Towards enhanced management of fear of falling in older people

Impact statement

This chapter focusses on the contribution of this thesis to society and science. The thesis consists of two parts and the achieved and potential future impact is described separately for each part below.

Part 1: Unravelling interventions

Society

Fear of falling (FoF) is very common among older adults (Scheffer et al., 2008). It may result in the avoidance of activities during which the risk of falling is perceived as high. If this is the case and the level of fear matches the abilities of an older person, FoF is realistic and protective (Delbaere et al., 2010). However, FoF can also be excessive and can lead to unnecessary avoidance of activities. Other consequences of FoF include physical deterioration, social isolation, and decreased quality of life (Cumming et al., 2000; Delbaere et al., 2004; Meulen et al., 2014). If older adults can no longer independently perform activities due to their FoF, their increased care needs can pressure healthcare systems. Furthermore, due to its association with an increased risk of falls and early nursing home admission (Cumming et al., 2000; Delbaere et al., 2004), FoF is indirectly associated with increased healthcare costs. Therefore, FoF is not only a relevant issue for older adults, but also for society as a whole. Consequently, management of FoF is imperative. When excessive FoF is reduced, older adults may be able to live at home independently for longer and their quality of life may be increased. To achieve this, effective interventions for FoF are required.

An up-to-date overview of interventions was presented in Chapter 2 and 3 of the thesis. The overviews contain information on the type of interventions available (including their characteristics and components), the effectiveness of those interventions (including the size of the effect) and the methodological quality of the studies that evaluated the interventions. The findings were published open access and they are freely available to policy makers and health professionals (Kruisbrink et al., 2021a; Kruisbrink et al., 2021e), whom may find the overview of the interventions helpful. For example, due to the commonness of FoF, policy makers may consider providing financial reimbursements via health insurance for those interventions that also reduce FoF. Alternatively, health professionals may want to address FoF in their clients and may be searching for an existing effective intervention. The thesis can support these

types of decisions, by providing information on what interventions are available, which interventions are effective and how large the expected intervention effects are. Additionally, the provided information on the risk of bias in the studies can help with the interpretation and weighing of the evidence. For example, an intervention that was evaluated in a rigorously conducted study with a low risk of bias may be preferred over an intervention that was evaluated in a study of poor methodological quality.

The thesis also contains details about the characteristics of interventions, such as the setting and delivery method. Furthermore, information about the presence of intervention components, such as strength exercise or education, was included. This overview of intervention characteristics and components is useful in determining if interventions would fit a certain context. For health professionals, this could be the context of an individual client, e.g. the client's preference for an individual intervention. For policy makers, this could be a municipality. For example, municipalities in the Netherlands have a responsibility to support individuals to live at home independently under the social support act (in Dutch: Wet maatschappelijke ondersteuning). If FoF is signaled as a relevant issue for a number of older adults in a municipality, policy makers may be searching for information about group interventions to efficiently target multiple individuals, in order to advise municipalities about what to offer under the social support act. The thesis contains details of several effective interventions that are delivered to groups of older adults in the community, such as a walking exercise program or Tai Chi (Hosseini et al., 2018; Yoo et al., 2010). Conversely, if exercise programs are already offered in the community, cognitive behavioral group interventions could be considered (Parry et al., 2016). The interventions presented in this thesis can be offered as they are. However, the results of this thesis can also be used as input to develop a new intervention or to improve existing interventions. One of the goals of this thesis was to explore which intervention characteristics and components are related to intervention effects. Although it is too early to formulate guidelines and recommendations for practice based on the current results, several characteristics and components were identified that seem to contribute towards intervention effects. These characteristics and

components can serve as inspiration for new interventions or can be incorporated into existing interventions.

Some of the results of the thesis are also directly applicable to current practice. Chapter 4 focused on two interventions that are offered by a number of healthcare organizations in the Netherlands today (Trimbos, n.d.). A Matter of Balance - Netherlands (AMB-NL) and A Matter of Balance - Home (AMB-Home) are the group and individual version of a cognitive behavioral intervention for people with concerns about falling (CaF) and activity avoidance. Both versions have officially been recognized as effective interventions by the Dutch National Institute for Public Health and the Environment and they are covered by several health insurance companies (Afdeling gezond leven, 2020; VeiligheidNL, 2021). By analyzing the data of the effectiveness trials of AMB-NL and AMB-Home, several participant characteristics were found to influence the effects of the interventions. For example, AMB-NL is more effective for people with depressive symptoms or lower levels of cognition. In addition, AMB-Home was more effective in those living together with someone else. These findings can be used to work towards more inclusive recruitment. Additionally, adaptations can be made to the interventions. For example, more intervention specific support can be offered to those participants of AMB-Home that live alone by reminding participants of their personal goals and planned activities in between sessions. These findings can contribute to continued improvement of AMB-NL and AMB-Home.

Science

Scientific impact was generated in four ways. First of all, the results were spread through the scientific community through several channels. At the time of publication of this thesis, two of the three articles of Part 1 were published in open access journals (Kruisbrink et al., 2021a; Kruisbrink et al., 2021e). This means the results are freely available for all, and can inform researchers. The findings were also presented at several scientific conferences. Furthermore, most of the data and all of the syntaxes underlying the findings were made openly available in an online database (Kruisbrink et al., 2021b; Kruisbrink et al., 2020; Kruisbrink et al., 2021f). Other researchers can use the data to validate findings or they can adapt and build upon the work of this thesis in future

studies. Second, although much of the work in this thesis was explorative and needs further confirmation and validation, a few characteristics and components seem to be associated with improved or decreased intervention effects on FoF. These findings can be used to generate hypotheses for future studies and for the development of conceptual models of interventions for FoF. Third, a start was made with a taxonomy, with which the content of interventions for FoF can be identified and categorized. The Prevention of Falls Network Europe (ProFaNE) already developed and published a fall prevention taxonomy. However, their taxonomy was not specifically developed for interventions with FoF as an outcome, and some components that are relevant were not included, such as meditation. Furthermore, because the ProFane taxonomy aimed to balance between a detailed and simple approach, it categorizes some interventions on the level of intervention types, such as cognitive behavioral interventions. This ignores that these interventions contain components such as cognitive restructuring and problem solving. The taxonomy presented in Chapter 3 was tailor made and presents the highest level of detail that could be achieved for interventions with FoF as an outcome. Fourth, the thesis illustrates an innovative approach to a complex issue, namely unravelling interventions and pinpointing what contributes to their effects. We were able to peek into the black box of interventions, by investigating interventions from multiple perspectives and on different levels of detail. On a meta-level, we examined what factors may be associated with intervention effects. Although meta-analysis has been around for some time, using meta-regression to investigate intervention characteristics and components is relatively new and it had never been attempted before for FoF. On a more detailed level, we examined how participants of interventions may influence effects. Considering that we used only published data and secondary data analysis, valuable information could be collected with relatively little effort and costs. It is likely that such an approach can be applied much more often, also in other areas, for interventions that reach small or moderate effects on other outcomes.

Part 2: Measuring activity avoidance due to fear of falling

Society

Many older adults avoid activities due to FoF (Halfens et al., 2016; Zijlstra et al., 2007). This avoidance behavior can be protective, but excessive avoidance of activities due to FoF may lead to an unnecessary decline in physical function, disability in the performance of activities and more falls (Delbaere et al., 2004; Deshpande et al., 2008). Therefore, it is important to screen for activity avoidance due to FoF in older adults that have a fall history or FoF. A few instruments that measure activity avoidance due to FoF are available (Lachman et al., 1998; Landers et al., 2011; Yardley & Smith, 2002), but their administration takes a substantial amount of time, causes additional burden, and is not yet routine practice. In this thesis, the Falls Efficacy Scale – International Avoidance Behavior (FES-IAB) was evaluated (Chapter 5). The FES-IAB is an instrument for activity avoidance due to CaF. It adds questions to an already commonly used measure for CaF; the Falls Efficacy Scale – International (FES-I) (Yardley et al., 2005). For each item of the FES-I, people are also asked to what extent they avoid activities due to their CaF. The FES-IAB was valid and reliable in a Dutch sample of community-dwelling older adults. Because it measures activity avoidance together with an existing measure for CaF, the FES-IAB is relatively quick and easy to administer. A valid and reliable shorter version, the Short FES-IAB, is also available when the setting requires it or time is limited. Clinical practice may benefit from using the FES-IAB to screen for activity restriction, set goals or track treatment progress. This is helpful to improve support of older adults with CaF.

Science

So far, there has been little attention for the behavioral consequences of falls and FoF in research. Avoiding activities is one important behavioral consequence. Available studies demonstrate that it is very common among older adults and that it is associated with negative outcomes. Activity avoidance due to FoF has implications for the independence of older adults and represents an important outcome to assess. Yet, few studies actually take it into account and there is not yet one widely used measurement instrument for this outcome.

The FES-IAB was first introduced by Dorresteijn and colleagues in 2011 (Dorresteijn et al., 2011) and the psychometric properties of the FES-IAB were still unknown. In 2013, the FES-IAB was administered online to a sample of older adults of the Longitudinal Internet studies for the Social Sciences (LISS) panel(CentERdata, 2014). In Chapter 5 of this thesis, the data of the LISS panel was used to evaluate the psychometric properties of the FES-IAB. Although the questionnaire demonstrated floor effects, the instrument was otherwise valid and reliable. These results are encouraging. After further validation and translation, the FES-IAB can be a valuable addition to the research field of fall prevention. Because it can be administered together with the FES-I, it may be more efficient and less burdensome for research participants than other measures of activity avoidance due to FoF. Hence, it has the potential to become a routine measure in clinical trials, which would facilitate research into the understudied behavioral consequences of FoF and would improve comparability of studies. In the future, the FES-IAB may be considered to be added to a common outcome set for studies in the field of falls and FoF. Assessing falls, FoF and activity avoidance as a set allows for better insight into the effects of interventions. For example, if all three of these outcomes are administered, it can be assessed whether interventions cause a realistic level of FoF, with levels of activity avoidance that match the capabilities of the older adult and without increasing adverse fall events.

The article describing the evaluation of the FES-IAB has been published open access and is freely available (Kruisbrink et al., 2021c). The data that underlies this part of the thesis is already available upon request from the LISS panel (CentERdata, 2014). The syntax and a Dutch and English version of the questionnaire will be made openly available online (Kruisbrink et al., 2021d).

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