their families, but in the last two stages, eating behaviour was more individualised.

**Example 1:** *“It doesn’t bother me, if my wife cooks herself shrimps or tripe. She can eat it if she likes the taste. I don’t have to have it.”*

[Original citation: *„Mir macht es nichts aus, wenn meine Frau sich da irgendwelche Shrimps oder Innereien zubereitet. Sie kann die essen, wenn sie ihr schmecken. Ich muss es nicht haben.“*] (Maintenance stage)

**Example 2:** *“Then we cook separately, sometimes completely separately. But sometimes we do find something in common. Chinese food is a good example. The large bowl is then split into two. One of us adds meat and the other keeps it vegetarian. Just as we like.”*

[Original citation: *„Wir kochen dann getrennt, manchmal komplett. Manchmal finden sich auch irgendwo Gemeinsamkeiten. Ein gutes Beispiel ist das Chinesische. Dann wird die große Schale irgendwann aufgeteilt, dann kommt bei dem einen Fleisch dazu, bei dem anderen bleibt es vegetarisch. So wie jeder mag.“*] (Maintenance stage)

Behaviour stage	Diagnosis of lipid metabolism disorder ... years ago	Number of subjects with medication
pre-contemplation (n = 4)	> 15	2
contemplation (n = 4)	10–14	1
preparation (n = 4)	5–9	1
action (n = 4)	10–14	3
maintenance (n = 4)	5–9	2

Tab. 2: **Diagnosis and medication of lipid metabolism disorders in different stages (n = 20)** (own illustration)

When it was not possible to reconcile the nutritional wishes and habits of the family with the subjects’ own conceptions, this was felt to be a barrier to a change in behaviour in all stages.

### **Support in the family**

Relationships within the family play an important role in reaching the decision to change nutritional behaviour (stage III) and in implementing this decision (stages IV and V). If the subject felt that his family were interested in the change in nutrition and accepted it or even backed it up, it was easier to achieve the intended objective.

### **Social or situational and emotional factors at home**

At all stages, the subjects reported that they consumed salty and high fat snacks in an uncontrolled manner when they were bored or distracted (e.g. when watching television or when reading in the evening). In addition, active subjects reported that they ate high fat foods when under stress due to the organisation of family events, or in moments that were socially pleasant or when they were angry or frustrated. Some of them countered this by restricting the amount of sweets

kept at home or by separating out small quantities for snacks.

### **Sharing family and domestic work**

In all stages, the work involved in domestic activities and in catering was shared among the members of all multi-person households. Women in the stages of pre-contemplation and contemplation (stages I and III) reported that they spent a great deal of time with family duties (e.g. care of sick parents or parents-in-law, supporting their children in time-consuming hobbies, caring for grandchildren) and they felt that this was a barrier to forming an intention or adopting fat-conscious nutrition. To support their work in the house and garden, subjects from the active stages regularly employed external service providers (e.g. gardeners, cleaning women or dry cleaners).

### **Area of everyday life: workplace and colleagues**

#### **Workload**

Subjects in the first stage (pre-contemplation) felt that the workload was very high. They had work without a regulated predictable timetable, such as being a sales representative or working in a day care centre for

children. Moreover, they had flexible working hours – which was felt as being a barrier to initiating a change in behaviour. Most subjects in stages II to V had an office job, with a regular workflow and fixed times of work. They rated their workload as normal to high.

#### **Reconciliation of family and profession**

The inactive subjects in the survey, who were under high levels of family stress, also had jobs with a stressful workflow and high workload (both quality and quantity). They contributed most of the domestic income. Their partners were either exposed to the same levels of professional stress or were unemployed (external assessment). There is no consistent picture here. In their dual role as principle earner and father or mother, they are aware of the responsibility of successfully reconciling profession and family.

#### **Meals at work**

The subjects ate their main meal during working hours. They also often had a light snack. At all stages, the subject reported that the availability of food was good to very good at work or in the immediate vicinity (e.g. restaurant, snack bar, baker or butcher). Inactive subjects in stages I and II tended to eat outside the workplace. When time was short, the subjects consumed food they had brought themselves, sometimes while continuing to work. In contrast, few subjects in the action and maintenance stages used the external sources, as they considered that the nutritional quality or method of preparation was inferior (or too fatty). They tended to provide their own cold or hot food, which they (or their partner) had either prepared in advance at home or directly at the workplace. Their methods of food preparation depended on the equipment provided at the workplace (kitchen range or microwave, pots and pans, cutlery etc.).

#### **Social and situational and emotional factors at the workplace**

In this category, subjects in all classes only reported barriers to fat-conscious nutrition:

- lack of time due to excessive workload
- freely available food
- eating rituals with colleagues (e.g. coffee and cake in the afternoon)
- business trips with limited food selection
- special occasions (e.g. birthdays or Christmas parties)

Active subjects also reported that high workload could have an unfavourable effect on domestic nutrition, so that they had recourse to less fat-conscious convenience products.

#### **Area of everyday life: leisure time and friends**

##### **Type and frequency of leisure time external consumption**

In all stages, similar situations for external consumption were reported. For example, this could be friendly moments with persons from the social environment. On the other hand, this might be a rapid and convenient snack during activities outside the house. Active subjects reported that the limited selection of meals was a barrier to fat-conscious nutrition during external consumption (e.g. in motorway services). It was felt to be helpful to know about various external sources of food and what they provided (including ingredients and methods of preparation). Active subjects planned external consumption in advance.

**Example:** *“I think about what I could eat in advance and, if I really have no idea if there is anything there, I either try to eat before or I fetch a lye roll and pack it into my bag, in case I don’t find anything”. [Original citation: „Ich überlege mir schon vorher, was*

*ich essen könnte und, wenn ich wirklich überhaupt keine Ahnung habe, ob es da was gibt, versuche ich entweder vorher zu essen oder ich hole mir ein Laugenbrötchen und packe das in die Tasche, falls ich nichts finde.“]* (Maintenance stage)

#### **Social and situational and emotional factors in leisure time**

In all stages, subjects found it difficult to eat in a fat-conscious manner in socially pleasant situations (e.g. eating in pleasant company). To maintain fat-conscious nutrition during leisure time – analogously to the situation at work –, it was helpful if a variety of foods were available, from which a selection could be made. Moreover, it was favourable if the ingredients of the dishes were clearly presented.

When a variety of food was available, but was free of charge, the subjects found it difficult to restrict the amount they ate and they tended to consume dishes that they would normally have avoided. Active subjects deliberately attempted to avoid these situations (e.g. they did not book all inclusive travel) or limited the size of their portions (e.g. in buffets).

## **Discussion**

The results show that changes in nutritional behaviour must be reconciled with the concerns of daily life (organisation of family duties, coordination of irregular workflows, maintenance of social relationships, etc.). Thus, measures to change behaviour must consider the fact that the desired target behaviour must be adaptable to the structure of everyday activities and the available social networks.

Moreover, the stage-specific consideration of the results also indicates that barriers and resources for action may be stage-specific or apply to all stages.

As the statements from subjects in the first three stages were almost identical, as were those from subjects in the last two stages, it seems to be expedient to combine the 5 stages investigated into at least 2 – or possible 3 – higher order phases:

- a) pre-action phase (stages I–III)
- b) action phase (stages IV–V)

This procedure is consistent with other stage theoretical analyses [24]. It is also possible that the pre-action phase should be further differentiated – e.g. between pre-decisional and post-decisional, as in the Health Action Process Approach. This is not unambiguously clear from the present study and could be the subject of future research.

As there is evidence for phase-specific conditions and factors that influence changes in behaviour, recommended activities must be formulated in a phase-specific manner. Thus, measures to support changes in behaviour could be specifically adopted and those measures which do not influence a specific phase

could be regarded as less important or be dropped (saving time and money). The meta-analysis of NOAR et al. showed that stage-specific interventions have significantly greater influence on changes in health behaviour than do standard methods that are not stage-specific (“watering can principle”) [29].

♦ Table 3 lists the essential resources for intention formation and adoption or maintenance of fat-conscious nutrition as identified in the present study. Thus, a subject in the pre-action phase must first manage successfully to coordinate family and professional challenges. Only then will he be capable of considering or be in the position to tackle the additional requirements of changing health behaviour. Once a subject has formed the intention to change his behaviour, the communication of knowledge can help him to adopt the desired change in behaviour. Important actions to maintain the intended behaviour include meal design – particularly in special eating situations (e.g. birthdays, business

trips, or when bored or frustrated), as well as support from the family.

### Critical assessment of the study design

Our decision to use a cross-sectional analysis was based on the work of LIPPKE et al.: Consideration of the different subjects in the individual stages of a change in behaviour corresponds to the consideration of the subjects at different “points” in the process of a change in behaviour [24]. For data evaluation, when individual factors are recorded simultaneously, this then means that no conclusions are permissible about intra-individual changes or causalities [30]. However, bearing in mind the basic assumption of stage models, it appeared to be possible to map typical nutritional behaviour within a stage. Last but not least, the decision for the cross-sectional analysis was based on the available financial resources.

The criticism must also be made that

Resources of everyday changes in nutritional behaviour	
... in the pre-action phase	<ul style="list-style-type: none"> <li>• successful reconciliation of the taste preferences and nutritional habits of other household members with the target behaviour desired by the subject</li> <li>• successful organisation and implementation of family procedures</li> <li>• successful coordination of professional requirements with respect to workflow, working time and workload</li> <li>• communication of in-depth information to intended subjects on the links between nutrition and individual state of health</li> </ul>
... in the action phase	<ul style="list-style-type: none"> <li>• support and appreciation by the family</li> <li>• planning company meals (What? When? Where? With whom? Procedure for rituals such as afternoon cake) in accordance with the catering situation (local restaurants and cafés, technical equipment of the kitchen, preparation of own meals)</li> <li>• communication of action plans (when-then plans) for emotional and situational eating moments (e.g. from anger, frustration, joy; birthdays, boredom, stress, in front of the television)</li> <li>• planning of private external meals (restaurant, range)</li> <li>• clear information on ingredients, nutrients and methods of preparation for external consumption</li> </ul>

Tab. 3: Necessary actions for changes in the behaviour of subjects with lipid metabolism disorders (own illustration)



the results in the present study are based on a qualitative investigation of selected cases and thus fail to fulfil the traditional scientific demand for a representative sample.

In general, the investigation does not take into account the multiple factors that determine normal nutritional behaviour, or the nutritional or health psychological explanatory models. It is rather the case that the results are building blocks to help us understand these complex interactions and that they suggest new direction for research (e.g. can these results be generalised to different groups of subjects? Can our stage-specific findings on the barriers and resources in daily nutrition be confirmed by quantitative surveys? Are there stage-specific intervention effects?)

## Conclusions

On the basis of the subjects' everyday activities, our results support the demand that nutritional interventions should be more focussed on the actors, particularly their position or the way to the desired behaviour (pre-action and action phases), as well as their domestic and family procedures, workplace requirements and leisure time behaviour. From the point of view of model theory, the results emphasise the need to carry out more intensive research on the stage specificity of barriers and resources that modify behaviour.

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### Conflict of Interest

The author declares no conflict of interest according to the guidelines of the International Committee of Medical Journal Editors.

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