Office Workers' Perspectives on Physical Activity and Sedentary Behaviour: A Qualitative Study

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Abstract

Background

Office workers spend a significant part of their workday in a sedentary position. Interventions that aim to reduce sedentary behaviour and increase physical activity insufficiently take into account individual perspectives – including beliefs and values – that influence behavioural choices. This study aimed to gain an in-depth understanding of office workers' perspectives on physical activity and sedentary behaviour.

Methods

Sixteen Dutch office workers (50% female) from different professions consented to participate in semi-structured face-to-face interviews in March 2019. To facilitate the interviews, participants received a sensitizing booklet one week before the scheduled interview. The booklet aimed to trigger them to reflect on their physical activity and sedentary behaviour and on their values in life. All interviews were audiotaped, transcribed verbatim and coded following codebook thematic analysis.

Results

Six themes were identified: 1) beliefs about health effects are specific regarding physical activity, but superficial regarding sedentary behaviour; 2) in addition to health, social- and work-related values are also given priority; 3) motivations are related to the value 'health' and the valence and time frame of outcomes; 4) attitudes are diverse and depend on previous experiences, underlying values, and the situation; 5) perceived barriers depend on internal and external factors; 6) supporting factors are related to the social-, physical- and information environments.

Conclusions

Office workers' perspectives on physical activity and sedentary behaviour are related to beliefs about health effects, the prioritization of personal values, short- and long-term motivations, attitudes, perceived barriers, and supporting factors. Together, these factors seem to play a role in office workers' behavioural choices. Interventions that aim to reduce sedentary behaviour and increase physical activity among office workers could be improved by emphasizing short-term positive effects – including mental health effects – of physical activity, providing information about long-term health effects of sedentary behaviour, framing physical activity as congruent with values, and supporting value-congruent choices.

Introduction

Office workers spend a significant part of their workday sitting behind their desk. High levels of sedentary behaviour and low levels of physical activity put office workers at increased risk for non-communicable diseases and premature mortality (1–5). As physical inactivity behaviour is driven by a complex interplay of individual and environmental factors (6–9), interventions often target these factors to increase

physical activity levels and reduce sedentary time (10). Consequently, multi-component interventions targeting a range of factors appear to be most successful in changing these behaviours (7, 11, 12). However, a dimension that is generally underemphasized in existing interventions is the role of individual perspectives, including values, that influence decision-making processes. Individuals regularly make decisions about physical activity and sedentary behaviour, for instance concerning the kind of activity, frequency of exercise, and way of commuting. If individual perspectives were to be taken into account in the design of interventions, outcomes could be further improved (13–15).

Individual values are critical motivators of behaviours and attitudes, although their impact is rarely conscious (15). It is the relative importance of multiple values that guides individual behaviour (15). Individual beliefs drive behaviours as well. If individuals do not believe that particular behaviour (e.g. sedentary behaviour) negatively impacts health, or if they lack this knowledge, behaviour change is unlikely. Therefore, it is essential that intervention content, and particularly educational information about it, confirms existing correct beliefs, corrects incorrect beliefs, and fills important knowledge gaps (16, 17).

The alignment of interventions to individuals' perspectives can support individuals in making more deliberate and autonomous choices in which they make trade-offs between different choice aspects and consider their value priorities (18–20). Such active and value-congruent choices are considered increasingly important in public health and medical healthcare (21, 22) and are assumed to increase individuals' commitment toward health-related goals (e.g. being more physically active or less sedentary); consequently, active choices could induce more permanent behaviour change (20, 23, 24).

Studying individual perspectives related to physical activity and sedentary behaviour may provide insights that can ultimately empower individuals to make more active and value-congruent choices about their behaviour. To date, studies into individual perspectives on these behaviours have mainly focused on perceived barriers and facilitators (e.g. (25–28)). A qualitative study by Segar et al. (2017) investigated values, beliefs, and goals regarding physical activity, but only among women (29). To our knowledge, no previous qualitative studies have specifically investigated the perspectives of relatively sedentary individuals on this subject. Therefore, the current study aimed to gain an in-depth understanding of office workers' perspectives – including their beliefs and values – on physical activity and sedentary behaviour.

Methods

Study design

In this qualitative study, we conducted sixteen semi-structured face-to-face interviews with Dutch office workers. In accordance with local regulatory guidelines and standards for human subjects' protection in the Netherlands (Medical Research Involving Human Subjects Act), our study was exempted from review by Amsterdam UMC's medical research ethics committee (2019.086).

Study participants and recruitment

We recruited adults with a sedentary profession (e.g. in secretary, finance, or research), aged between 25 and 65, who had a mastery of the Dutch language and practiced their sedentary profession ≥ 20 hours a week. Exclusion criteria – which participants assessed themselves – included being pregnant, having an increased risk for cardiovascular diseases, suffering from a chronic disease, having a medical condition that limits physical activity, or knowing the interviewer (LL) personally. Participants were recruited through social media (LinkedIn, Facebook), printed flyers in supermarkets, universities and bank buildings in Amsterdam, the Netherlands, and two authors' networks (JJ and OD). The recruitment message specified the study aim and exclusion criteria. We initially used convenience sampling, which resulted in mostly women registering for participation. To obtain a more diverse sample with regard to gender, we adapted the recruitment flyers to recruit an additional number of men. All participants provided verbal informed consent.

Procedure

One week before the scheduled interview, participants were sent a sensitizing booklet that triggered them to reflect on their physical activity and sedentary behaviour and on their values in life, which was intended to facilitate the interview (30, 31) (Additional file 1). The assignments in the sensitizing booklet asked participants to: (a) describe timelines for a regular workday and a weekend day regarding the type and level of physical activity, as well as standing behaviour and sedentary behaviour; (b) select personal values and characteristics from a list (Additional file 2); (c) select the five values or characteristics most important to them; and (d) indicate whether those five values or characteristics positively or negatively influenced their levels of physical activity and sedentary behaviour. As from now, we will refer to values and characteristics as 'values', since the listed characteristics (e.g. 'ambition' and 'responsibility') can be regarded as values. We asked participants to bring the completed booklet to the interview as a reference. To avoid receiving socially desirable answers, we did not ask them to hand in their booklet.

The interview guide (Additional file 3) contained predefined questions, but also allowed participants to elaborate on a particular subject. The interview started with questions about the participant's profession and working hours. Subsequently, participants were asked about their physical activity and sedentary behaviour on a regular weekday (e.g. way of commuting, stair and elevator use, sitting time at work, number and type of breaks) and on a regular weekend day. They could use the notes in their sensitizing booklet in their descriptions. Next, questions were posed about the participant's beliefs (i.e. cognitions of the way things are related (17)) and barriers, and about supporting factors (i.e. facilitators and needs) regarding physical activity and sedentary behaviour in their social and physical environments. Prompts were used to gain a deeper understanding of participants' perspectives. Values (i.e. what individuals consider important in life (15)) were discussed at the end of the interview, based on the value-exercise in the sensitizing booklet. After the interview, demographics were obtained through a questionnaire.

The interview guide and sensitizing booklet were pretested by one researcher (LL) on two other researchers (JJ & OD); this resulted in minor adaptations. All interviews were conducted in March 2019 and took place at the participants' workplace or their homes. Interviews lasted 53 minutes on average (range: 43–66 minutes) and participants received a €20 gift card for their participation. All interviews

were conducted by the same researcher (LL), a female office worker (PhD candidate) with a background in Social Psychology and previous interviewing experience.

Data analysis

All interviews were audiotaped and transcribed verbatim using the software package F4transkript (Audiotranskription, Germany). After each interview, the interviewer wrote a summary, including field notes, to assess whether new beliefs, values, motivations, attitudes (i.e. degree to which an individual's evaluation is favourable or unfavourable (32)), barriers or supporting factors arose. A total of sixteen interviews were conducted; no additional key insights emerged in the last few interviews, indicating that data saturation had been reached. We analysed the data in ATLAS.ti, using codebook thematic analysis, a method to identify, analyse, and report patterns in the data (33, 34). This method allowed both inductive and deductive analysis (35).

As described by Castleberry and Nolen (2018), thematic analysis starts with *compiling*; this step consisted of data transcription and familiarization with the data. In the second, *disassembling* step, an inductive coding approach was used: four researchers (LL, ID, JJ, OD) open-coded half of the interviews ($n = 8$). These codes were printed on Post-its and categorized into constructs (i.e. beliefs, values, etc.) in a meeting with the same four researchers until mutual agreement about categorization was reached. In the third step (*reassembling*), two researchers (LL, ID) used these constructs and codes to construct a structured codebook. All interviews – including the eight that were initially open-coded – were subsequently coded deductively by one researcher (LL) using the codebook. If none of the codes applied to quotes relating to perceptions in a transcript, either the definition of an existing code was changed, or a new code was created. Codebook adaptations were discussed within the research team to reach agreement. Themes were identified by analysing codes and corresponding data extracts; codes that shared a central concept were clustered into themes. The fourth, *interpreting* step, entailed re-reading the quotations belonging to each code and describing relationships within and across themes. In the last, *concluding* step, we described our conclusions regarding participants' perspectives on physical activity and sedentary behaviour. To check for completeness and accuracy, we compared our conclusions with the summaries made directly after the interviews; no major deviations were observed.

Results

Sixteen Dutch office workers (50% female) from different professions participated. Participant characteristics are shown in Table 1. Participants' mean age was 40.7 years ($SD \pm 9.9$); 63% were married or cohabitated; 56% had children; 88% had completed university education or professional education and all participants were born in the Netherlands. Nine participants (56%) exercised at least once a week. Participants' did not exactly know the national physical activity recommendation^[1]; fourteen participants slightly or severely overestimated the recommended amount or intensity of physical activity, and two participants underestimated it. Nine participants believed that they met the (self-perceived) physical activity recommendation; three participants indicated that they did not pay attention to the recommendation, and four participants believed that they did not meet the recommendation. Five

participants were dissatisfied or partly dissatisfied with their physical activity levels; three of them expressed a desire to be more active or less sedentary, and two said that they accepted their situation.

Table 1. Participants' characteristics

Participant ID	Gender	Age [†]	Marital status	Number of children	Educational attainment [‡]	Field of profession	Working hours [§]
P1	W	42	Married	2	Professional	Education	28
P2	W	25	Single	0	University	Pharmacy	40
P3	W	34	Cohabiting	1	Professional	Secretary	24
P4	W	34	Cohabiting	2	University	Research & consultancy	32
P5	W	32	Single	0	University	Research	36
P6	W	38	Single	0	Professional	Secretary	32
P7	W	32	Divorced	2	Professional	Management	32
P8	M	37	Married	2	University	Policy advisor	20
P9	M	45	Married	2	University	Finance	40
P10	M	55	Cohabiting	1	University	Finance	45
P11	M	60	Married	2	Professional	ICT	40
P12	M	38	Cohabiting	0	Professional	Finance	40
P13	M	41	Cohabiting	0	Professional	Finance	44
P14	M	62	Married	0	University	Finance	40
P15	W	54	Divorced	3	Secondary	Secretary	25
P16	M	42	Relationship	0	Secondary	ICT	36

Abbreviations: *W* woman, *M* man, *ICT* Information and communications technology

[†] Age in years

[‡] *Secondary*: Secondary education including higher school or leaving certificate/trade/apprenticeship; *Professional*: professional education including certificate/diploma; *University*: university education including university degree or higher

[§] Average number of working hours per week

Thematic analysis

We identified six main themes in our qualitative data, which related to participants' perspectives on physical activity and sedentary behaviour. The themes are described in the next section, illustrated by quotes.

Theme 1: Beliefs about health effects are specific regarding physical activity, but superficial regarding sedentary behaviour

When asked about the consequences of insufficient physical activity, all participants mentioned health risks (i.e. *hypertension, high cholesterol levels, arteriosclerosis, diabetes, cardiovascular diseases, cancer*).

[About the health risks of physical inactivity] "I think it increases the risk of cardiovascular diseases; and cholesterol levels; I think that your endurance will decrease when you're continuously sitting and if your endurance decreases, you might experience some form of mental imbalance earlier. I also think that the risk of other diseases increases, because it weakens your immune system. [P14]

Furthermore, they all explained that physical activity benefits *physical* health (i.e. *increased endurance, prevention of weight gain, reduction of stiffness, increased blood circulation, and positive effects on muscles and joints*) and most participants also mentioned *mental* health benefits (i.e. *higher energy levels, better resistance to stress, increased relaxation and a general feeling of satisfaction*).

I: "What do you like about going home by bike in the afternoon?"

P: "Well, the fresh air, I love being outside and it also gives me the chance to process my daily impressions, which makes me more relaxed when I arrive home." [P6]

Regarding sedentary behaviour, participants' beliefs were more superficial; almost all participants mentioned that too much sitting is 'bad' for one's health, often referring to the popularized media statement 'Sitting is the new smoking'.

"Sometimes you hear 'sitting is the new smoking', but I haven't really figured out why that is the case exactly, so to be honest I don't know whether it has to do with your sedentary position or because you're not physically active, but I've heard this saying so often that I assume it's true." [P8]

Still, most participants did not know *which* short- and long-term health effects were associated with high levels of sitting. A few participants were able to specify possible physical health effects (i.e. *increased stiffness or pain in the neck, shoulders or back, weight gain, reduction of strength and endurance, and reduced blood circulation*) or mental health effects (i.e. *tiredness and a reduced focus*), mostly relating to short-term effects.

Theme 2: In addition to health, social- and work-related values are also given priority

When asked about general values in life, participants most frequently mentioned *health, family, friendships, balance, and freedom*.

"A 'good life'... is being conscious right now as well as about the future, both for physical activity and healthy diet, as well as with your living circumstances." [P16]

"The urge to grow old and stay healthy, yes, I think that's what I am doing indirectly, well, to be happy you need to be healthy." [P9]

Some of those values, especially health, family, and friendships, were also discussed to some extent when talking about motivations (theme 3) and attitudes (theme 4). The value *health* was most frequently mentioned as a driver of physical activity, but other values were also mentioned in relation to physical activity, either directly (e.g. exercise for *pleasure*), or indirectly (e.g. being active in order to age healthily to stay with one's *family*). Sometimes, participants were ambivalent about values relating to physical activity. In most of these cases, engaging in physical activity for health reasons conflicted with social values (i.e. *family, friendships*) or with work-related values (i.e. *ambition, responsibility, performance, money*). For instance, several participants wanted to be physically active after work but chose to spend evenings at home, because spending time with family was also considered important.

I: "Do you see opportunities at work to be more physically active or to sit less?"

P: "We have exercise facilities [at work] but I don't feel like going for a quick workout during lunch or before or after work; after work I want to go home, eat and see my children." [P9]

Participants rarely talked about values in relation to sedentary behaviour.

Theme 3: Motivations are related to the value 'health' and the valence and time frame of outcomes

'Good health' was the most frequently mentioned motivation and reflected the value 'health'. When asked to clarify, participants specified their health-related motivations, which typically referred to short-term positive outcomes (e.g. *increasing endurance, keeping fit, having a healthy body weight, feeling good*), and occasionally to longer-term outcomes (e.g. *maintaining a healthy body weight and being physically active at an older age*). Other positive outcomes that participants claimed to strive for included *having fun, attaining specific achievements* (e.g. walk 10,000 steps a day) and *looking good*.

"Actually, I think I should exercise at least three to four times a week, just because it's better, it's healthier, and it may result in a good body shape [laughs]. You just want to keep looking good while aging, and maintain good endurance and good health." [P6]

[About the motivation to exercise] "I think that my biggest motivation is to look fit and to be fit." [P2]

Most motivations to engage in physical activity stemmed from a desire to achieve the aforementioned *positive* outcomes, indicating positive valence. Occasionally, motivations stemmed from a desire to prevent *negative* outcomes, indicating negative valence. Motivations to prevent negative outcomes were

typically related to long-term consequences (e.g. *gaining weight, getting physical complaints, and becoming ill*).

[About the motivation to exercise] "Currently, I am too heavy for my height, so yes, that was certainly an important motivation to work on it" [P7]

Motivations discussed by participants concerning sedentary behaviour generally applied to the short term (e.g. *reduce stiffness, move away from the computer screen, regain a better focus*). This short-term focus was also reflected in participants' beliefs about sedentary behaviour (theme 1).

Theme 4: Attitudes are diverse and depend on previous experiences, underlying values, and the situation

Participants expressed diverse attitudes toward physical activity, including exercise. Many positively evaluated physical activities due to positive previous experiences, or because certain activities corresponded with their underlying values; for instance, participants who valued *social connections* highly enjoyed playing team sports.

[About table tennis] "I really like this sport, I really enjoy it, [...] the game is really fun and the people are very nice as well." [P3]

Sometimes, participants expressed a neutral or somewhat negative attitude toward a certain physical activity (e.g. fitness or running); some of them still engaged in the activity for health reasons, reflecting *health* as a value.

I: "Do you enjoy going to the gym?"

P: "Well let's say it's not my favourite hobby, it's not the most challenging thing I can think of... maybe I would rather have a home trainer in my apartment (laughs), although it's important for me; I know it's beneficial for my health; I'm not the kind of person who stays at home when I have an off day; I will go just because it's important [to exercise]." [P12]

I: "You mentioned previously that you don't like doing sports; have you never enjoyed sports?"

P: "Well, I'm not very good at game-type sports [...], but I did enjoy lessons like aerobics; it helped me to build up my muscles and it made me enthusiastic. Currently, however, it's difficult to combine with work and my children; for sports lessons I have to be somewhere at a fixed time, and then I feel obliged and stressed to be there; so I can't really enjoy it." [P4]

Participants also expressed diverse attitudes toward sedentary behaviour. Negative previous experiences with prolonged sitting, such as physical complaints in neck and shoulders, were mentioned in relation to a negative attitude toward prolonged sitting. For some participants, this seemed to result in a positive attitude toward alternating between sitting and standing postures at work. Other participants had a more negative attitude toward alternating since they experienced tiredness when working in a standing posture. Finally, attitudes seemed to depend on the situation; attitudes toward sitting were more positive when

participants had already done something useful during the day (e.g. exercising or cleaning the house), or when sitting was accompanied by a relaxing activity (e.g. watching television).

Theme 5: Perceived barriers depend on internal and external factors

All participants indicated one or multiple barriers regarding physical activity or reduction of sedentary behaviour. Perceived barriers were either related to internal factors (i.e. *lack of motivation/energy/inspiration or physical complaints*) or external factors in the physical or social environment (i.e. *bad weather, lack of childcare or lack of social support*). Lack of time was a frequently mentioned barrier to physical activity and was mainly caused by competing interests (described in theme 2).

"I used to engage in sports quite often, but now I lack time and energy. It's also due to the informal care I've been providing for a long time; I couldn't combine the two any longer." [P16]

Some participants mentioned more barriers for physical activity than others; this seemed to be related to participants' values (i.e. more barriers were perceived when competing interests played a role) and the degree of motivation for physical activity (i.e. more barriers were perceived in the case of little motivation).

Perceived barriers regarding interruption of sedentary behaviour at the workplace often concerned high work pressure, inflexible work policies, lack of facilities such as sit-stand desks and unfavourable social norms (e.g. no other colleagues working in a standing position).

"Sometimes colleagues go for a short walk and invite others to join; I mostly say no due to work pressure" [P5]

[About sit-stand desks] "In general I think that those things catch on when you see others using them; then you think 'oh let's also try that once', while if nobody's ever using it, you don't want to be the only idiot using it." [P8]

Theme 6: Supporting factors are related to the social-, physical- and information environments

Participants mentioned factors that *supported* them in being physically active and less sedentary, and factors that *would support* them in these behaviours. Supporting factors mentioned regarding the social environment included positive social norms (e.g. relating to working in a standing position), active social activities, and social support – including encouragement – from the social environment. Some participants wished to receive more social support.

I: "How could your social environment support you to be more physically active?"

P: "It would help me if others invited me to come along [...]; it would support me if my partner and I exercised together; I would really enjoy that" [P3]

Regarding the physical environment, an inviting (built) environment, good weather conditions, activity trackers, and owning a pet were generally considered to encourage physical activity and less sedentary behaviour. At work, multiple participants wanted to have a sit-stand desk or more physical activity, including active breaks.

"The availability of facilities [at work], such as sit-stand desks and meetings rooms with a standing table, would support me [to stand up more often]" [P8]

Finally, multiple participants wished to (regularly) receive advice about easily applicable active behaviours, for instance through e-mails or newsletters from their employer, and some participants wanted to receive more information about the health effects of physical activity and interruption of sedentary behaviour, for instance through messages in a 'did-you-know-that...' format at the workplace.

"That's a role for employers [to provide information about physical activity and sedentary behaviour], because an employer wants his employees to be in good health [...], so it's beneficial if employers play a role in this. Either by increasing awareness or by facilitating equipment for their employees to be more physically active" [P13]

Discussion

Our study aimed to gain a better understanding of office workers' perspectives on physical activity and sedentary behaviour and, in particular, their beliefs and values. Our thematic analysis revealed six main themes. We found that participants' beliefs about health effects were specific regarding physical activity, but superficial regarding sedentary behaviour. We also found that in addition to health, social- and work-related values were also given priority. The remaining themes related to participant's motivations and attitudes, and to perceived barriers and supporting factors.

In line with psychological literature (15, 36-39), the beliefs, values, motivations, attitudes, barriers, and supporting factors mentioned by office workers in our study were interrelated. Together, these factors seemed to play a role in office workers' physical activity levels and sedentary behaviour. For instance, individual values such as *health*, *family*, and *pleasure* were related to motivations to be physically active, and attitudes toward certain activities were positive if those activities corresponded with underlying values. Furthermore, our results showed that participants perceived more barriers to physical activity if their motivation was low or if they had conflicting values. The latter is also reflected in previous studies among women (not specifically office workers), for whom family and caregiving responsibilities presented a major barrier to physical activity (29, 40). Together, these findings suggest that there is room for improvement for interventions by fostering awareness of potential value inconsistency and by linking physical activity goals to values such as health, family, and pleasure.

An interesting finding was that participants' beliefs about sedentary behaviour were superficial, and that their knowledge about consequences of sedentary behaviour – especially in the long term – was limited. This finding is consistent with previous studies on sedentary behaviour (41, 42) and may be explained by

the relatively recent scientific and public interest in excessive sedentary behaviour (43) and the fact that – as opposed to physical activity – quantitative public health guidelines on sedentary behaviour specifying cut-off points for adverse effects have been lacking up till now (44-46). Educating office workers about the potential health consequences of prolonged sedentary behaviour may motivate them to reduce sitting time.

Participants in our study were sometimes less physically active than intended because they occasionally experienced ambivalence between the value 'health' – which was strongly related to physical activity – and social- or work-related values. Segar et al. (2017) also reported that family and work were often prioritized over physical activity, although study participants were not specifically office workers (29). As it is thought that the relative importance of multiple values guides behaviour (15), it is tempting to assume that individuals' behaviour reflects the relative importance of their values. However, this may not be the case when individuals are not fully aware of their (conflicting) values and have not actively considered the relative importance of those values. Supporting individuals in clarifying their values and resolving ambivalence can help individuals make active choices about their behaviour that are in accordance with their most important values (47).

The finding that participants' motivations to engage in physical activity often concerned short-term outcomes is also consistent with previous studies (48-50). Previous studies reported short-term *mental* and *affective* outcomes as key motivators; however, in contrast to our findings, short-term *physical* health outcomes seemed to be less important in motivating physical activity (48-50). Participants' predominant focus on short-term outcomes may be caused by a general tendency to give heavier relative weight to payoffs closer to the present time when considering trade-offs between two future moments. This 'present-biasedness' (51) has previously been associated with physical activity behaviour (52). In addition to the time frame, participants' motivations were also related to the valence of outcomes: positive outcomes were mentioned more frequently than negative outcomes. This finding is in accordance with previous qualitative studies on physical activity motivations (49) and may be explained by general motivational orientation (i.e. general focus on gains or losses) (53). Alternatively, it might be that people associate physical activity with *positive* health outcomes because *increases* in physical activity are generally beneficial, whereas increases in many other health behaviours, such as smoking or alcohol consumption, are associated with *negative* health outcomes.

Strengths and limitations

The use of sensitizing booklets may have contributed to a deeper understanding of values and behaviour, as the booklets allowed participants to reflect on their values and behaviour prior to the interview (30, 31). However, our study was also subject to a few limitations. Although qualitative research is not primarily concerned with obtaining generalizable results (54), it should be noted that two profession fields – finance and secretary – were overrepresented in our sample, because participants invited their colleagues. Moreover, convenience sampling and use of a recruitment flyer that revealed the study focus may have resulted in a relatively high proportion of participants with interest in physical activity. However,

the proportion of participants who exercised at least once a week corresponded to the proportion in the Dutch adult population aged 18-64 years (55). Finally, our sample lacked diversity regarding ethnicity and educational level, although the latter is due to the relation between desk-bound professions and educational level.

Practice implications

To ensure that interventions are more closely aligned with office workers' perspectives, educational information could have a more explicit emphasis on short-term positive effects, including mental health effects (50, 56). Furthermore, it is essential to inform office workers about the long-term health effects of prolonged sitting, as this appeared to be an important knowledge gap (17). Interventions could include tools such as Motivational Interviewing (57-59) or the Disconnected Values (Intervention) Model (60-63) to support office workers in clarifying their values relating to physical activity and sedentary behaviour, which would empower them to make more active and value-congruent choices.

From a health-promotion perspective, an implication would be to frame physical activity messages so that conflicting values are viewed as being congruent, rather than conflicting, with physical activity. Segar et al. proposed developing physical activity messages that emphasize that time spent on physical activity can contribute to family responsibilities and that physical activity can be a way to connect with others (29).

Based on the barriers and supporting factors identified, employers seem to have a role in discouraging sedentary behaviour and promoting physical activity among office workers during working hours. Employers could provide equipment (e.g. sit-stand desks) and implement interventions that provide information about the health effects of prolonged sedentary behaviour and advice about easily applicable active behaviours or active breaks. Although this recommendation may seem evident and many employers already pay attention to this, there still seems room for improvement. These implications also apply to situations where office workers work from home, which is currently the case for many office workers because of the COVID-19 pandemic.

Conclusion

Office workers' perspectives on physical activity and sedentary behaviour are related to beliefs about physical and mental health effects, the prioritization of personal values, short- and long-term motivations, attitudes, perceived barriers, and supporting factors. Together, these factors seem to play a role in office workers' behavioural choices. These insights form an important building block for the development of interventions that better align with office workers' beliefs and empower office workers to make more active choices about physical activity and sedentary behaviour that truly reflect their values.

Declarations

Ethics approval and consent to participate

In accordance with local regulatory guidelines and standards for human subjects' protection in the Netherlands (Medical Research Involving Human Subjects Act), our study was exempted from review by Amsterdam UMC's medical research ethics committee (2019.086).

Consent for publication

All participants provided consent for publication.

Availability of data and materials

The data generated during the current study are not publicly available due to content that could compromise research participant privacy but are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

LL conducted the interviews and drafted the manuscript. LL, ID, JJ, and OD analyzed the qualitative data. DT, OD, JJ and EV conceived and supervised the study. DT, OD, JJ, EV and ID reviewed the manuscript. All authors read and approved the final manuscript.

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