Designing and Testing a Questionnaire to Measure Sedentary Behaviour during Leisure Time

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Abstract

A questionnaire that measures sedentary activities during leisure time was missing. Previous studies investigated Sedentary Behaviour (SB) focused a lot on children, watching TV or physical activity. Since SB during leisure time covers a large amount of total sitting and lying time and SB's bad health consequences, it was necessary develop a self-report measure to investigate the context in which SB during leisure time occurs. Further, all EU-countries (including) seems to be affected by SB, therefore it was important to develop a measurement in another language to measure SB in further languages. A tool that measures SB with specific activities could be helpful to design effective interventions to reduce SB during leisure time. At first, it was important to collect all potential sedentary activities by interviewing 10 employees of eight different working areas. Therefore, the existing *Brief Questionnaire on Occupational Sitting (BQOS)* was extended with 11 specific sedentary activities during leisure time. After the BQOS was extended and translated, it was important to carry out five Three-Step Test-Interviews (TSTI) to test the understandability and completeness of the questionnaire. Four of the five TSTIs were applied in German and showed eight categories of problems and suggestions for improving the extended questionnaire. After the feedback of the TSTI, the extended questionnaire was finally improved. Regarding the completeness, the questionnaire covered all potential sedentary activities in both, the English and German versions and all potential including sedentary activities is independent of the language. The German version of the extended BQOS seems to be understandable but on the English version no conclusion can be drawn due to the small sample of English speaker. Therefore, for the validity, the English extended questionnaire needs some pre-testing. In addition to that, for both versions it would be beneficial to use accelerometers as further validation tool next to a diary.

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Introduction

Our levels of sedentary behaviour and physical activity have changed due to technological innovations and changing economic demands (Hadgraft et al., 2016). The need for physical activity has decreased, which has led to increased sitting behaviour (Owen, Healy, Matthews, & Dunstan, 2010). Sedentary Behaviour (SB) is defined as any behaviour symbolised by an energy expenditure of above 1.5 metabolic equivalents (METs) while being awake and in a sitting, reclining or lying position and is different from a simple absence of physical activity (Tremblay et al., 2017). SB is related to several adverse health outcomes such as the development of chronic diseases like depression (Hallgren et al., 2020), type 2 diabetes, cardiovascular disease (Wilmot et al., 2012), osteoporosis (Chastin, Mandrichenko, Helbostadt, & Skelton, 2014), some types of cancer, premature death and overall mortality (Biswas et al., 2015; Kerr, Anderson, & Lippman, 2017; Thorp, Owen, Neuhaus, & Dunstan, 2011).

The prevalence of SB was high in EU-countries with an average of 7.5 hours per day. In 2019, the Dutch population (aged ≥ four years) spent 8.9 hours on average sitting every day, on the weekend, the average was one and a half hours less. The Eurobarometer 2017 made an international comparison and showed that 32 % of the Dutch citizens stated sitting more than 8.5 hours on an average day, which is significantly higher (12 %) than the average of the EU-countries (Rijksinstituut voor Volksgezondheid en Milieu. (n.d.). In 2018 people in Germany sat on average 7.5 hours during a normal workday (Deutsche Welle, 2018).

Physical activity has a moderately protective effect, especially when sitting time is high. By taking physical activity into account, it has been expected that adults who sit more than 10 hours per day increase the all-cause mortality risk by 34 %, whereby the risk seems to increase significantly when the amount of sitting surpasses 7 hours per day. Next to that, the all-cause mortality risk is increased by 52% when physical activity was not taken into account (Chau et al., 2013).

Mixed findings were found in studies about compensating or not compensating lack of occupational activity in the leisure time. Two studies using self-reported measures concluded that working in low activity occupations resulted in high levels of leisure-time physical activity, indicating that these workers try to compensate for their lack of activity in occupation time (Burton & Turrell, 2000; Salmon, Owen, Bauman, Schmitz, & Booth, 2000). Most studies suggested that office workers are inclined to have higher leisure physical activity than factory workers (Parry & Straker, 2013). On the other hand, one study found out that having a more active occupation is not related to leisure time physical activity. It might be expected that those employees with higher activity in their jobs would engage in more leisure time SB, but this was not the case (Tigbe, Lean, & Granat, 2011). The attempts to compensate for the high frequency of SB in occupation time in the leisure time with more physical activity are not that

simple, and several studies showed that SB is independently of physical activity associated with health risks. Those people who are physically active but show a high frequency of SB are called "Active Couch Potatoes". In fact, it is important to avoid prolonged uninterrupted periods of SB, as well as being physical active for metabolic health (Healy, Dunstan, et al., 2008; Healy, Wijndaele, et al., 2008). In Germany, watching TV was the activity in which the people sat uninterrupted for the longest time (around 120 minutes per day) (Deutsche Welle, 2018).

A recent study suggested that higher volumes of SB in the context of leisure-time raise the odds of self-reported depression and anxiety symptoms. A higher rate of interruptions of SB can decrease the odds that these symptoms will occur (Hallgren et al., 2020). Prior, one study indicated potential benefits on cardio-metabolic health when interrupting sedentary time (Chastin, Egerton, Leask, & Stamatakis, 2015). Interruptions in SB in domestic and leisure settings are achievable through different strategies (Owen, Healy, Matthews, & Dunstan, 2010). A simple possibility, which is both practical and coherent with epidemiologic evidence, could be to get up and move after 30 minutes of uninterrupted sitting. To interrupt SB, light-intensity activities could be promoted (e.g., standing up during TV commercials or while having a phone call) (Hallgren et al., 2020).

Besides the occupational time, people have many possibilities to engage in SB. The use of a computer or television screen and using devices such as tablets, smartphones and gaming consoles has great potential to increase the leisure-time SB (Shrestha et al., 2019). According to the American Time Use Survey, on an average day, citizens (aged ≥ 15 years) watch TV for more than half of their leisure time (ATUS, 2019). Recent works have indicated that sedentary behaviour that is passive (e.g., watching TV), which mostly occurs during leisure-time, is more harmful to psychological wellbeing than mentally active SB (e.g., office work and problem-solving), which mainly occurs during the occupational time (Hallgren et al., 2018; Hallgren, Thi-Thuy-Dung, et al., 2020). One plausible explanation for the differential effects of passive mentally active sedentary activities is related to the context of these activities. Employment is linked to better mental health, even when office work involves sedentary tasks, it can promote a sense of autonomy, self-reliance and achievement (Lee et al., 2017). In addition to that, active participation and engagement in work-related tasks are linked to greater work satisfaction and happiness (Boyatzis, McKee, & Goleman, 2002). By contrast, sedentary activities that are passive, such as watching TV and listening to music require minimal cognitive effort. Physical and mental inertia are associated with depression and research showed that depressed individuals are less physically active and spent more time in passive behaviours (Mammen & Faulkner, 2013; Teychenne, Ball, & Salmon, 2010).

The social-ecological model (SEM) makes it possible to understand the appearance of SB in various domains of leisure, transportation, and occupation. Therefore, such ecological models help in explaining and predicting SB (Owen et al., 2011). In the SEM, the individual stays at the centre of an ecosystem

and tries to understand better the multiple factors and barriers that influence SB. Inside this model, the 'behaviour settings' construct emphasises the effects of specific contexts or domains in which behaviour happens (Hall, 1969). Encouraging or educating individuals to adjust their behaviour (too much sitting) is unlikely to be successful if their physical and social environments do not support the behaviour (Hadgraft, Dunstan, & Owen, 2018). Classifying and understanding modifiable factors inside the different domains of SB is important to develop successful interventions and suitable policies to address those interventions. Multiple factors impact an individual's choice and risk of engaging in SB, whereas the constructed environments and social norms can promote time spent sitting (Owen et al., 2011).

Due to SB's bad health consequences, it is important to design comprehensive models, build up interventions to reduce sitting time, and classify populations suffering the most from the health consequences. The foundation relies on valid questionnaires screening unhealthy behaviour, and the fundament of behavioural epidemiology is to offer practical guidelines that promote dealing with common health-related problems. Behavioural epidemiology aims to support healthy behaviour by using empirical obtained insights to create effective interventions (Sallis, Owen, & Fotheringham, 2000). In SB's context, the interventions would reduce the numbers of people affected by health consequences from the high frequency of sitting time (Jochem, Schmid, & Leitzmann, 2018).

Measurements of Sedentary Behaviour

The research of SB always starts with measurement and the methods are in general divided into two categories: self-completion measures (e.g., self-reported questionnaires and diaries) and objective measurements (e.g., accelerometery and posture monitors) (Atkin, Adams, Bull, & Biddle, 2012). Objective measurements cannot differentiate between domains (university, transporting, or occupation) and modes (reading, watching TV, gaming). Therefore, it is necessary to establish self-completion questionnaires (Prince, Reed, McFetridge, Tremblay, & Reid, 2017). To design effective interventions, it is necessary to have information on where the performed behaviour occurs (domain-specific information), mainly because it seems that some discretionary behaviours are linked stronger to adverse health risks than others. For example, it is well known that the negative health effects attributed to watching TV can be mediated by unhealthy eating patterns, which is less common in people who spend more time engaging in other sedentary behaviours (such as reading, studying) (Pearson & Biddle, 2011). The advantage of self-completion questionnaire is that these can provide information of SB's location (Rezende, Rodrigues Lopes, Rey-López, Matsudo, & Luiz, 2014), whereas objective measurements are not able to do so (Healy et al., 2011).

Self-completion questionnaires can take various forms, one popular one is "single item" questionnaires which is easy to administer. These ask participants to predict their overall sitting time over a particular recall period (Craig et al., 2003). Single-item measurements have been recently found to underestimate

total sedentary time by 161.7 minutes per day compared to device-measured sedentary time (Prince et al., 2020). One example questionnaire form is the International Physical Activity Questionnaire (IPAQ) Short Form and asks questions like "During the last seven days, how much time did you spent sitting on a weekday?" and thereby, respondents state the duration in hours and minutes per day (Craig et al., 2003).

Another type of self-completion questionnaires are the domain-based questionnaires. Domain-based questionnaires are frequently used to assess overall sedentary time by summing up periods of time spent in SB (Aunger & Wagnild, 2020). Those combined measures of sitting time are more accurate for the overall sitting time than single-item measures and are easy to administer (Prince et al., 2020). A possible reason for that is, that it is easier for participants to recollect specific activities instead of total sedentary time (Healy et al., 2011). A disadvantage of domain-based questionnaires is the possibility for double-counting if a participant is multi-tasking (e.g., browsing on a tablet while TV viewing) but stating the behaviours independently (Aunger et al., 2020). One example questionnaire is the Sedentary Behaviour Questionnaire (SBQ) which asks for periods engaging in nine sedentary activities (e.g., watching TV) on weekdays and weekends (Rosenberg et al., 2010).

Inclinometers, accelerometers designed for the measurement of posture, raised due to the importance to differentiate sitting from standing. Therefore, it provides more accurate measures of time spent siting (Owen et al., 2010; Bames et al., 2012). However, a challenge for such measurements is distinguishing sedentary time from passive and active non-ambulatory postures, so true sedentary time from other similar behaviours such as sleep and non-wear time (Edwardson et al., 2017). The advantages and the disadvantages of the three described objective and self-completion questionnaires can be seen in Table 1.

Table 1

Characteristics of the Three Described Measurements

Measurement method	Advantages	Disadvantages	Example
Single-item Questionnaire	Easy to administer	Typically leads to underestimating total sedentary time	International Physical Activity Questionnaire (IPAQ)
Domain-based Questionnaire	More accurate than single-item measures, easy to administer	Risk for double-counting	Sedentary Behaviour Questionnaire (SBQ)
Inclinometer	Capable of differentiating sitting/ lying from standing postures	Cannot differentiate from passive and active non-ambulatory postures, can cause irritation to the user's skin, high financial cost	ActivPAL inclinometer

For this study, a self-completion measure was used, which was primary developed for occupational time. To evaluate the people's average SB and the duration of specific domains Van de Lagemaat (2018) developed the *Brief Questionnaire on Occupational Sitting (BQOS)*. The BQOS took the ecological approach as the framework, this framework also has been taken previously in the field of SB. The information gathered can be used to check the areas in which healthy behaviour can be promoted and where interruptions of SB can be planned. By including sitting times and the domain-specific information, there is an opportunity to obtain a coherent picture of a person's SB. The reason for the BQOS was that the previous questionnaires were unsuitable, due to focus on SB in different populations (e.g. children). Further, those that covered occupational SB were unsuitable due to a high administration time. The study of Van de Lagemaat (2018) showed that office workers sit about eleven hours per day

on average, with only six and a half hours of SB being work-related. This finding of the average sitting time matches with the results of Chau et al. (2013). Therefore, BQOS seems to be accurate.

The BQOS has some advantages: it is brief in the administration and divides the day chronologically in different domains, which offer a broad view into the test taker's day (from waking up to going to bed) and allows comparison between the people of the target group; additionally, it shows good psychometric properties. Therefore, it is feasible, shows consistency over time and measures total as well as domain-specific SB on an average level. In contrast, the questionnaire's obtained data cannot evaluate if a particular sitting pattern is healthy or unhealthy because the BQOS is not recording interruptions of extended SB. Furthermore, it provides limited information when the target group has a large variation in their daily life (Wißmann, 2019).

Importance of the study

For the first study, it was important to design a questionnaire (by extending the BQOS) that measures SB during leisure time, since a lot of the previous studies were focusing on children or looked only at TV watching or physical activity. Next, since it was shown that SB and physical activity are independent in terms of their health consequences, it was important to look at SB as a separate topic. Further, several studies focused on interventions to reduce SB in occupational time and, no reviews concentrated on the impacts of interventions on reducing non-occupational SB. However, non-occupational sitting time covers a large amount of total SB (Shrestha et al., 2019) and passive sedentary behaviour is more harmful to the psychological wellbeing which occurs mostly during leisure time. In addition to that, with an average of 7.5 hours per day SB seems to be an important topic for all EU-countries, including Germany, therefore it is important to provide a questionnaire in multiple language. Lastly, a questionnaire that measure all potential sedentary activities during leisure time is missing but it is important to investigate the content in which SB occurs, to develop intervention on reducing SB during leisure time by interrupting sedentary time. Hallgren et al. (2020) and Castin et al. (2015) stated a higher rate of interruptions can improve the mental health and cardio-metabolic health. In the second study, it was important use an ecological valid method to test the quality of the extended questionnaire to make a conclusion on the understandability and completeness of the questionnaire.

To test quality of the extended questionnaire the Three Step Test Interview (TSTI) methodology was used which is a specific method cognitive interviewing to test the items of the extended questionnaire by applying three steps. In the first step the interviewer observes and takes notes while the respondent is thinking out loud while reading, interpreting and answering the questions. The second step is a focused interview to remove gaps in observational data. In the last step the respondent is encouraged to add secondary data by expressing their considerations and opinions about the questionnaire (Hak, Van der Veer, & Jansen, 2004).

In the second study, two types of validity were partly considered. The first type was face validity and it shows how appropriate the content of test appears to be on the surface. The second type was content validity, which evaluates whether a test is representative of all facets of the construct. To achieve a valid result, the content of a questionnaire must cover all relevant parts of the topic that it aims to measure. If some facets are missing or irrelevant facets are included, the questionnaire is at risk. Face validity is similar to content validity, but face validity is a more informal and subjective measurement (Scribbr, 2019).

The goal of this study

The goal of this study was to extent the BQOS to measure SB during leisure time in more detail. The BQOS is a domain-based questionnaire and asked primary questions about SB during occupational time. Additionally, the BQOS asks about SB during leisure time, but details about specific domains and activities were missing. Firstly, it was necessary to find out which domains and activities were important to include in the questionnaire, therefore the first study asked interview questions to create a questionnaire that measure the activities of SB during leisure time. Secondly, based on the interviews, the BQOS was extended and tested by the Three-Step Test-Interview (TSTI) to find out if the people understood the questions and whether the extended questionnaire was complete. To make the extended questionnaire also applicable for other languages due to its relevance in all EU-countries, mainly a German translation of the questionnaire was tested.

The following two research questions will be investigated within this study:
1. **What are the sedentary activities during leisure time of employees?**
2. **How is the quality of the extended questionnaire regarding understandability and completeness?**

Method (First Study)

Study 1: Interview Sedentary Activities during Leisure Time

Participants

Participants were selected via opportunity sampling, thereby participants were friends and relatives of the researcher. Different friends and relatives were recruited for study 1 and study 2. The participants consisted of 10 employees of 8 different working areas. Selection for the interview had the inclusion criteria to be at least 18 years old and to have at least a part-time job that includes 20 working hours per week. The 10 interviews took place in April 2021 and they all lasted between 14 and 19 minutes. The sample consisted of six men and four women with a mean age of 30,1 (SD=8.01). Nine participants were German and one was Swedish. Six participants had an academic level of education and four participants had finish an intermediate Vocational School. An overview of the characteristics can be found in Table 2.

Materials and Procedure

There was a total of 16 interview questions. At first two demographic questions were given to ask for the age and profession of the participants. Next, seven questions were asked to get to know their daily schedule on a working day. For example, "When do they wake up", "When do they leave for work" and "What kind of activities are they performing between waking up and leaving for work" and if they are in these activities active or sitting or lying. In addition to that, it was investigated "When do they arrive home from work" and "When do they go to bed". Furthermore, a question was asked to get to know the activities between coming home and going to bed and if they are active or sitting or lying during these activities. A question was added to investigate changes in leisure time activities due to Covid-19. The other half of the interview consisted of five questions, investigated the activities of a day off for different time periods of the day: in the morning, afternoon and evening. The goal of the interview questions was to investigate the activities on a working day and a day-off, in which they perform sedentary behaviour or whether they are active. The last question asked whether the participant has any questions or comments regarding this interview.

Arrangements were made via telephone and text message. Participants were interviewed after they received and accepted the informed consent online (see Appendix A). Participants were told that the interview was designed to explore the domains of sedentary behaviour during leisure time from employees. All interview meetings (4 in German and 6 in English) took place online via Zoom or Skype and were audiotaped with the permission of the participants by the audio recording function of those programs. The first interview type was online due to the Covid-19 regulations to avoid personal contact and it seemed to be sufficient for this type of interviews to answer the questions in an appropriate way. Those interviews were transcribed and when necessary, translated by using the audio records. After the interview, participants received a document via email containing the information of the study and contact information of the researcher (see Appendix A). Participants received their transcripts within one week after the interview took place, thereby, if necessary, participants submitted corrections and comments within seven workdays. After the interview, interview data was anonymised and loaded into ATLAS.ti (version 9) for analysis.

Data Analysis

Transcripts were numbered from 1 to 10. The anonymised data (stating gender, age group, nationality, level of education and working hours) was analysed through inductive coding. In the method of inductive coding the codes derive from the raw data, hereby from all ten interview transcripts, which were analysed chronologically. Coding schemes were developed and described all mentioned activities by the participants during leisure time on a regular working day and during leisure time on a day off.

Codes were constructed to categorise data and related to quotes from the interviews. Regarding the intersubjectivity, after the first two interviews were coded and named, the codes were checked by the first supervisor. From the different interviews, the quotes were compared in a table to find differences and similarities and to define codes clearly. The codes were divided into two categories, namely active activities and inactive activities (research question 1). After all codes were finally made, they were checked by the first supervisor again. 16 categories of sedentary activities were found and which were prior described as the inactive activities. After reviewing all 16 categories critically and discussing it with the supervisor, some activities were deleted due to low prevalence, short duration (the code "powernap") or were combined, for example the codes "Playing instruments" and "Listening to music" were combined into the code "Music". From the reviewing, 11 categories are left.

Table 2

Characteristics of the Participants from the First Study

Participant	Age	Gender	Nationality	Level of Education	Working hours
1	23	Male	German	Academic	40
2	23	Male	German	Academic	20
3	31	Female	Sweden	Academic	40
4	21	Male	German	Intermediate Vocational School	40
5	23	Male	German	Academic	40
6	40	Male	German	Intermediate Vocational School	38
7	40	Female	German	Intermediate Vocational School	35
8	44	Female	German	Academic	40
9	26	Female	German	Intermediate Vocational School	40
10	30	Male	German	Academic	40

Results (First study)

Research Question 1: What are the sedentary activities of employees?

Eating/Drinking

"Eating/Drinking" was mentioned by all ten participants and varied between 40 minutes till 1 ½ hours. This category included their daily meals, going to the restaurant and drinking coffee or tea. One participant mentioned that sometimes on a day-off she take some time to drink coffee:

> "If it is possible, half an hour that I can sit down in peace just drink coffee."
> Female, age 40, participant seven.

All participants mentioned that they are sitting while they are having their meals, expect one participant mentioned that sometimes he stands while he is having his breakfast:

> "I am either sitting or standing since we have a standing counter on the kitchen: I like to standing I don't know maybe it's weird habit depends on the breakfast really."
> Male, age 23, participant one.

The following participant mentioned that she is eating something in the afternoon with her child:

"Then when we have time in the afternoon and I have to also cook something for the lunch then we eat together..."
Female, age 44, participant eight.

Two participants mentioned that they watch TV while they are eating:

"After an hour I get up for breakfast and watch TV during it."
Male, age 21, participant four.

"Um, I usually have a meal so for about 30 to 45 minutes. Sitting with my wife and sometimes we're watching a movie. During our meal. Again sitting then."
Male, age 23, participant two.

Watching TV

"Watching TV" was mentioned by nine participants and the amount of time varied from 1 hour till 5 ½ hours per day. Seven participants mentioned that they primarily watch TV in the evening. The category Watching TV included watching TV, watching YouTube and watching Netflix. The following participant mentioned a daily deadline where he and his partner start to watch TV:

"...we are basically watching TV at 8 o'clock in the evening that is basically our deadline."
Male, age 23, participant one.

Another participant mentioned that they watch TV before going to bed:

"So what I do, what I definitely do during the week and also on weekends almost always at least, before I go to bed, I just lie down on the sofa for an hour or so and watch a documentary or a series or whatever."
Male, age 40, participant six.

Smartphone Use

"Smartphone Use" was separated into three parts: "Phone Call", "Chatting on the phone", "Social Media".

Phone Call was mentioned by four participants and the amount of time varied from 45 minutes till an hour. The following participant mentioned that she is calling her mom every day for one hour:

"...I called my mom also one hour a day of my free time goes by talking with my mom on the phone."
Female, age 31, participant three.

Another participant mentioned that he and his girlfriend are calling their family individually but that sometimes he is wandering around while calling:

"So starting with 8:30-9 it's family time, so we are. Um, yeah, I'm [*sic*] I'm calling my family she's calling her family. This is done sitting. Although I have to say that I have this. Um, this thing that I'm wandering around while calling someone while I'm on the phone so not I'm not doing this sitting all the time."
Male, age 23, participant two.

Chatting on the phone was explicitly mentioned by just one participant and takes an hour. The following participant mentioned when he is on the phone he is also chatting with friends:

"...just being on the phone, so reading the news, or chatting with friends."
Male, age 23, participant two.

Social Media was mentioned two times and the amount of time varied between 30 minutes till one hour and 20 minutes. The following participant mentioned that he is on his phone on Instagram while he has a breakfast:

> "I'm checking Instagram on my phone or something. So it's a bit sometimes takes one hour when I have breakfast because I am also doing other things on my phone for instance..., but sometimes it's a bit parallel, you know?"
> Male, age 30, participant 10

Another participant also mentioned that after dinner he takes his time on social media and he is also checking his phone while having his breakfast on a day off:

> "Between 6:00 pm and 7:00 pm, I would say just chilling on social media while lying on my bed."

> "...but having breakfast and everything is maybe like 20 minutes more. But I don't really eat like the whole time. Just yeah, chilling a little bit, maybe checking social media on my phone as well."
> Male, age 23, participant five.

Reading

"Reading" was mentioned by six participants and varied 30 minutes till two hours. Five participants mentioned to read books and one participant to read only the news and one of the five participants mentioned to read both. Two participants mentioned that they read the news and of those two one of them also mentioned that he read books. The following participant mentioned that he is reading a book a lot while sitting or lying:

> "I'm reading a lot. I do that, yeah either sitting or before [*sic*] before sleeping. I'm lying in my bed and I read the book."
> Male, age 23, participant five.

The other participant mentioned that he is reading the news on a day-off:
> "So yeah, for about half an hour I would guess because I'm also reading the newspaper."
> Male, age 23, participant two.

Studying

"Studying" was mentioned by three participants and varied between one hour and four hours. Two of the participants were students and one participant is taking online courses. The following participant mentioned that he is usually studying for three hours per day:

> "Usually I'm studying for University, so it's that takes quite... three hours I would, I would say alone sitting."
> Male, aged 23, participant two.

Another participant mentioned to take online courses on Udemy:

> "Now recently I just bought some courses on Udemy. On something that I want to change my career too. So now I'm studying these courses online."
> Female, age 31, participant three.

Music

The category music was combined from "Playing instruments" and "Listening to music".

Playing instruments was mentioned by two participants and varied between 30 minutes till three hours. The following participant mentioned that he is playing music for two to three hours on a day-off:

" After that I might make 2-3 hours of music."
Male, age 40, participant six.

Another participant mentioned that she plays her guitar daily:

"I play guitar for like 30 minutes per day"
Female, age 31, participant three.

Listening to music was mentioned by one participant and this takes him 20 minutes per day. The following participant mentioned that sometimes he listens to music:

"...I am also doing other things on my phone for instance, or listening to music."
Male, age 30, participant 10.

Playing video games

"Playing video games" was mentioned by two participants and varied between five till eight hours. Participant mentioned to play video games on the console on a day-off. The following participant mentioned that he is sitting while playing video games:

"...then I actually sit down again in front of the TV, where I'm already playing video games. Depending on how I feel this can take 6,7 or 8 hours."
Female, aged 26, participant nine.

Another participant that he either meets friends to play video games or play with them online on a day-off:

"Yes, so definitely saying can also take a really long time. I would say 5 hours. Mostly also with friends."
Male, age 21, participant four.

Sedentary Behaviour outside

"Sedentary Behaviour outside" was mentioned by two participants and varied between two and four hours and was only performed once or twice a month. This category included sedentary activities in different locations such as cinema, theatre or pub. The following participant mentioned that he went to the cinema or theatre before Covid-19:

"...but then I met friends or went out on the restaurant. Sometimes Theatre or cinema, whatever after... after work."
Male, age 23, participant two.

The other participant mentioned also before corona she used to go to a bar after work:

"I remember those times then you could just like finish work and you would meet friends and go to a bar, go to a restaurant."
Female, age 31, participant three.

Online Surfing/Shopping

"Online Surfing/Shopping" was mentioned by two participants and varied between one hour and five hours. The following participant mentioned that he spent one hour per day on online shopping:

"And also buying a lot of online spending time on Amazon or eBay. Maybe one hour per day".
Male, age 30, participant 10.

Another participant that moved into a new flat mentioned it can take him five hours to browse the web for furniture:

"So if it is a day-off and we have eaten at 2 in the afternoon and it's bad weather, it could happen that we are browsing the web for furniture for.. to lets say 7."
Male, age 23, participant one.

Playing card games

"Playing card games" was mentioned by two participants and varied between one and two hours. Both participants are mothers and mentioned to play card games with their child. The following participant mentioned that since Covid-19 she is playing with her child card games with her child:

"...before Corona we used to go also to the swimming pool or do something else. But now we play game card games."
Female, aged 44, participant eight.

Writing

"Writing" was mentioned by one participant. The following participant mentioned that he is writing one hour on a day-off:

"And when I have my day-off I also write for about one hour."
Male, age 40, participant six.

The relation to the second study

At first, from the 10 interviews of the first study, 11 sedentary activities during leisure time were found (see Table 3). From these 11 categories, 11 questions were created and those questions were supposed to measure the duration of potential sedentary activities during leisure time (see Table 4). Next to that, the BQOS was extended with the 11 questions by asking for specific activities during leisure time. To measure the face- and content validity, the extended BQOS was tested by the TSTI, which was the aim of the second study. This was important to finally say, whether or not we have a valid and reliable tool that measure SB during occupational and leisure time.

Table 3

Frequency of the Inactive Activities

Inactive activities:	How many participants mentioned:	How often the code was used:
1) Eating/Drinking (Coffee, Tea, Restaurants)	10	44
2) Watching TV	9	25
3) Smartphone use (Phone Call/Chatting on the phone, Social Media)	7	7

Inactive activities:	How many participants mentioned:	How often the code was used:
4) Reading (news, books)	6	9
5) Studying	3	5
6) Music (active and passive)	3	4
7) Playing video games	2	7
8) Sitting behaviour outside the house (cinema, theatre, pub)	2	4
9) Online Surfing/Shopping	2	3
10) Playing card games	2	2
11) Writing	1	2

Table 4

Phrased Questions that were added to the BQOS for the Second Study

From the Inactive activity:	Phrased question for sedentary activities during leisure time:
1) Eating/Drinking	How much time do you spent sitting while eating or drinking? (Think of your meals, snacks and drinking a coffee or a tea.)
2) Watching TV	How much time do you spent sitting while watching TV? (Think of TV, Netflix or YouTube.)
3) Smartphone use	How much time do you spent sitting while using your smartphone? (Think of having a phone call, chatting or social media.)
4) Reading	How much time do you spent sitting while reading? (Think of reading a book or the news.)
5) Studying	How much time do you spent sitting while studying?
6) Music	How much time do you spent sitting while listening or playing music?
7) Playing video games	How much time do you spent sitting while playing video games?
8) Sedentary behaviour outside	How much time do you spent sitting on sedentary activities outside? (Think of cinema, theatre or pub)
9) Online Surfing/Shopping	How much time do you spent sitting while online shopping? (Think of Amazon or eBay)
10) Playing card games	How much time do you spent sitting while playing card games?
11) Writing	How much time do you spent sitting while writing?

Method (Second Study)

Study 2: Pre-testing the Questionnaire

Participants

The second interview type also selected participants via opportunity sampling, thereby participants were friends and family members who did not participate in the first study. The participants consisted of five employees of five different working areas. Selection for the interview based on the following inclusion criteria: having at least a part-time job that includes 20 working hours per week and to be at least 18 years old. By contrast, the exclusion criterium was that participants of the first study were not allowed to participate in the second study. Arrangements were made by telephone and text message. After signalling their willingness to participate, participants received an informed consent before the interview. The five interviews took place in July and August 2021 which all lasted between 15 and 22 minutes. The sample consisted of two men and three women with a mean age of 30.6 (SD=11.17). The Interview sample characteristics can be seen in Table 5.

For this study, the TSTI was used. Therefore, a concrete description of the methodology of the TSTI will follow:

Three-Step Test-Interview

The Three-Step Test-Interview (TSTI) is a method of pretesting a questionnaire for self-completion. The method of the TSTI is discussed because it is used in the second part of the study. After the first part of the study investigated the activities of SB during leisure time and 10 interviews were done, several codes were made regarding the category inactive activities. Considering the inactive activities, the BQOS was extended to measure the durations of employee's average durations of certain inactive activities during leisure time. The TSTI investigated the quality of the extended questionnaire and also of the existing BQOS. Therefore, it was investigated if all important activities were given or whether some were missing and if certain questions were understandable.

At first actual instances of interaction between the instrument and the respondents (the response process) before the reasons for this behaviour are examined. The TSTI includes the following three steps (Hak, Van der Veer, & Jansen, 2004):

1. Concurrent think aloud (Observation of response behaviour (controlled by the respondent))

2. Focused interview (Follow-up study to remove gaps in observational data (interviewer-controlled))

3. Semi-structured interview (Debriefing with the of gathering experiences and opinions (interviewer-controlled)).

It is important to gain insights in the thoughts and opinions of users of the questionnaire, so the thinking aloud method is used to make these thoughts observable. Since a large part of behaviour consists of "thinking" and therefore remains hidden from the viewer, the technique of thinking aloud is used to make it observable. Therefore, the first step includes the observation of the participants answering the questionnaire while thinking aloud to collect primary data on problems answering the questions being tested. In this step, apart from encouraging the respondent to think aloud, the interviewer avoids commenting and is focusing on watching and listening while taking notes. In the second step, the observer only considers the actions or thoughts that he has observed (in step 1) and about which he does not feel fully informed to fill in gaps in the observation data or to verify information. Therefore, the observer relies on the observations (notes) made in the first step. Respondents were asked to only report on what they have done in the first step and think, not what they think now. The last step is the only one

step in the TSTI where the respondent is "allowed" and even encouraged to add secondary data - accounts and reports of feelings, explanations, preferences. In this part, the respondents can express their considerations and opinions about the questionnaire. Further, the respondent can be encouraged to paraphrase questions and to share their comments on their definitions of terms, which would be a form of "cognitive interviewing". Lastly, the respondents can be asked about the main questions that are covered by the tested questionnaire. For example, if SB during leisure time is investigated, participants might describe his sitting time during leisure time in his own words (Hak et al., 2004).

Materials and Procedure

Based on the first interview type, the BQOS was extended by 22 questions, now containing 40 questions (see Appendix D). The extended version of BQOS was evaluated by using the TSTI. Therefore, the three steps of the TSTI were used. In the first step the participants were asked to think out loud while answering the questions of the questionnaire. To make it easier for the participants, one thinking out loud exercise was practised before the actual study. After the participants understood the technique, the participants answered 36 questions while thinking out loud and the interviewer stimulated the think out loud process if the participant did not share his thoughts. The first four questions were about demographics and therefore were not think out loud. Next to that the interviewer took some notes, especially in the cases where verbalizing was unclear. In the second step, with the taken notes, respondents were asked what they have done and thought during answering specific questions. Thereby, they were told, they should not include what they are thinking right now. After the second step, each participant was asked if they want to take a break of 5 minute. Afterwards, the last step was applied and the respondents expressed their feelings, explanations and preferences about the questionnaire and specific questions. Lastly, participants were asked to rephrase some questions in their own words.

Participants were interviewed after they received and accepted the informed consent personally (see Appendix C). Participants were told the quality of the questionnaire will be investigated, not them as a respondent. All interview (4 in German and 1 in English) meetings took place at the interviewer's home or participants' home with no other person present. For the second study, it was important to observe the reactions of the respondents and this was easier when being in front of each other. Therefore, friends and family members, who were often in personal contact with the interviewer, were taken for the second interview. Those interviews were note taken (for the second step of TSTI) and audiotaped after the participants gave permission. These interviews were when necessary translated and transcribed by using the audio records and notes. After the interview, participants received a document via email containing the information of the study and contact information of the researcher (see Appendix C). Participants received their transcripts within one week after the interview took place, thereby, (if necessary) participants submitted corrections and comments within seven workdays. After the Interview, interview data was anonymised.

Data Analysis

Transcripts were numbered from 1 to 5. The anonymised data (stating age group, gender, nationality, occupation, level of education and working hours) was analysed through inductive coding. Codes derived from the raw data, in this case all five interview scripts of the TSTI were analysed chronologically. Coding schemes were developed and described the participants' thoughts on the quality of the extended questionnaire. The codes were constructed to categorize the feedback and related to the quotes from the TSTI. After all codes were final, eight categories were found and discussed with the first supervisor. Those eight categories showed some problems and suggestions for improvement of the extended questionnaire. The category "Misunderstanding of the questions" included two different potential problems regarding understandability.

Table 5

Characteristics of the Participants from the Second Study

Participant	Age	Gender	Nationality	Occupation	Level of Education	Working hours
1	50	Female	German	Parking Garage	Hbo	42
2	24	Male	German	Postman	Intermediate Vocational School	38,5
3	26	Female	German	Doctor's assistant	Hbo	40
4	23	Female	German	Nurse	Intermediate Vocational School	35
5	30	Male	German	Lawyer	Academic	40

Results (Second study)

From the five interviews eight categories showed problems and suggestions for improvement of the extended questions.

Difficulties in Estimating the Time of Leisure Activities

In general, all five participants mentioned difficulties to mention specific duration for certain leisure time activities. Therefore, the participants mentioned to have difficulties to come up with specific times and also mentioned that there is a lot of variation and every day is different. For example, the fourth participant had difficulties to estimate the duration time spent sitting while watching TV:

"Well, it's not easy to estimate a specific duration. Not every day is the same."

Misunderstanding of the Questions

The third participant showed difficulties in the wording of the following question: "When do you usually leave **for** work?" was to her the same question as "When do you usually leave work?". Therefore, the participant had the following suggestion for these questions:

> "Actually, the second question is clear... but I would say for the first one.... I would say "At what time do you actually leave for work".
> Female, age 26, participant three.

Two participants had problems with differentiating two questions of the extended questionnaire:

1. How much time do you spent sitting while using your smartphone? (Think of having a phone call, chatting or social media.)
2. How much time do you spent sitting while reading? (Think of reading a book or the news.)

Those interviews were made with a German translation of the extended questionnaire and were perceived as the same activity. The reason is the meaning of the German word news, which means "Nachrichten". It has two meanings: It can mean news or (text) messages. The question about the

reading time followed directly after the smartphone use time and the first participant stated the following phrase:

> "For me it is the same thing…, it's just repetition, like using the smartphone or reading messages. Isn't it the same thing?"
> Female, age 50, participant one.

The fourth participant mentioned following phrase:

> "Hmm…Those questions are quite similar to each other. I also spent some time reading my text messages on the smartphone."
> Female, age 23, participant four.

Clarity for Sedentary Activities

The fourth participant stated that she is lying on her sofa while watching TV. The question "How much time do you spent sitting while watching TV? (Think of TV, Netflix or YouTube.)" was answered as follows:

> "I am not sitting while I am watching TV, so actually I am lying on my sofa."
> Female, age 23, participant four.

Therefore, in the third step the interviewer told the participant to also consider her lying time as her sitting time. This example showed that some people might not take lying into account as sedentary activities. This illustrates the importance to state in the instruction to add lying activities to the sitting time to make it clearer. Next to that, it can be helpful to add to some questions lying time next to sitting time. For example: "How much time do you spent sitting or lying while watching TV?

Missing Activities

Three participants added missing sedentary activities during leisure time in the extended questionnaire. To collect potential missing sedentary activities, in the end of the questionnaire the following question was given:
"Did you miss any sedentary activities that last for at least 15 minutes per day in this questionnaire?". The first participant mentioned the following two activities:

> "Some people are also preparing food while they are sitting. I cut my onions while I am sitting. And… Some people are also having a bath"
> Female, age 50, participant one.

The third participant mentioned the following activity:

> "When I think about it… smoking cigarettes is also an activity where you can also sit."
> Female, age 26, participant three.

The fifth participant mentioned the following activity:

> "Nothing is written about board games, right? So I would add board games to the card games."
> Male, age 30, participant five.

Overestimating the Duration on a Workday

The fifth participant showed an overestimation of the duration of his sedentary leisure time activities on a working day. The participant stated that he arrives home at 6:10 pm and is going to bed at 10 pm, however, the sedentary activities he mentioned after arriving home have a total amount of 13 ½ hours, so he clearly overestimated the durations of his activities.

After reviewing these results, the participant has been contacted and he stated that he misunderstood the question. He thought he is answering questions for a day-off.

Only Applicable for Office Workers

Two participants said that the following question of the existing questionnaire is annoying and only applicable for office workers: "How much time are you sitting on average between arriving at work and leaving work? (Think of working at your desk, in breaks, meetings, etc.)".
The first participant mentioned the following phrase:

> "Only a question for office workers...I am working in a parking garage where I don't sit a lot and every day is different, it's not only sitting in the office."
> Female, age 50, participant one.

The fourth participant mentioned the following phrase:

> " That's not applicable for nurses, we are not sitting that much. It is more a question for people working in the office."
> Female, age 23, participant four.

Both participants mentioned to sit between one- or two-hours during work. It was discussed with both participants that other occupations also include a lot of sitting time and the original questionnaire was made for office workers.

Not Applicable for Night Shifts

The fourth participant said that the questionnaire is not applicable for her because she is working as a nurse in night shifts from 9 pm to 7 am and is going to bed at 10 am. Therefore, it was not so suitable for her answer the leisure time activities after she arrives home from work. The fourth participant mentioned the following phrase:

> "After I come home I am not doing so much, I mostly just wanna sleep. This schedule to answer my leisure time activity is not applicable for me because I am working in night shifts."
> Female, age 23, participant four.

At first the participant the participant only considered the 2 ½ hours when she arrived home. Therefore, she only filled out 1 1/2 hour using her smartphone and 15 minutes eating. In the third step of the TSTI, I replied to the participant, that she should also consider the leisure time activities before she is going to work and therefore, she added more time for the answered and other activities.

Improvement for the Layout

The second participant mentioned suggestions to improve the layout in the third step of the TSTI.

"It would leave some space after every question... And then... I would use a bigger font to make it more readable. Yeah and I wouldn't put so much text on one paper I guess."
Male, age 24, participant two.

Changes for the Extended Questionnaire

Regarding the problems and suggestions for improvement based on the feedback of the TSTI, several changes were made on the extended questionnaire and one was made on the existing one. And overview of all changes of the items can be also seen in the Table 6.

From the existing questionnaire, the question "When do you usually leave for work?" was replaced by the question "At what time do you actually leave for work?".

In case of translating the extended questionnaire into German, the word "Nachrichten" should be renamed to "Zeitungen" synonym to avoid ambiguity.

To make it clearer that lying activities include sedentary activities, the instruction will state to consider lying and sitting activities. Next to that, for questions that can include lying activities, lying time will be included, for example: "How much time do you spent sitting while watching TV? (Think of TV, Netflix or YouTube.)" will be changed into "How much time do you spent sitting or lying while watching TV? (Think of TV, Netflix or YouTube.)"

To include board game as an activity, it will be added to the card game question: "How much time do you spent sitting while playing card games?" will be changed to "How much time do you spent sitting while playing card or board games?".

Considering the suggestions of missing activities, it is difficult to add the categories "preparing food" and "smoking" because those are activities that can also be performed while standing. Further, "board games" will be added to the activity card games and for specific activities, such as "bath taking", in the end of the questionnaire a category "Other" will be created where participants can add individual sedentary activities. To include more specific or individual sedentary activities, the questionnaire will include some empty space in the end of the activity questions which will be named "Other".

To avoid that employees of working areas beside an office environment, the order of the suggestions after the question will changed from: "(Think of working at your desk, in breaks, meetings, etc.)" to "(Think of breaks, working at your desk, meetings, etc.)".

Considering the difficulties for people working in night shifts, it is not suitable to ask these employees for their sedentary leisure time activities after they return home from work. Therefore, the questionnaire should also when applicable ask for participants' leisure time activities before they go to work. To make the questionnaire more applicable for participants working in night shifts, those participant should also consider their different sedentary activities before leaving for work, the instruction "When you return home think of the following domains regarding your time spent sitting:" will include lying and have the note following note after the instruction for people working in night shifts: "When you return home think of the following activities regarding your time spent sitting or lying (when you work in night shifts also consider the time before leaving for work):".

To improve the layout, after every question space will be left and the font size (12) will be increased into 14.

After a discussion with the two supervisors the inappropriateness of the activity Sedentary behaviour outside was renamed to Sitting Behaviour Outside the House. In addition, the belonging question was also renamed.

Table 6

Changes after the Feedback of the TSTI

Changed Items before edit:	Changed/Added Items after edit:
When do you usually leave for work?	At what time do you actually leave for work?
Was not in the Informed Consent of Study 2	Please consider as sedentary activities, sitting and lying activities.
How much time do you spent sitting while watching TV? (Think of TV, Netflix or YouTube.)	How much time do you spent sitting or lying while watching TV? (Think of TV, Netflix or YouTube.)
How much time do you spent sitting while using your smartphone? (Think of having a phone call, chatting or social media.)	How much time do you spent sitting or lying while using your smartphone? (Think of having a phone call, chatting or social media.)
How much time do you spent sitting while reading? (Think of reading a book or the news.)	How much time do you spent sitting or lying while reading? (Think of reading a book or the news.)
How much time do you spent sitting while listening or playing music?	How much time do you spent sitting or lying while listening or playing music?
How much time do you spent sitting while playing video games?	How much time do you spent sitting or lying while playing video games?
How much time do you spent sitting while online shopping? (Think of Amazon or eBay)	How much time do you spent sitting or lying while online shopping? (Think of Amazon or eBay)
How much time do you spent sitting while playing card games?	How much time do you spent sitting while playing card or board games?
Was not in the Extended BQOS	Here you can enter specific sedentary activities that are missing for you with the amount of time: Other:
(Think of working at your desk, in breaks, meetings, etc.)	(Think of breaks, working at your desk, meetings, etc.)
When you return home think of the following domains regarding your time spent sitting:	When you return home think of the following activities regarding your time spent sitting or lying (when you work in night shifts also consider the time before leaving for work):
Font size was 12 and each question had lack of space	Font size was increased to 14 and between each question space was left
Sedentary Behaviour Outside	Was renamed: Sitting Behaviour Outside the House
How much time do you spent sitting on sedentary activities outside? (Think of cinema, theatre or pub)	How much time do you spent sitting on sedentary activities outside home? (Think of cinema, theatre or pub)

Discussion

The purpose of this study was to extend the BQOS to measure sedentary behaviour during leisure time in more detail. Prior the BQOS only measured the total sitting time during leisure time but specific activities were missing. Therefore, the first study investigated the sedentary activities during leisure time by interviewing ten employees. The goal of the second study was to test the extended BQOS by the Three-Step Test-Interview (TSTI) and thereby to see if the participants understand the questions of the questionnaire and whether the questionnaire is complete.

The first study extended the BQOS with specific sedentary activities during leisure time by interviewing ten employees. The second study tested with the TSTI the quality of the extended questionnaire, regarding understandability and completeness and showed that some potential misunderstandings and incompleteness exist. After applying the feedback of the TSTI the validity of the extended questionnaire is still questionable because mostly translated data were used and the small sample size.

In line with the first study, the first research question was the following:

1. **What are the sedentary activities during leisure time of employees?**

Seven activities that were found in this study were already found in other studies. Four other activities were additional found. A lot of studies related to SB during leisure time focused heavily on watching TV. According to the American Time Use Survey (2019), citizens (aged ≥ 15 years) are watching TV for more than half of their leisure time. Further, in Germany watching TV had the longest duration for uninterrupted sitting (120 minutes per day) (Deutsche Welle, 2018). In this study, watching TV was during a working day the most time-consuming sedentary activity and confirmed the literature. Shrestha et al. (2019), mentioned that the use of computer/television screen, devices such as tablets, smartphones and gaming consoles has a great potential to increase SB during leisure time. On a day-off playing video games was the most time-consuming sedentary activity. In this study in line with the literature, playing video games and smartphone use were also found as sedentary activities. Clark et al. (2016) used the PAST-U questionnaire that asked about time spent sitting or lying down for work, study, travel, television viewing, leisure-time computer use, reading, eating and socialising. Confirming Clark et al. (2016), the interview found eating, reading and studying as activities. All participants of the interview mentioned that they sit while they are eating, except for one participant and two participants mentioned to watch TV while they are eating. Aunger et al (2020) mentioned the possibility of double counting as a disadvantage for such domain-based questionnaires. This issue of double-counting was not considered for both activities, therefore overlaps between these two activities are existing for the two participants. Sedentary behaviour outside was also found as an activity and looked explicitly for activities outside of the house that are sedentary such as going to the cinema. This is different from the questionnaire used by Clark et al. (2016) which used the term socializing and included physical active activities with friends and phone calling. However, activities of sedentary behaviour outside were only performed before corona started once or twice a month and therefore did not seem so relevant. In addition to the other studies, the interview found some other specific activities: online surfing/shopping, playing card games, writing and the category music (including playing instruments and listening to music).

2. **How is the quality of the extended questionnaire regarding understandability and completeness?**

In the second study with applied TSTI, the focus was more on the face validity, so whether the content seems to be appropriate for its aim. Therefore, the understandability of the questionnaire and its items were measured by participants. Regarding the content validity, it was only observed whether some

activities are missing which is related to the completeness of the extended questionnaire. However, it was not looked whether some items of the questionnaire were irrelevant, such as activities that were irrelevant.

In general, the TSTI showed that the extended questionnaire has some potential issues regarding the understandability and completeness. All participants in the second study mentioned to have difficulties mentioning specific duration for certain leisure time activities. Therefore, it is possible that the participants under- or overestimated certain activities, especially when they have variation in their leisure time. This was also suggested as a disadvantage by Wißmann (2019). He mentioned that the original BQOS provides limited information when the target group has a large variation in their daily life. Further, another possible problem was illustrated in the first study, when participants were doing more activities at the same time. For example, two participants reported that they watch TV while they are eating. Therefore, the possibility for double counting is given. This issue of double counting in domain-based questionnaires was already highlighted by the study of Augner et al. (2020) which mentioned this problematic as a disadvantage for domain-based questionnaire.

Regarding the understandability, several issues occurred during the TSTI of the extended questionnaire. One participant had difficulties to differentiate two questions. This issue showed that each question should be unique, clear and precise enough for participants to differentiate between the different questions. The importance of having questions and items that are clear and precise was highlighted by Regmi et al. (2016) to produce valid and meaningful results. After the feedback, the two questions were easy to differentiate from each other. Next, it is important to make the definition for sedentary activities clearer because one participant did not consider lying as a sedentary activity. Therefore, the instruction in the beginning will explicitly mention to include sitting and lying activities and several applicable activities should include the term lying in the questions. In addition, the participants did not mention it but after discussing all items with the two supervisors, the activity "Sedentary Behaviour Outside" and its belonging question are not clear enough, even though it was not mentioned by any participant, it seems contradicting because the formulation is not correct. To make it more concrete, it must call "Sitting Behaviour Outside the House". The need of having clear instructions and questions was also highlighted by Regmi et al. (2016).

Regarding completeness, participants had in the end of the questionnaire the possibility to mention missing activities. One activity and the belonging question was extended and two other suggested missing activities were not included due to the possibility to perform them while standing. To not miss any potential sedentary activities in the future, participants will have the opportunity at the end of the questionnaire to add their own activities. Another issue was the instruction that asked for the sedentary activities during leisure time because it asked for their activities after they come back home from work. However, one participant was working in night shifts and used to perform most of her leisure time activities before leaving for work. To also make the questionnaire applicable for people working in night shifts the instructions were adapted to also ask those participants for their sedentary activities before leaving for work. This circumstance that employees are having a lot of free time before leaving for work did not appear in the first study.

One participant overestimated the duration of his sedentary time activities on a working day, due to the fact that he misunderstood the question and answered for a day-off. This mistake will not be included as a potential problem of the questionnaire, instead it will be counted as an error of the participant. Two participants were annoyed by the following question of the original BQOS because they perceived it as unapplicable for their job: "How much time are you sitting on average between arriving at work and leaving work? (Think of working at your desk, in breaks, meetings, etc.)". The participant stated that the question is only applicable for office workers, however they still answered the question and filled in one and two hours of sitting during work. Even though that the two participants have jobs that requires to stand and move a lot it is unclear what exactly made the participant feel uncomfortable with the

question. Nevertheless, to avoid inconveniences, the order of the suggestions was changed into: "(Think of breaks, working at your desk, meetings, etc.)". To put breaks at first place seems to be applicable to all different types pf work.

After the improvements, the quality of the extended questionnaire considering the understandability and completeness, has to be distinguish between the two different versions. Regarding the completeness, the original and translated extended questionnaire seems to show a high content validity by considering the aspect of covering all potential activities and the completeness is independent from the language. A major limitation for the original English version is that four from the five participants performed the TSTI with a German translation of the extended questionnaire. Griffee (2001) argued when translating items from one questionnaire, it cannot be assumed that the translated items are valid, even when the original questionnaire items were validated. Further, validity is context specific and the cultural context of the second language is different and therefore, the meaning and intention of the word can be differently. Every translated questionnaire needs further analysis and pilot studies to confirm its validity. By taking into account that the goal of the TSTI was to test quality of the extended questionnaire, the mostly translated data represent a high risk for the face validity of the original questionnaire. As it was stated by Griffee (2001), validity is context specific and the meaning of words can be understood differently. This problem of different meaning of words in another language was shown in the second study by the ambiguity of the German translation of "news". Therefore, regarding the understandability, data for the original extended questionnaire is lacking and the face validity is doubtful. For the German version of the extended questionnaire the face validity should be high after implementing the feedback of the TSTI, so the German versions seems like a good representation for measuring SB during leisure and occupational time. For the English version, it is important to pre-test the extended questionnaire in English to find some potential misunderstandings. After that, a conclusion about the face validity of the extended questionnaire could be made. For the future research in SB during leisure time, it is important to have a valid tool.

Due to the bad health consequences of SB, it is important to design interventions to reduce sitting time and the foundation is based on valid questionnaires screening unhealthy behavior (Sallis, Owen, Fotheringham, 2000). When validating the extended questionnaire and using it on a larger sample, it should be possible to design effective interventions for reducing sedentary time during leisure time. Hallgren et al. (2020) suggested that higher rate of interruptions of SB can decrease the odds symptoms of self-reported depression and anxiety. Further, Castin et al. (2015) indicated potential benefits on cardio-metabolic health when interrupting sedentary time. Additionally, Shrestha et al., 2019 stated that passive SB is more harmful to the mental health which appear mostly during leisure time. By having a valid questionnaire, the activities in which the people are engaging in sedentary behaviour would be clear and by knowing the context, it is possible to come up with some interventions like interrupt sitting while watching TV. This could lead to reduce SB's bad health consequences. To be able to identify interruptions, it is important to use accelerometers which are accurate in measuring SB and next to them, a diary which can track the different activities (Ainsworth, Riviere, & Florez-Pregonero, 2018).

Limitation

A major limitation of the second study was that only one out of the five participants performed the TSTI in English and the other four were performed with a German translation of the extended questionnaire. Other limitations were the small sample size and the homogenous sample of not having employees that are doing voluntary work or informal care. Another limitation was that the working hours of the employees were similar high between 35 and 42 hours and therefore it is not clear how the extended questionnaire would perform on employees working fewer hours. People with less working hours could have different sitting patterns, might have a higher variation in their daily life and might engage more or less in sedentary activities because of having more leisure time. The BQOS offered restricted information when the target group had a lot of variation in their daily life (Wißmann, 2019). Another

limitation was the problematic of double counting which was not taken into account. When the possibility of double counting is existing and participants do more than one sedentary activity at the same time the correct sitting time cannot be measured. Further disadvantages are that the obtained data of the extended BQOS cannot evaluate if certain sitting pattern are healthy or unhealthy because it is not recording interruptions. In addition, the content validity only focused whether the questionnaire is missing activities but not whether irrelevant items are given.

Strengths

A strength of the study was that this study also developed and tested a translated version of the extended questionnaire and showed that after applying the feedback to have a German extended BQOS that is understandable and has a high face validity. Further, both versions of the extended questionnaire seem to be complete and therefore to cover all potential sedentary activities. All EU-countries seems to be affected by SB, therefore it is beneficial that measures SB during leisure and occupational time in multiple languages. The extended BQOS is a domain-based questionnaire and has the advantages that it is brief in the administration and separates the day chronologically in different domains. The advantage of domain-based questionnaires is that is that it measures overall sitting time more accurate than single-item measurements (Prince et al., 2020). The advantage of self-completion questionnaires is that, unlike objective measurements, they can differentiate between domains (Prince, Reed, McFetridge, Tremblay, & Reid, 2017).

Recommendations

It is recommended to pre-test the English extended questionnaire before using it on a larger target group to ensure a better validity. As Griffee (2001) stated, every translated questionnaire needs pilot studies to confirm its validity. The goal of the TSTI was to test the face- and content validity of the extended questionnaire, however with the sample the face validity was tested mostly on the German translation. When another study would show that the English extended questionnaire really measures the construct it claims to measure this would add a lot to its credibility. Therefore, using accelerometers, which are more precise in measuring sedentary activities and are able to identify interruptions, as an additional validation tool could be a great advantage when a diary is used next to it to track the activities (Ainsworth, Riviere, & Florez-Pregonero, 2018). Those self-completion questionnaires next to the objective measurements are beneficial because they can differentiate between domains (Prince, Reed, McFetridge, Tremblay, & Reid, 2017).

Conclusion

Measurements in sedentary behaviour during leisure time were lacking, even though SB during leisure time covers a large amount of total SB. The first study found by interviewing 10 employees 11 sedentary activities during leisure time. The existing BQOS that measured primary SB during occupational time did not measure specific sedentary activities during leisure time. Through the first study, the existing BQOS was extended with 11 questions asking employees for their time spent sitting or lying during certain activities. To test the quality of the questionnaire, considering the understandability and completeness, the TSTI was applied on five employees. After the feedback of the TSTI, the extended BQOS was improved. The questionnaire seems to be complete and include all possible sedentary activities during leisure time for both, the English and German versions. Regarding the understandability, the face validity of the German version extended questionnaire is high after applying the feedback of the TSTI. No conclusion could be made on the understandability and the face validity of the original extended questionnaire due to the small sample size of English speaker. To validate the English extended questionnaire, it is important to pre-test the English version to make a conclusion on the understandability and face validity of it. Nevertheless, it is beneficial to have a valid tool that measures SB during leisure and occupational time in multiple languages because many countries are affected by SB. In addition to that, by having a measurement in multiple languages a larger population for measuring SB is available.

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Appendix A: Informed Consent Study 1

Welcome to the research study!

I am interested in constructing of a questionnaire that intends to measure sedentary behaviour during leisure time. Therefore, there will be 16 interview questions that will ask you about your leisure time activities.

The Interview will be audiotaped to transcript and later code the answers. The audiotapes will be deleted after 7 days. Please be assured that your responses will be kept completely confidential. The study should take between 15-20 minutes to complete. Your participation in this research is voluntary. You have the right to withdraw at any point during the study, for any reason, and without any prejudice. If you would like to contact the Interviewer of the study to discuss this research, please e-mail s.maghsoudlou@student.utwente.nl. By clicking the 'I consent' button below, you acknowledge that your participation in the study is voluntary, you are 18 years of age, and that you are aware that you may choose to terminate your participation in the study at any time and for any reason.

o I consent

o I do not consent

Appendix B: First Study: Interview Questions

1. What is your age?
2. What is your profession?
3. How many hours a week do you work? How many days a week are you working? In which days are you normally working?
4. When do you usually wake up on a regular working day?
5. When do you usually leave for work?
6. What are your activities between waking up and leaving for work?
    a. What kind of activities are you performing?
        i. Are you sitting or lying?
        ii. Are you active?
        iii. For how long are you performing certain tasks?
        iv. Are you alone while performing these activities?
7. When do you usually get home from work on a regular day?
8. When do you usually go to bed after a regular working day?
9. What are the activities you perform between coming home from work and go to bed?
    a. What kind of activities are you performing?
        i. Are you sitting or lying?
        ii. Are you active?
        iii. For how long are you performing certain tasks?
        iv. Are you alone while performing these activities?
10. Did your leisure time activities on a working day change due to Covid-19?
    a. If yes, what were the changes?

11. When do you usually wake up on a day off?
12. What time do you usually go to bed on a day off?
13. What kind of activities are you performing in the morning?
    a. Are you sitting?
    b. Are you active?
    c. For how long are you performing certain tasks?
    d. Are you alone while performing these activities?
14. What kind of activities are you performing in the afternoon?
    a. Are you sitting?
    b. Are you active?
    c. For how long are you performing certain tasks?
    d. Are you alone while performing these activities?
15. What kind of activities are you performing in the evening?
    a. Are you sitting?
    b. Are you active?
    c. Are you alone while performing these activities?
    d. For how long are you performing certain tasks?

16. Do you have any questions regarding this interview or comments you would like to share?

Appendix C: Informed Consent Study 2

Welcome to the research study!

I am interested in testing of a questionnaire that intends to measure sedentary behaviour during leisure time. You will think out loud while answering 36 questions about sedentary behaviour during leisure and occupational time. After you answered, you will be asked about specific questions that were unclear. After that, you will be asked to evaluate the questionnaire by expressing your feelings, explanations preferences about the questionnaire. Finally, you have to rephrase some questions in your own words. The Interview will be audiotaped to transcript and code the answers. The audiotapes will be deleted after 7 days. Please be assured that your responses will be kept completely confidential. The study should take between 15-20 minutes to complete. Your participation in this research is voluntary. You have the right to withdraw at any point during the study, for any reason, and without any prejudice. If you would like to contact the Interviewer of the study to discuss this research, please e-mail s.maghsoudlou@student.utwente.nl. By clicking the 'I consent' button below, you acknowledge that your participation in the study is voluntary, you are 18 years of age, and that you are aware that you may choose to terminate your participation in the study at any time and for any reason.

o I consent

o I do not consent

Appendix D: Extended Brief Questionnaire on Occupational Sitting (BQOS)

What's your gender?

   o Man

o Woman

o Other

o Do not want to report

What's your age?

| |

Level of education (completed education)

o Primary school
o Secondary school
o MBO
o Hbo
o University
o Other, namely:

| |

How many hours do you work for this employer on average per week?

| |

For this question, assume an **average working day.**
The green questions are about times.
The blue questions are about time periods.
Example of answers to the green questions:
7.15 is entered as follows: Hours '7' and
Minutes '15'. You enter 22.00 as: Hours '22'
and Minutes '00' **Example of answers to the**
blue questions:
If you have sat for 20 minutes, please fill in: Hours '0' and Minutes '20'. If you have sat for
4.5 hours, please fill in: Hours '4' and Minutes
'30'
If a certain activity does not apply to you, you can enter 00 hours and 00 minutes.

Please, always fill in something.

	Hours	**Minutes**
When do you usually get up for work?		
When do you usually leave for work?		

How much time are you sitting on average in
the abovementioned period, from getting up
to leaving for work? (Think of breakfast,
watching television, etc.)
When do you usually arrive at work?
How much time do you spend sitting on your travel time to work?
(Think of the car, public transport, but don't count bikes).
When do you usually leave work?
How much time are you sitting on average between
arriving at work and leaving work? (Think of working
at your desk, in breaks, meetings, etc.)
When do you usually get home from work?
How much time do you spend sitting on your way back home?
(Think of the car, public transport, but don't
count bikes).
When do you usually go to bed after your workday?

When you return home think of the following
domains regarding your time spent sitting:
How much time do you spent sitting while
eating or drinking? (Think of your meals,
snacks and drinking a coffee or a tea.)
How much time do you spent sitting while
watching TV?
(Think of TV, Netflix or YouTube.)
How much time do you spent sitting while
using your smartphone? (Think of having a
phone call, chatting or social media.)
How much time do you spent sitting while
reading?
(Think of reading a book or the news.)
How much time do you spent sitting while
studying? How much time do you spent
sitting while listening or playing music?
How much time do you spent sitting while
playing video games?
How much time do you spent sitting on
sedentary activities outside? (Think of cinema,
theatre or pub) How much time do you spent
sitting while online shopping? (Think of
Amazon or eBay)
How much time do you spent sitting while
playing card games?
How much time do you spent sitting while
writing?

This question assumes an **average day off.**

(Such as the weekend or days off during the week).

The green questions are about times.

The blue questions are about time periods.

Example of answers to the green question

7.15 am you fill in: Hours '7' and Minutes '15'.

22.00 hours you fill in: Hours '22' and Minutes '00'

Example of answers to the blue question:

If you have sat for 2 hours, please fill in: Hours '2' and Minutes '00' If you have sat for 12.5 hours, please fill in: Hours '12' and Minutes '30'

If a certain activity does not apply to you, you can enter 00 hours and 00 minutes.

Please, always fill in something.

	Hours	**Minutes**
When do you usually get up on a day off?		
When do you usually go to bed on a day off?		
How much time do you spent sitting while eating or drinking? (Think of your meals, snacks and drinking a coffee or a tea.)		
How much time do you spent sitting while watching TV? (Think of TV, Netflix or YouTube.)		
How much time do you spent sitting while using your smartphone? (Think of having a phone call, chatting or social media.)		
How much time do you spent sitting while reading? (Think of reading a book or the news.)		
How much time do you spent sitting while studying?		
How much time do you spent sitting while listening or playing music?		
How much time do you spent sitting while playing video games?		

How much time do you spent sitting
on sedentary activities outside?
(Think of cinema, theatre or pub)
How much time do you spent sitting
while online shopping? (Think of
Amazon or eBay)
How much time do you spent sitting while
playing card games?
How much time do you spent sitting while
writing?

How often do you use facilities at work to sit **differently or less?**
Think of high conference tables, sit-stand desks, sitting balls, a knee chair,
office bike, etc.

- o Daily or almost daily
- o Once or twice a week
- o Monthly
- o A few times a year
- o Never
- o Other, namely:

Did you miss any sedentary activities that last for at least 15 minutes
per day in this questionnaire?
- o No
- o Yes, namely

Did you experience any difficulties while filling in this
questionnaire?
- o No
- o Yes, namely

Thank you for participating in this research. If you are interested in the results of the research, you can request it from [Sam Maghsoud Lou, s.maghsoudlou@student.utwente.nl].

Appendix E: After Feedback: Informed Consent Study 2

Welcome to the research study!
I am interested in testing of a questionnaire that intends to measure sedentary behaviour during leisure time. Please consider as sedentary activities, sitting and lying activities. You will think out loud while answering 36 questions about sedentary behaviour during leisure and occupational time. After you answered, you will be asked about specific questions that were unclear. After that, you will be asked to evaluate the questionnaire by expressing your feelings, explanations preferences about the questionnaire. Finally, you have to rephrase some questions in your own words. The Interview will be audiotaped to transcript and code the answers. The audiotapes will be deleted after 7 days. Please be assured that your responses will be kept completely confidential. The study should take between 15-20 minutes to complete. Your participation in this research is voluntary. You have the right to withdraw at any point during the study, for any reason, and without any prejudice. If you would like to contact the Interviewer of the study to discuss this research, please e-mail s.maghsoudlou@student.utwente.nl. By clicking the 'I consent' button below, you acknowledge that your participation in the study is voluntary, you are 18 years of age, and that you are aware that you may choose to terminate your participation in the study at any time and for any reason.
o I consent
o I do not consent

Appendix F: After Feedback: Extended Brief Questionnaire on Occupational Sitting (BQOS)

What's your gender?

- o   Man
- o   Woman
- o   Other

    o Do not want to report

What's your age?

Level of education (completed education)

- Primary school
- Secondary school
- MBO
- Hbo
- University
- Other, namely:

How many hours do you work for this employer on average per week?

For this question, assume an **average working day.**

The green questions are about times.

The blue questions are about time periods.

Example of answers to the green questions:

7.15 is entered as follows: Hours '7' and Minutes '15'.

You enter 22.00 as: Hours '22' and Minutes '00'

Example of answers to the blue questions:

If you have sat for 20 minutes, please fill in: Hours '0' and Minutes '20'. If you have sat for 4.5 hours, please fill in: Hours '4' and Minutes '30'

If a certain activity does not apply to you, you can enter 00 hours and 00 minutes.

Please, always fill in something.

	Hours	**Minutes**

When do you usually get up for work?

At what time do you actually leave for work?

How much time are you sitting on average in the abovementioned period, from getting up to leaving for work? (Think of breakfast, watching television, etc.)

When do you usually arrive at work?

How much time do you spend sitting on your travel time to work? (Think of the car, public transport, but don't count bikes).

When do you usually leave work?

How much time are you sitting on average between arriving at work and leaving work? (Think of working at your desk, in breaks, meetings, etc.)

When do you usually get home from work?

How much time do you spend sitting on your way back home? (Think of the car, public transport, but don't count bikes).

When do you usually go to bed after your workday?

When you return home think of the following activities regarding your time spent sitting or lying (when you work in night shifts also consider the time before leaving for work):

How much time do you spent sitting while eating or drinking? (Think of your meals, snacks and drinking a coffee or a tea.)

How much time do you spent sitting while watching TV? (Think of TV, Netflix or YouTube.)

How much time do you spent sitting or lying while using your smartphone? (Think of having a phone call, chatting or social media.)

How much time do you spent sitting or lying while reading? (Think of reading a book or the news.)

How much time do you spent sitting while studying?

How much time do you spent sitting or lying while listening or playing music?

How much time do you spent sitting or lying while playing video games?

How much time do you spent sitting on sedentary activities outside? (Think of cinema, theatre or pub)

How much time do you spent sitting or lying while online shopping? (Think of Amazon or eBay)

How much time do you spent sitting while playing card or board games?

How much time do you spent sitting while writing?

Here you can enter specific sedentary activities that are missing for you with the amount of time:

Other:

This question assumes an **average day off.**

(Such as the weekend or days off during the week).

The green questions are about times.

The blue questions are about time periods.

Example of answers to the green question
7.15 am you fill in: Hours '7' and Minutes '15'.
22.00 hours you fill in: Hours '22' and Minutes '00'

Example of answers to the blue question:
If you have sat for 2 hours, please fill in: Hours '2'
and Minutes '00' If you have sat for 12.5 hours,
please fill in: Hours '12' and Minutes '30'
If a certain activity does not apply to you, you can
enter 00 hours and 00 minutes.

Please, always fill in something.

	Hours	Minutes
When do you usually get up on a day off?		
When do you usually go to bed on a day off?		
How much time do you spent sitting while eating or drinking? (Think of your meals, snacks and drinking a coffee or a tea.)		
How much time do you spent sitting or lying while watching TV? (Think of TV, Netflix or YouTube.)		
How much time do you spent sitting or lying while using your smartphone? (Think of having a phone call, chatting or social media.)		
How much time do you spent sitting or lying while reading? (Think of reading a book or the news.)		
How much time do you spent sitting while studying?		

How much time do you spent sitting or lying while listening or playing music?

How much time do you spent sitting or lying while playing video games?

How much time do you spent sitting on sedentary activities outside? (Think of cinema, theatre or pub)

How much time do you spent sitting or lying while online shopping? (Think of Amazon or eBay)

How much time do you spent sitting while playing card or board games?

How much time do you spent sitting while writing?

Here you can enter specific sedentary activities that are missing for you with the amount of time:

Other:

How often do you use facilities at work to sit **differently or less?**

Think of high conference tables, sit-stand desks, sitting balls, a knee chair, office bike, etc.

- o Daily or almost daily
- o Once or twice a week
- o Monthly
- o A few times a year

o Never

o Other, namely:

Did you miss any sedentary activities that last for at least 15 minutes per day in this questionnaire?

o No

o Yes, namely

Did you experience any difficulties while filling in this questionnaire?

o No

o Yes, namely

Thank you for participating in this research. If you are interested in the results of the research, you can request it from [Sam Maghsoud Lou, s.maghsoudlou@student.utwente.nl].

Appendix G: Final German Extended BQOS

Kurzfragebogen zum Sitzen

Der Zweck dieser Studie ist es, herauszufinden, wie viel Zeit Sie sitzend oder liegend an einem durchschnittlichen Arbeitstag und einem freien Tag verbringen. Der kurze, anonyme Fragebogen dauert bis zu 5-10 Minuten. Die Forschung wird von Sam

Maghsoud Loud urchgeführt. Bevor Sie mit dem Fragebogen beginnen, bitten wir Sie um Ihre Erlaubnis, an der Studie teilnehmen zu dürfen.

Informierte Einwilligung: Einwilligungserklärung zur Teilnahme an der Forschung zum Sitzverhalten.

Ich erkläre, dass ich klar über die Art, die Methode und den Zweck der Forschung informiert wurde. Mir ist bekannt, dass die Daten und Ergebnisse der Untersuchung nur anonym und vertraulich an Dritte weitergegeben werden. Ich stimme völlig freiwillig zu, an dieser Forschung teilzunehmen. Ich behalte mir das Recht vor, meine Teilnahme an dieser Forschung jederzeit ohne Angabe von Gründen zu beenden.

Geben Sie an, ob Sie damit einverstanden sind (wenn Sie nicht einverstanden sind, können Sie diesen Bildschirm schließen).

- o Dem stimme ich zu

Was ist dein Geschlecht?

- o Mann
- o Frau
- o Andere

- o Möchten nicht berichten

Wie alt bist du?

Bildungsniveau (abgeschlossene Ausbildung)

- o Hauptschule
- o Realschule
- o Berufsschule
- o Hochschule/Abitur
- o Universität
- o Sonstige, nämlich:

Wie viele Stunden die Woche arbeiten Sie durchschnittlich pro Woche?

Nehmen Sie für diese Frage einen **durchschnittlichen Arbeitstag an.**
Bei den grünen Fragen geht es um Zeiten.
Bei den blauen Fragen geht es um Zeiträume.
Beispiel für Antworten auf die grünen Fragen:
7.15 wird wie folgt eingegeben: Stunden '7' und Minuten '15'.
Sie geben 22.00 Als:Stunden '22' und Minuten '00' ein.
Beispiel für Antworten auf die blauen Fragen:
Wenn Sie 20 Minuten gesessen haben, füllen Sie bitte aus: Stunden '0' und Minuten '20'.
Wenn Sie 4 1/2 Stunden gesessen haben, füllen Sie bitte aus: Stunden '4' und Minuten '30'
Wenn eine bestimmte Aktivität nicht auf Sie zutrifft, können Sie 00 Stunden und 00 Minuten
eingeben.

Bitte, füllen Sie immer etwas aus.

	Stunden	Protokoll
Wann stehem Sie normalerweise auf an einem Arbeitstag?		
Wann fahren Sie normalerweise zur Arbeit?		
Wie viel Zeit sind Sie am Sitzen im Durchschnitt in dem oben genannten Zeitraum, vom Aufstehen bis zur Abreise zur Arbeit? (Denken Sie an Frühstück, Fernsehen usw.)		
Wann kommen Sie normalerweise auf der Arbeit an?		
Wie viel Zeit verbringen sitzend auf Ihrer Reisezeit zur Arbeit? (Denken Sie an das Auto, öffentliche Verkehrsmittel, aber keine Fahrräder zählen).		
Wann verlassen Sie normalerweise die Arbeit?		
Wie viel Zeit verbrigen Sie im Durchschnitt sitzend zwischen dem Eintreffen zur Arbeit und dem Verlassen der Arbeit? (Denken Sie daran, an Ihrem Schreibtisch, in Pausen, Meetings usw.)		
Wann kommst du normalerweise von der Arbeit nach Hause?		
Wie viel Zeit verbringen Sie sitzend auf dem Heimweg? (Denken Sie an B. das Auto, öffentliche Verkehrsmittel, aber keine Fahrräder zählen).		
Wann gehen Sie normalerweise an einem Arbeitstag ins Bett?		
Wenn Sie nach Hause zurückkehren, denken Sie an die folgenden Bereiche in Bezug auf Ihre Zeit im Sitzen (Wenn Sie in Nachtschicht arbeiten, beachten Sie auch die Zeit vor der Arbeit):		

Wie viel Zeit verbringen Sie beim Essen oder Trinken im sitzen? (Denken Sie an Ihre Mahlzeiten, Snacks und trinken Sie einen Kaffee oder einen Tee.)

Wie viel Zeit verbringen Sie beim Fernsehen im sitzen oder liegen? (Denken Sie an TV, Netflix oder YouTube.)

Wie viel Zeit verbringen Sie sitzen oder liegen, während Sie Ihr Smartphone benutzen? (Denken Sie an einen Anruf, einen Chat oder Soziale Medien.)

Wie viel Zeit verbringen Sie beim Lesen im sitzen oder liegen?
(Denken Sie daran, ein Buch oder die Zeitung zu lesen.)

Wie viel Zeit verbringen Sie während des Lernens im sitzen?

Wie viel Zeit verbringen Sie im sitzen oder liegen, während Sie Musik hören oder spielen?

Wie viel Zeit verbringen Sie beim Spielen von Videospielen im sitzen oder liegen?

Wie viel Zeit verbingen Sie Draußen von zuhause im sitzen oder liegen? (Denken Sie an Kino, Theater oder Kneipe)

Wie viel Zeit verbringen Sie beim Online-Shopping im sitzen oder liegen? (Denken Sie an Amazon oder eBay)

Wie viel Zeit verbringen Sie beim Kartenspielen or Brettspiele im sitzen?

Wie viel Zeit verbringen Sie beim Schreiben im sitzen?

Hier kannst du noch mögiche weitere sitzende und liegende Aktivitäten mit der Dauer eintragen:

Diese Frage geht von einem **durchschnittlichen freien Tag aus.**
(Wie das Wochenende oder freie Tage während der Woche).
Bei den grünen Fragen geht es um Zeiten.
Bei den blauen Fragen geht es um Zeiträume.

Beispiel für Antworten auf die grüne Frage
7.15 Uhr füllen Sie aus: Stunden '7' und Minuten '15'.
22.00 Stunden füllen Sie aus: Stunden '22' und Minuten '00'

Beispiel für Antworten auf die blaue Frage:
Wenn Sie 2 Stunden gesessen haben, füllen Sie bitte aus:
Stunden '2' und Minuten '00' Wenn Sie 12,5 Stunden gesessen haben, füllen Sie bitte aus: Stunden '12' und Minuten '30'
Wenn eine bestimmte Aktivität nicht auf Sie zutrifft, können Sie 00 Stunden und 00 Minuten eingeben.

Bitte, always füllen Sie etwas aus.

	Stunden	**Protokoll**
Wann stehen Sie normalerweise an einem freien Tag auf?		
Wann gehen Sie normalerweise an einem freien Tag ins Bett?		
Wie viel Zeit verbringen Sie beim Essen oder Trinken im sitzen? (Denken Sie an Ihre Mahlzeiten, Snacks und trinken Sie einen Kaffee oder einen Tee.)		
Wie viel Zeit verbringen Sie beim Fernsehen im sitzen oder liegen? (Denken Sie an TV, Netflix oder YouTube.)		
Wie viel Zeit verbringen Sie sitzen oder liegen, während Sie Ihr Smartphone benutzen? (Denken Sie an einen Anruf, einen Chat oder Soziale Medien.)		
Wie viel Zeit verbringen Sie beim Lesen im sitzen oder liegen? (Denken Sie daran, ein Buch oder die Zeitung zu lesen.)		
Wie viel Zeit verbringen Sie während des Lernens im sitzen?		
Wie viel Zeit verbringen Sie im sitzen oder liegen, während Sie Musik hören oder spielen?		
Wie viel Zeit verbringen Sie beim Spielen von Videospielen im sitzen oder liegen?		
Wie viel Zeit verbingen Sie Draußen von zuhause im sitzen oder liegen? (Denken Sie an Kino, Theater oder Kneipe)		
Wie viel Zeit verbringen Sie beim Online-Shopping im sitzen oder liegen? (Denken Sie an Amazon oder eBay)		
Wie viel Zeit verbringen Sie beim Kartenspielen or Brettspiele im sitzen?		
Wie viel Zeit verbringen Sie beim Schreiben im sitzen?		
Hier kannst du noch mögiche weitere sitzende und liegende Aktivitäten mit der Dauer eintragen:		

Wie oft nutzen Sie Einrichtungen bei der Arbeit, um anders oder weniger zu **sitzen?**

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Denken Sie an hohe Konferenztische, Sitz-Steh-Schreibtische, Sitzbälle, einen Kniestuhl, ein Bürofahrrad usw.

- o Täglich oder fast täglich
- o Ein- bis zweimal pro Woche
- o Monatlich
- o Ein paar Mal im Jahr
- o Nie
- o Sonstige, nämlich:

Vermissen Sie in diesem Fragebogen sitzende Aktivitäten, die mindestens 15 Minuten pro Tag dauern?
- o Nein
- o Ja, nämlich:

Hatten Sie Schwierigkeiten beim Ausfüllen dieses Fragebogens?
- o Nein
- o Ja, nämlich:

Vielen Dank für Ihre Teilnahme an dieser Forschung. Wenn Sie an den Ergebnissen der Forschung interessiert sind, können Sie es bei [Sam Maghsoud Lou, s.maghsoudlou@student.utwente.nl] anfordern.