Factors influencing blue-collar workers’ participation in Worksite Health Promotion Programs in transport and logistics: a qualitative study using the Theoretical Domains Framework (TDF)

Marc A W Damen (marc.damen@ou.nl)  
Open Universiteit Faculteit Psychologie en Onderwijswetenschappen  
https://orcid.org/0000-0002-7346-8697

Sarah I Detaille  
HAN-University: Hogeschool van Arnhem en Nijmegen

Josephine A Engels  
HAN-University: Hogeschool van Arnhem en Nijmegen

Annet H de Lange  
Open University of The Netherlands: Open Universiteit

Research article

Keywords: Blue-collar workers, transport and logistics, worksite health promotion programs, lifestyle intervention, participation, implementation, reach, Theoretical Domains Framework

Posted Date: November 18th, 2022

DOI: https://doi.org/10.21203/rs.3.rs-2044499/v1

License: © This work is licensed under a Creative Commons Attribution 4.0 International License. Read Full License
Abstract

Background

Blue-collar workers in transport and logistics report a high risk of developing chronic diseases, partly due to an unhealthy lifestyle. Worksite health promotion programs may be able to promote a healthier lifestyle, but participation by blue-collar workers in these programs is relatively low. As a result, the current study aimed to further examine psychological and contextual factors that can explain participation of blue-collar workers in these programs within the transport and logistics sector.

Methods

Semi-structured interviews were held with 32 blue-collar workers in transport and logistics in the Netherlands (94% male, 81% driver, mean age 48 (SD=11)). Interview guides were based on the Theoretical Domains Framework and were used to assess perceived determinants that influence participation. Interviews were transcribed and coded deductively to determine relevant domains, and inductively with the constant comparison method to determine key themes within and between relevant domains.

Results

From these codes seven themes emerged, namely: (1) information sometimes too abstract or too complex (2) it takes wake-up calls to make lifestyle priority, (3) autonomy and individual freedom are important, (4) distrust towards worksite health promotion programs, (5) doers instead of talkers, (6) need for personal contact and acknowledgement, and (7) little stimulation at home and at work.

Conclusions

The results revealed that the Theoretical Domains Framework proved to be a useful tool for developing the interview guide. All groups of possible determinants (capability, opportunity and motivation) could be assessed. With these insights we were able to formulate recommendations for companies to enhance the participation of blue-collar workers in worksite health promotion programs.

Background

Blue-collar workers generally have a lower life expectancy compared to white-collar workers (1,2). Moreover, they report more severe physical health complaints and a reduced work ability compared to other workers (3,4). Truck drivers, the largest group of blue-collar workers in transport and logistics, are no exception. They report a high risk of developing chronic diseases, such as cardiovascular diseases, diabetes and musculoskeletal disorders (5,6). Therefore, in most Western societies with a threatening shortage of practical skilled employees, there is a growing need for interventions to improve the health and sustain the work ability of blue-collar workers.
An important cause for the reported health problems in earlier research is the unhealthy lifestyle that blue-collar workers generally have (7,8,9). Long-haul truck drivers, for example, are twice more likely to smoke and to be obese than other workers (10). Worksite Health Promotion Programs (WHPPs) may be able to promote a healthier lifestyle for this target group. Recent systematic reviews show that WHPPs appear to have significant positive effects on blue-collar workers’ lifestyle and short-term health outcomes (11,12).

Participation, however, in WHPPs generally is lower among blue-collar than among white-collar workers (13,14,15). In the Netherlands, of the blue-collar workers in transport and logistics with a diagnosed health risk, such as an unhealthy lifestyle or health complaints, only 10.3% participate in an intervention (16). Low participation rates reduce the potential impact WHPPs may have on improving the lifestyle and health of blue-collar workers. Therefore, insight in factors that influence participation is needed to improve implementation or recruitment strategies.

However, as others have mentioned before, most attention in evaluation research goes out to the effectiveness of the programs, and not to the reach and enrollment of participants (17,18). If reach is included in the evaluation, researchers often only present numbers and general characteristics of participants without giving more insight into which underlying factors, such as psychological and contextual factors, influence participation (15,19).

Nonetheless, a few studies have investigated factors influencing blue-collar workers’ participation in WHPPs. Some of these studies quantitatively investigated the correlation between one or a few determinants and participation. Hunt et al. (20), for example, found that construction workers participated when they showed a high intention and a high self-efficacy to change fruit- and vegetable consumption. Similarly, Sorensen et al. (21) found that truck drivers and dock workers participated in a smoking cessation program when they showed a high intention and a high self-efficacy to quit.

Other studies assessed reasons blue-collar workers mention for non-participation. Examples of mentioned reasons are lack of time and opportunity to participate during working hours due to tight schedules (22,23), concerns regarding privacy (24,25,26), a negative health culture at work (27) and not seeing a role for the employer when it comes to lifestyle and health (28). In most of these studies determinants were assessed without using a theory; workers were only asked for reasons why they chose not to participate. This finding corresponds with the call of several authors for making more explicit use of theories and theoretical models in studying factors influencing behaviour in implementation science (see for example (29)).

To our knowledge, no study to date provides a theory-driven, integrated overview of determinants influencing blue-collar workers’ participation in WHPPs. Therefore, the aim of this study is to get a more thorough insight in which contextual and psychological determinants influence participation in WHPPs of blue-collar workers in transport and logistics, using the Theoretical Domains Framework (TDF) by Michie, Atkins, and West (30). Furthermore, we study how these determinants interact. Based on the results we discuss practical implications for the design and implementation of WHPPs for this target group.
Methods

Intervention

The WHPP that was evaluated in this study started with an online health questionnaire. Based on the questionnaire outcomes, participants were classified as being ‘at risk’ (having health complaints and/or having an unhealthy lifestyle) or ‘not at risk’ (no complaints and a healthy lifestyle). The workers at risk were invited to participate in a follow-up lifestyle program targeting the risks, for example a smoking cessation program, a weight loss program or a stress reduction program. All programs consisted of individual live or online sessions with a coach or dietician. The WHPP was offered by the Dutch Sector Institute for Transport and Logistics (STL). From the 11th of April 2014 until the 3rd of January 2021 a total of 12,422 blue-collar workers filled out the online health questionnaire at least once. Of the 4,310 blue-collar workers at risk, 931 participated in a follow-up lifestyle program.

Design

In this qualitative study we followed the protocol for investigating implementation problems developed by Atkins et al. (29). The consolidated criteria for reporting qualitative studies (COREQ) (31) was used as a checklist (see additional file 1).

We conducted semi-structured interviews with blue-collar workers in transport and logistics. In the interviews we asked which factors they thought influenced their decision whether to participate in both the health questionnaire, and the lifestyle program. Topics in interviews were based on the TDF by Michie, Atkins, and West (30). In the development of this model, the authors deducted 12 domains of determinants from 33 theories of behavior or behavior change. Through validation research by Cane, O’Connor & Michie (32) the model has been refined and 14 domains were detected (see table 1). TDF has proven to be useful as a framework for retrospective process evaluation (see for example (33)).

Participants

Participants in the study were Dutch blue-collar workers who were working in transport and logistics, such as truck drivers, couriers, warehouse workers, and crane operators. The approximate sample size for the interviews was 25–35 interviews. To get enough variation in respondents, we used a quota sampling method based on occupation, gender, age and participation in the WHPP. This way it could be ensured that key groups were represented in the sample (34).

Materials

To systematically develop the interview guide, we used the framework developed by Kallio et al. (35). The domains of the aforementioned TDF were adapted to the specific context and behavior. The interviews were used to assess which domains of the TDF were relevant in the decision to participate and to understand how these domains influenced participation. An example is the domain ‘beliefs about consequences’ that was operationalized into the question ‘what did you think the WHPP would yield?’ Another example is the domain ‘social influences’ that was operationalized into the questions ‘what do
you think people around you thought of your participation in the WHPP? Were you being stimulated or were you held back?’. The interview guide was critically reviewed by two experts in the field of WHPPs in transport and logistics and reviewed and agreed upon by the whole research team (see additional file 2 for the interview guide).

**Procedure and data-collection**

Four methods were used to recruit participants: by telephone, by e-mail, via HR-officers in a few transport organisations, and via an advert in a magazine for truck drivers. Telephone numbers and e-mail addresses were taken from a database of workers who had completed a health questionnaire and confirmed they were willing to participate in future research. The database was managed by the company delivering the WHPPs.

Workers who were willing to participate were informed by the researcher on the phone or face to face about the research, its goals, topics in the interview, privacy regulations, and data management. When workers agreed, they were sent an informed consent which they then had to sign and an interview date was planned.

Of the 25 workers who were approached by telephone, 18 were willing to participate. Of the 83 workers who were approached by mail, six responded that they were willing to participate. Via HR officers another five respondents were recruited. The advertisement in the magazine resulted in another three respondents. Most respondents were male (94%) and were driver (81%). Mean age was 48 (SD = 11). Of the respondents 20 participated in a lifestyle program, nine only filled out the health questionnaire and chose not to participate in a program, and three didn’t participate in the WHPP at all (see additional file 3 for all respondent characteristics).

Almost all interviews were held by telephone due to Covid-19 lock-down regulations. Participants were either at home or driving while answering interview questions. The face-to-face interviews were at the workplace in a separate room with only the researcher and the participant present. There were two researchers and three student assistants involved in conducting the interviews with backgrounds in health and sociology, psychology and human resource management. All researchers were educated in basic interview skills. The interview guide was discussed in a session to make sure all interviewers agreed on all constructs in the interview guide.

All interviews were audio recorded. The duration of the interviews varied from 15 minutes to aproximately 1 hour. All respondents were given a gift voucher of €20 afterwards.

**Data-analysis**

Interviews were transcribed and after anonimization uploaded to Atlas TI. Two methods of analysis were used. First, following Atkins et al. (29), deductive coding was used to gain insights in which domains of determinants were relevant in explaining participation. Codes were therefore derived from the TDF. The constant comparison method was the second method used (see (36). We used this method to extract
themes within each domain. There were three steps of coding in this phase: inductive, axial and selective coding.

During the inductive step, two researchers (MD and SD) analyzed the same three interviews independently. Dilemmas and differences in coding were discussed. Following the protocol by Atkins et al. (29) a coding guideline was developed. The coding guideline was discussed and agreed upon in a meeting with the whole research team (see additional file 4). After this meeting two researchers (MD and SD) analyzed the other 29 interviews independently. Per domain inductive codes were added until saturation was reached. Saturation level was set at three interviews in which no new inductive codes were generated.

During the axial coding step, codes were merged that were similar and/or contained just one or two fragments. In a few cases codes were split up when they contained a lot of fragments. Each domain was covered by one to nine axial codes. The domain ‘intentions’, for example, was covered by four axial codes (feeling (no) urgency to change, openness to change, determined-doubt, and already involved (with other professionals) in health/ lifestyle activities). An expert on the TDF was consulted to solve some doubts. The final axial codes were discussed in the research team until consensus was reached. Secondly, all fragments within each code were summarized. Per axial code a statement was formulated that captured the essence of the code, and an illustrative quote was selected.

During the last step selective coding was applied by not only categorizing codes, but also analyzing how different codes overlapped and interacted. We looked for underlying patterns within the data by analyzing how contextual factors interacted with psychological factors and how this interaction led to (non-) participation. In the research team patterns were discussed until consensus on the themes was reached.

Results

Deductive coding yielded twelve domains that were relevant in explaining participation in WHPPs. Only the domains ‘reinforcement’ and ‘skills’ were not coded. An overview of the axial codes with frequency counts, corresponding statements and quotes can be found in additional file 5.

Seven underlying key themes were selected by the research team: (1) information sometimes too abstract or too complex (2) it takes wake-up calls to make lifestyle priority, (3) autonomy and individual freedom are important, (4) distrust towards WHPPs, (5) doers instead of talkers, (6) need for personal contact and acknowledgement, and (7) little stimulation at home and at work.

1. Information sometimes too abstract or too complex

For participants and non-participants alike what coaching entails was often unclear. The information they get is too abstract and does not give a clear picture of what they might expect. Participants mention they do not mind that they have no idea. They start a WHPP with an open mind and say that it does not hurt to try.
“I just started it with an open mind. I did not have any experience with it. I thought: it won’t hurt to talk about it” (respondent 28, male, intrastate truck driver/mover, 57 years)

“yeah, they called me, you know, well, the coach is going to look with you in terms of food an things like that. She did tell me then, but it was not, you know, getting clearer, like oh that’s it, you know” (respondent 29, male, truck driver in training, 19 years)

Information about the WHPP and registration procedures do not always reach the worker. Several workers mention they did not receive test results or an invitation to participate, and they do not seem to know the way how to apply for participation, when WHPPs are not directly offered. Simple procedures and facilitation are appreciated. Workers appreciate an employer who provides support and finds out what opportunities the worker has regarding participation in WHPPs. A health check organized by the employer is appreciated, because then workers do not have to arrange something with their general practitioner.

“and then you don’t need to see your doctor or whatever. But you still can find out with this check, hey, maybe there’s something the matter” (respondent 2, male, intrastate truck driver, 43 years)

2. It takes wake-up calls to make lifestyle priority

Lifestyle often does not have priority to most respondents. They seem to be occupied with more urgent matters, such as work-life balance and family issues, and everyday hassles. Especially interstate truck drivers say they do not have the time to participate, because they want to spend the little free spare time with their family. To this target group, lifestyle change seems less rewarding, making it less likely to participate in a WHPP.

“because of my private situation, while I was going through a divorce at that time, all kinds of things (…) so it’s because of stress and other things with more priority, that I didn’t have the stomach for it anymore” (respondent 1, male, warehouse worker, 51 years)

Because of the little profit they expect to gain from lifestyle change, blue-collar workers often only get into action when they experience health complaints. However, the feedback on a health questionnaire can serve as a wake-up call to get into action by making the worker aware of health risks he or she might face. A second reason for participation is getting older. Workers state that health becomes more important as they grow older. Sometimes this priority change comes forth from perceiving health deterioration in colleagues or family members of the same age. A third reason is becoming a parent or grandparent. The responsibility of being there for their offspring and being able to play with them, can be a motivator for participation.

“and certainly for the kids. What’s in it for them when they have a fat daddy who is lazy as hell, instead of a fit daddy who can play with them, lives healthy and has a positive attitude towards life?” (respondent 19, male, intrastate driver, 39 years)
When workers do not feel the urgency to change, they are not likely to participate. Workers mention that openness to change is essential to make a WHPP work. They seem to be waiting for the right moment to start the lifestyle change. This conviction may make it easy to postpone the start of a WHPP.

3. Need for autonomy and individual freedom

Respondents, in particular drivers, say they can be headstrong. They are used to making their own personal decisions, and they do not like others to interfere with their personal life and lifestyle. Employers are welcome to facilitate a healthy lifestyle, but the decision to make use of WHPPs is up to the employee.

“no, it’s your employer. It’s all good, but in life you’re on your own. It’s not up to them. That’s what I think” (respondent 6, male, intrastate and interstate truck driver, 35 years)

Most respondents seem to think that a coach is going to tell them what they must do and what they cannot do anymore. That may scare them off. An unhealthy lifestyle may be a way of coping with the stress and hard work conditions they face. During hard times they may not be willing to give up the pleasures in life, such as smoking, alcohol or high calory food. Moreover, they do not like other people to tell them what to do and they do not think a coach will tell them anything new.

“well, I know that I should eat more fruit. So yeah, I don’t need someone, not a dietician or I don’t know what. That, no, I’ll do it myself, you know. I’m trying to improve it” (respondent 17, male, crane operator, 56 years)

Even if they are open to new information, they prefer to get the information in a non-committal way, such as tips via e-mail. That way they can decide for themselves if, where, how and when they will use the information.

“No, I don’t want that, I’m not interested (...) I mean: if you have a number and it would bother me and I am able to call someone, well, yeah, that’s fine. Then I got a number that I can call (...) but I mean, then it’s up to me whether I call. And I’m not being called” (respondent 23, male, interstate truck driver, 55 years)

Although there is a need for autonomy, participants indicate that too much autonomy makes it easier to postpone participation. A coach who insists on making an appointment can be seen as pushy and cause reactance. On the other hand, with the right tone of insistence coaches may be able to stimulate participation or continuation.

“So the coach called me one day and said she wanted to see me, and I was like: just put some things for me in the e-mail’. But no, she really was like ‘no, I want to see you just once and then we’ll see how it goes from there, but I want to make an appointment. So she really insisted and, looking back, I think it was good she did” (respondent 20, male, interstate truck driver, 43 years)

4. Distrust towards WHPPs
Workers are sceptic about employer's intentions. Workers do not have faith that their health data is anonymous and workers are worried that their employer might use the data against them, for example to decide whether a contract will be extended or not. Workers who participate, in general, have the same distrust regarding privacy, but they mention they do not mind their employer knowing about their health status.

“how anonymous is this all? You’re doing it on the company’s computer. I don’t think it’s all very anonymous” (respondent 12, male, intrastate truck driver, 51 years)

Furthermore, caring for employee’s health by the employer is often not interpreted as such. Workers have the idea that the employer only cares about reducing absenteeism costs. This is especially true if an employer does not invest in healthy work conditions. This distrust may lead to a negative attitude towards WHPPs.

This scepticism not only targets the employers; coaches may be subject to mistrust as well. Workers may think there is a catch when they register for a WHPP. They think coaches do not care about the worker’s health and only care about making money.

5. Doers instead of talkers

Many workers seem convinced that talking does not solve the problem. When facing a problem, they believe that you should address the problem directly, instead of talking about it. This view makes them sceptic about what coaching would yield. If they want to change their lifestyle, they think they should just do it.

“yeah, I had the idea a bit that it would all be a bit woo woo, you know? That we would fill in some colouring pages or search for a quiet spot in the woods. And that it would all turn out good (...) I thought: that’s not going to help” (respondent 24, male, interstate truck driver, 57 years)

When workers do participate in coaching, they prefer practical assignments, practical advice and fun activities, such as competitions, group activities and health checks with feedback. Theoretical and reflective assignments are seen as burdensome, especially when feedback on the assignments is lacking.

“and maybe a bit more practical. Because a whole afternoon in a theory class, that’s not for truck drivers, I think” (respondent 18, female, courier, 41 years)

6. Need for personal contact and acknowledgement

Workers seem to need acknowledgement that working conditions are hard and that it is difficult for them to adopt a healthy lifestyle. They find it important that their employer (or coach) listens to them and shows he cares about the worker’s wellbeing. Personal contact seems conditional for acknowledgement: default solutions and default e-mails are not appreciated. Workers appreciate it when an employer thinks along or when a coach adjusts time and place of appointments to the worker’s wishes.
“it just created a relationship of trust instantly. I could just tell my story and I was being listened to. I found that very important” (respondent 9, male, intrastate truck driver/mover, 57 years)

If an employer invests in the wellbeing of his or her employees, the employee is willing to do something in return. For blue-collar workers working on your own lifestyle is something they are willing to do, if an employer invests in healthy work conditions. Adopting a healthy lifestyle is sometimes seen as a moral obligation towards the employer.

“You see, it’s an offer from the employer and he sticks his neck out for this, and I’m sure it will cost him something and yeah, I think you should participate then. Right? (...) It works back and forth a bit, you know (...) When they organise a party, I’m there as well” (respondent 17, male, intrastate truck driver, 52 years)

7. Little stimulation at home and at work

There seems to be a lack of social stimulation for blue-collar workers to adopt a healthy lifestyle. Workers mention that they are being laughed at by co-workers when eating a salad or taking a walk during lunch break. At home, partners, in general, agree with participation, but they do not seem really supportive in the lifestyle change. This makes it hard for the worker to start and maintain lifestyle change. They may get the feeling that they are on their own.

“yeah, I got laughed at on the road by co-workers. I was being called crazy for going for a walk in the evening. You’ve been working all day, aren’t you tired of working?” (respondent 22, male, interstate truck driver, 50 years)

Social support, however, is seen by blue-collar workers as an important stimulant for participation and lifestyle change. Group activities are mentioned as a way to maintain a healthy lifestyle. To see others working on their health can be uplifting. Especially when it comes to sensitive topics, such as burn-out, personal accounts may stimulate participation. When a worker recognizes complaints a co-worker describes and sees how a WHPP has helped him, this may help convince workers to participate.

“At a certain point I thought...there's a story (in a trucker magazine) of someone who'd gone through the same thing. I thought: “that's going to look a lot like me. Maybe I should fill out such a questionnaire” (respondent 24, male, interstate truck driver, 57 years)

Discussion

In this qualitative study TDF has been applied to gain more insight in determinants affecting participation of blue-collar workers in WHPPs in transport and logistics. Seven themes were extracted from the interviews: (1) information sometimes too abstract or too complex (2) it takes wake-up calls to make lifestyle priority, (3) autonomy and individual freedom are important, (4) distrust towards WHPPs, (5) doers instead of talkers, (6) need for personal contact and acknowledgement, and (7) little stimulation at home and at work.
As found in previous studies (37,38), we found that lifestyle often does not have priority for blue-collar workers. They only participate in WHPPs when they are already reporting health problems. Our analyses revealed that the urgency to participate can be enhanced by wake-up calls, such as a health risk assessment (cf. (39)). Another motivating factor is the worker's family role. When becoming a spouse, a parent or grandparent, a worker can feel more responsible to take care of one's own health. Therefore, to promote participation, companies can focus on family values in the recruitment phase (see for example (40)). A second implication of this finding is that WHPPs should start with a needs assessment or a project group to collect health themes that are important to workers. Furthermore, since lifestyle often is not priority for blue-collar workers, WHPPs should not be too narrowly focused on lifestyle, but rather take a more holistic approach to vitality, for example using a total worker health approach (41) or integrate lifestyle with safety programs (42).

We found that the feeling of autonomy and individual freedom is an important prerequisite for blue-collar workers. More studies underline the importance of a 'no pressure' policy when it comes to blue-collar workers (e.g. (43,44,40)). Blue-collar workers are used to making their own choices and can be attached to their individual freedom (45). They may not see a role for the employer in personal health issues (46,28). Röttger et al. (18) found that when the perceived social norm at work is that one should participate in WHPPs, this may result in reactance and non-participation among workers. Therefore, it should be clearly stated that the worker is in charge during the process. He or she chooses not only whether to participate or not, but also whether to comply with the advice coming from coach or trainer.

This preference for autonomy may seem contradictory to our other finding that workers seem sensitive to social influences, such as personal contact, acknowledgement and stimulation at work and at home. In many blue-collar work environments being concerned with one's weight or health may be seen as irrational or unreasonable (47,45,27,48). This may hinder participation. Companies could provide a culture in which health is common practice but should be careful not to push too much a lifestyle that may be too far removed from the worker's own lifestyle. Appointing lifestyle ambassadors, letting managers lead by example, talking about health with workers, offering acknowledgement and encouragement, and using worker's (success)stories in the promotion of WHPPs, may contribute to such a culture.

As found in previous studies (24,25,26), we found that concerns regarding privacy and distrust in the employer's integrity may play a role in the decision to participate or not. Surprisingly however, we found that both participants and non-participants did not seem to trust privacy regulations. Participants in WHPPs mentioned they simply did not care if their employers learned about their health status. For implementation, therefore, it seems important to outsource health questionnaires and individual coaching and clearly state how privacy is regulated. It may help when a worker meets the coach beforehand. The coach should preferably be someone workers can identify with. Furthermore, it seems important that the employer shows he cares about the employee's health. By investing in a healthy work environment, scepticism among blue-collar workers may be reduced.
Most blue-collar workers are practically-minded; doers instead of talkers. They may not see lifestyle coaching as an effective intervention for lifestyle change. Therefore, either recruitment should be more concrete about what coaching entails or more practical options should be offered, such as competitions, challenges and workshops.

Furthermore, the work environment should facilitate both participation in WHPPs and a healthy lifestyle. A lot of blue-collar workers do not participate, simply because they are not aware of the offer, or they do not know how to register, as was found in previous studies (e.g. (46,49)). Information often does not reach the worker. When it does, it may be too abstract or procedure may be too complex. Short and simple questionnaires, participation during working hours, convenient locations, and easy registration may contribute to a higher participation.

**Theoretical Implications**

TDF proved to be valuable for constructing the interview guide and for a first analysis of the data. We underline the importance of using theory in studying factors influencing behaviour in implementation science. TDF, being a consensus model of 33 theories of behaviour and behaviour change, helped mapping out all possible aspects relevant to explaining participation. We found the use of this framework helpful in diminishing blind spots (cf. (50)).

As researchers have noted before, the TDF is descriptive and interaction between contextual factors and psychological factors are not captured by the model (50). Some authors, therefore, suggest a less rigid application of the TDF (51) by combining deductive and inductive coding methods. We found the constant comparison method was a valuable addition to deductive analysis. It helped to generate overarching themes that created a deeper understanding of the behaviour studied.

The current study provides insight in factors influencing participation. To design an intervention for behaviour change, it would be necessary to estimate how widespread specific beliefs are among the target group and how strong the correlation is with actual participation. Some authors suggest (29,52) to assess the relevance of domains and codes by looking at high frequencies, evidence of strong beliefs, and the presence of conflicting beliefs. However, as others have mentioned before single responses may express what others take for granted or find hard to speak about (see (53)). For this reason, we chose not to qualify specific beliefs as relevant or irrelevant. Instead, with selective coding we integrated all axial codes into broader themes. It is possible to use formulated statements for each axial code (see additional file 5) in a survey study to quantitatively explore which specific beliefs are most widespread and which ones are correlated to participation. However, we think this study provides enough starting points for designing an implementation strategy. By continuous evaluation developers could check if the right determinants are being targeted and participation is being enhanced.

**Limitations**
Since we were interviewing, only factors that were consciously influencing participation were collected, like attitude or social support. More subconscious influences could sometimes be extracted from what respondents were implicitly saying. Nonetheless, studies investigating implicit factors, such as social marketing techniques or implicit social norms, could contribute to the findings in this study.

Respondents may also be unaware of the influence of contextual factors, such as organisation characteristics, implementation strategies or socio-political context. For future studies that want to investigate both psychological and contextual factors influencing behaviour, a refinement of the domain 'environmental context and resources' may be of added value. An implementation framework like that of Wierenga et al. (19), for example, may help diminish these blind spots. Furthermore, case studies in which contextual factors are studied between different companies may be of added value in explaining the interaction between context and psychological determinants, and in triangulating the findings from interviews.

Although we put much effort in reaching non-participants, this appeared to be the hardest group to reach. It could be that the distrust that plays a role in non-participation in WHPPs may also play a role in non-participation in this study. We were, however, able to reach blue-collar workers that filled out a questionnaire, but chose not to participate in lifestyle coaching. Furthermore, in the interviews a lot of drivers talked about social norms in the sector and opinions they hear from colleagues. In our opinion, this gave us sufficient insights in the attitudes that are prevalent among non-participating blue-collar workers.

Suggested implementation strategies to enhance participation can be tested in semi-experimental designs. Effectiveness of the WHPPs should be taken into account in these studies, since participation is not a goal in itself. Assuming that motivated workers are already reached with current strategies, it seems likely that by enhancing participation less motivated workers will engage. The chance of dropping out or falling back in old habits after participation, could be higher. The question whether higher participation rates actually lead to more impact of WHPPs, still needs to be answered.

**Conclusion**

To the best of our knowledge, this study is one of the first qualitative studies that uses theory to investigate determinants of participation in WHPPs by blue-collar workers. The theoretical domains framework proved to be a useful tool for developing the interview guide. All groups of possible determinants could be assessed that way. With these insights we were able to formulate recommendations for companies to enhance the participation of blue-collar workers in WHPPs.

**List Of Abbreviations**

**WHPP**

Worksite Health Promotion Program
Theoretical Domains Framework

Declarations

Ethical approval and consent to participate

Approval for this study was granted by the ethical committee of HAN University of Applied Sciences (ECO 197.09/20). All participants signed an informed consent.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

The research has been funded by ZonMW, The Netherlands Organisation for health Research and Development, and HAN university of Applied Sciences. The open access publication was funded by the Open Universiteit, Heerlen.

Authors’ contributions

MD and SD developed the interview guide and gathered the data. Analysis of the data was done by MD, SD and JE. Interview guide, method of analysis and deducted key themes were discussed and agreed upon by MD, SD, JE and AdL. All authors read and approved the final manuscript.

Acknowledgements

Janne Hermes, Marc de Man, Lonneke Enzerink, José van Lieshout, Evelien Sombekke, Hanneke Goosen

References


Tables

Table 1 The 14 domains of the TDF
<table>
<thead>
<tr>
<th>Capability (mental)</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Behavioral regulation</td>
</tr>
<tr>
<td></td>
<td>Memory, attention and decision processes</td>
</tr>
<tr>
<td>Capability (physical)</td>
<td>Skills</td>
</tr>
<tr>
<td>Motivation (reflective)</td>
<td>Goals</td>
</tr>
<tr>
<td></td>
<td>Intentions</td>
</tr>
<tr>
<td></td>
<td>Social/professional role and identity</td>
</tr>
<tr>
<td></td>
<td>Beliefs about consequences</td>
</tr>
<tr>
<td></td>
<td>Beliefs about capabilities</td>
</tr>
<tr>
<td></td>
<td>Optimism</td>
</tr>
<tr>
<td>Motivation (automotive)</td>
<td>Emotion</td>
</tr>
<tr>
<td></td>
<td>Reinforcement</td>
</tr>
<tr>
<td>Opportunity (physical)</td>
<td>Environmental context and resources</td>
</tr>
<tr>
<td>Opportunity (social)</td>
<td>Social influences</td>
</tr>
</tbody>
</table>

**Supplementary Files**

This is a list of supplementary files associated with this preprint. Click to download.

- Additionalfile1COREQChecklist.pdf
- Additionalfile2Interviewguide.docx
- Additionalfile3Respondentcharacteristics.docx
- Additionalfile4Codingguideline.docx
- Additionalfile5Relevantdomainsandaxialcodes.docx