

Development and evaluation of the feasibility of a guiding system for healthcare managers to enhance falls prevention policy in older clients

Guiding system for healthcare managers to enhance falls prevention policy

C.P.W. BASTIAANSEN, *RN*, corresponding author, *MSc student at the Clinical Health Sciences, Faculty of Nurse Science, Utrecht University, The Netherlands.*

Contact: C.P.W.Bastiaansen@students.uu.nl

Student number: 3664988

Co-authors:

Dr. J. NEYENS, *PhD, PT Faculty of Health, Medicine and Life Sciences, department of Health Services Research, Maastricht University*

Dr. J. MEIJERS, *PhD, RN Faculty of Health, Medicine and Life Sciences, department of Health Services Research, Maastricht University*

Dr. T. van der HOOFT, *MSc, Faculty, Clinical Health Sciences, Faculty of Medicine, Utrecht University, the Netherlands*

Utrecht University, Master Clinic Health Science (KGW), master program of Nursing Science, UMC Utrecht

Internship: CAPHRI (school for Public Health and Primary Care), Maastricht

Contact person CAPHRI: Dr. R.J.G. Halfens, PhD Associate professor in Nursing Science

Date: 07-05-2013, definitive version

Journal of publication: Journal of Advanced Nursing

Reference style: Harvard

Number of words Journal of Advanced Nursing: max 5000

Number of words: 3480 (max 3500)

Number of words Dutch summary: 288

Number of words English summary: 300

DUTCH SUMMARY

Titel: Ontwikkeling en evaluatie van de bruikbaarheid van een begeleidingssysteem voor beleidsmakers in de zorg om een valpreventief beleid voor oudere cliënten te versterken.

Achtergrond: Kwaliteitsmedewerkers uit de acute zorg, thuiszorg en wonen-zorg-welzijn ervaren moeilijkheden bij het interpreteren van valgerelateerde audit-resultaten van de Landelijke Prevalentiemeting Zorgproblemen (LPZ) en het vertalen van deze resultaten naar valpreventieve wetenschappelijk en praktijkgebaseerde acties in de dagelijkse zorg. De LPZ-onderzoeksgroep tackelt dit probleem.

Doel en onderzoeksvragen: Het doel van dit onderzoek is het exploreren van de bijdrage van een begeleidingssysteem aan kwaliteitsverbeteringen van valpreventief beleid in de dagelijkse zorg in Nederlandse gezondheidszorginstellingen die deelnemen in de LPZ-module 'Vallen'.

De onderzoeksvraag in de ontwikkelfase betreft: 'Welke elementen zijn nodig in een begeleidingssysteem (bestaande uit een beslisboom en actie tabellen) voor de deelnemers in de LPZ-module 'Vallen', om hun eigen resultaten te interpreteren en deze te vertalen naar relevante wetenschappelijke en praktijkgebaseerde acties in de dagelijkse zorg om de kwaliteit van valpreventieve zorg te behouden of te verbeteren.'

De onderzoeksvraag in de evaluatiefase betreft: 'Is het ontwikkelde begeleidingssysteem voor managers en kwaliteitsmedewerkers van de acute zorg, thuiszorg en wonen-zorg-welzijn bruikbaar om de kwaliteit van zorg te behouden of te verbeteren in hun instellingen?'

Ontwerp: Een dwarsdoorsnede onderzoek geïntegreerd in exploratieve sequentiële 'mixed method' onderzoek.

Methode: Het begeleidingssysteem is ontwikkeld met behulp van literatuur en is bediscussieerd met diverse deskundigen ($n=5$). Vervolgens is de bruikbaarheid getoetst door LPZ-coördinatoren (kwaliteitsmedewerkers) ($n=12$), door middel van een LPZ-gerelateerde vragenlijst. Na de interactieve data analyse, werden beide terugkoppelingen verwerkt in het begeleidingssysteem.

Resultaten: Deskundigen en LPZ-coördinatoren gaven aan dat het begeleidingssysteem, bestaande uit een beslisboom en gerelateerde actietabellen, in het algemeen compleet, gebruiksvriendelijk en duidelijk was.

Conclusie: Deze deskundigen en LPZ-coördinatoren ervaren het begeleidingssysteem als bruikbaar in de praktijk.

Aanbevelingen: Digitaliseren van het begeleidingssysteem is aanbevolen. Tevens is onderzoek naar de effectiviteit en de generaliseerbaarheid naar andere LPZ gerelateerde gezondheidsproblematiek aanbevolen.

Trefwoorden: Beslisboom, valpreventie, gezondheidszorg, kwaliteitsverbetering

ABSTRACT

Title: Development and evaluation of the feasibility of a guiding system for healthcare managers to enhance falls prevention policy in older clients.

Background: Quality employees of acute care, home care and long-term care experience difficulties with interpreting fall-related audit results from the (Inter)National Prevalence Measurement of Care Problems (LPZ) and bridged these results into falls preventive evidence and practice-based actions in daily practice. The LPZ-research group tackles this issue.

Aim and research questions: The purpose of this study is to explore whether a guiding system can contribute to the quality improvements of falls prevention policy in daily practice in the Dutch healthcare settings, participating the LPZ-module 'Falls'.

The research question in the development phase concerned: 'Which elements are needed in a guiding system (existing of a decision tree and action tables) for LPZ- module 'Falls' participants, to interpret their own results and to bridge relevant evidence and practice-based actions into daily practice to maintain or improve the quality of falls preventive care?'

The research question in the evaluation phase concerned: 'Is the developed guiding system feasible for managers and quality employees in acute care, home care and long-term care settings to improve the quality of falls preventive care in their settings?'

Design: A cross-sectional study, including a mixed-methods, exploratory sequential design.

Methods: The guiding system was developed by using literature and was discussed with experts in the field ($n=5$). Subsequently, the feasibility was assessed by LPZ-coordinators (quality employees) ($n=12$), using a LPZ-related questionnaire. After the interactive data analysis, suggestions from both groups were incorporated in the guiding system.

Results: Experts and LPZ-coordinators reported that the guiding system, comprising a decision tree with related action tables, was in general complete, useful and clear.

Conclusion: In general, experts and LPZ-coordinators perceived the guiding system as feasible to use in daily practice.

Recommendations: Digitalization of the guiding system is recommended. Also research into its effectiveness and generalization of other LPZ-related healthcare problems is recommended.

Keywords: decision tree, falls prevention, healthcare, quality improvement

BACKGROUND

Worldwide, 33 percent of community-dwelling people aged 65 years or older and 50 percent of the elderly above 80 years, fall at least once a year (CBO, 2004, Neyens, 2007, Halfens et al., 2012). In Dutch nursing homes, 50 percent of the clients fall at least once a year, and during hospital stays approximately 2-15 percent of clients fall (CBO, 2004). The falls incidence in the Netherlands is over one million per year (CBO, 2004). It is expected that in 2030, the falls incidence of people aged of 65 and older will increase to 3.8 million in the Netherlands (CBO, 2004). A fall can be defined as 'an unintentional change in body position, that results in a person coming to rest on the ground or other lower level' (Kellogg-Group, 1987). Falls incidents can cause serious problems, especially in older people (CBO, 2004). Therefore, it is pivotal to focus on falls prevention (CBO, 2004, Neyens, 2007).

The CBO guideline of falls prevention is the leading Dutch guideline which recommending evidence-based falls preventive care for clients. CBO supports healthcare employees in clinical decision-making (CBO, 2004). In the past two decades, fall-related decision-making in healthcare settings is increasingly based on evidence-based practice, due to the developments in falls preventive care (CBO, 2004, Grol and Wensing, 2006, Tinetti et al., 2006, Gillespie et al., 2008). However, implementation of this evidenced-based practice is complex and challenging (Grol and Wensing, 2006, Lemieux-Charles and Champagne, 2008, Rycroft-Malone et al., 2004). It is estimated that evidenced-based decisions in healthcare cover less than 40-50 per cent of all decisions, due to research utilization issues (Grol and Wensing, 2006). One of the key elements is to facilitate healthcare settings in audits and feedback to bridge evidence into practice (Grol and Wensing, 2006, Rycroft-Malone et al., 2004). Ivers et al. (2012) added that audits and feedback generally lead to important improvements in healthcare practice, but its effectiveness depends on how the feedback is provided. Systematic feedback ensures that healthcare employees can apply the audits and feedback (Grol and Wensing, 2006).

Having an policy based on an audit and feedback system regarding falls preventive care is essential to improve the quality of care (CBO, 2004). The (Inter)National Prevalence Measurement of Care Problems (LPZ) provides healthcare settings an insight via their quality

of care through annual LPZ-audits of pressure ulcers, intertrigo, restraints, malnutrition, incontinence and falls (Nie et al., 2013). Healthcare settings participating in the LPZ-audit receive their own data on care problems and aggregated data to benchmark themselves (Nie et al., 2013). However, managers and quality employees of these healthcare settings experienced difficulties with interpreting LPZ-audit results and bridged these findings to daily (nursing) practice (Nie et al., 2013). Nurses need to be informed and involved among these findings, since they have an important role of conducting falls prevention since they work 24/7 with clients. Due evidence- and practice based interventions, they are able to reduce the number of falls in elderly people (CBO, 2004).

Concerning malnutrition care, the LPZ has already developed a complete, useful and clear guiding system that supports healthcare settings to interpret their own audit results and bridge evidence and practice-based actions into daily practice, making it possible to maintain or improve the quality of malnutrition care (Meijers et al., 2013). This guiding system consists of a decision tree and related action tables (Meijers et al., 2013). Due to the positive results by Meijers et al. (2013), they recommend establishing similar guiding systems for related healthcare problems. One of these related healthcare problems is 'falls'. Therefore, a Guiding System to enhance Falls Prevention (GSF) based on the principles of Meijers et al. (2013) should be developed and evaluated.

THE STUDY

Problem statement

In general, managers and quality employees of Dutch healthcare settings experience difficulties with interpreting LPZ-audit results and bridged these findings into daily practice to maintain or improve the quality of care. To support these quality improvements of fall prevention policy, a guiding system that bridged LPZ-audit results in evidence and practice-based actions in daily practice is needed. However, such guiding system is lacking and it is unclear if it is feasible in daily practice.

Aim

The purpose of this study is to explore in what manner the GSF can contribute to the quality improvements of falls prevention policy in daily practice, in Dutch healthcare settings that participate in the LPZ-module 'Falls'. Eventually, nurses will be able to reduce the number of falls in elderly people, in order that serious problems of older clients can be prevented.

Before the GSF can be applied, it needs to be developed and feasibility tested in daily practice.

Research questions

The research question in the development phase concerned:

1. Which elements are needed in a guiding system (existing of a decision tree and action tables) for LPZ- module 'Falls' participants, to interpret their own results and to bridge relevant evidence and practice-based actions into daily practice to maintain or improve the quality of falls preventive care?

The research question in the evaluation phase concerned:

2. Is the developed GSF feasible for managers and quality employees in acute care, home care and long-term care settings to improve the quality of falls preventive care in their settings?

METHOD

Design

This study researched the GSF and its feasibility with a cross sectional design incorporating an exploratory sequential Mixed Methods design (Creswell and Plano Clark, 2011). There is currently no Dutch falls prevention policy system (CBO, 2004) and therefore the topic needed to be explored.

The study consisted of two phases: 1) development of a guiding system based on literature research and semi-structured interviews; 2) evaluation of the feasibility of the guiding system within the Dutch healthcare settings using a questionnaire. Both phases had equal weight in addressing the research problem. The study was an LPZ-related project, embedded in Maastricht University. A flowchart of the main procedures and timeline is shown in figure 1.

Insert figure 1 here

Development phase

Based on the construction of the guiding system of Meijers et al. (2013), information of the leading Dutch guideline regarding falls prevention (CBO, 2004), and information of the

expertise centre Vilans (2013) a concept of the GSF was developed. The GSF bridged LPZ-audit information to tailored evidence-based and practice-based falls preventive actions. The GSF was developed for easy use in the Netherlands and is therefore in Dutch.

Participants and selection

Experts, chosen by LPZ-research group, were selected to provide comments about the GSF in an interview. To gain more insight into the GSF concerning the categories: 'completeness', 'usefulness' and 'clarity', the experts were purposefully sampled based on their familiarity with the Dutch guideline (CBO, 2004), familiarity with Vilans (2013), and based on their various expertise (Holloway and Wheeler, 2010). The field of expertise varied between research, healthcare policies, and falls prevention in the acute care, home care and LTC. A sample size of five experts was sufficient to obtain various feedback and accomplish investigator triangulation (Holloway and Wheeler, 2010).

Data collection

The selected experts were invited by mail to participate in a semi-structured interview with researcher CB. After they agreed to participate, the concept GSF was sent one week before the meeting, to make preparation possible. The interviews lasted approximately one hour. After an introduction by the researcher, experts were asked semi-structured questions about: 1) what improvement suggestions they perceived regarding the elements of the decision tree and actions tables; 2) what their comments were regarding the elements of evidence- and practice-based actions of risk identification, interventions, quality indicators, awareness and implementation; 3) what they thought about the usefulness of GSF in daily practice; see Appendix I for 'the guideline interview'.

Subsequently after each interview, the expert's feedback was integrated in the GSF before the next interview (Creswell and Plano Clark, 2011). Interviews were audiotaped, allowing the researcher to hear back the suggestions (Creswell and Plano Clark, 2011).

Data analysis

Expert's feedback was analyzed using the procedure for qualitative data of Creswell and Plano Clark (2011). Using the audiotape, feedback regarding the elements of the GSF was transcribed into a document. Data was explored using memo's and thorough reading. Subsequently, the feedback was labeled into the categories 'completeness', 'usefulness' or 'clarity'. Similarities in the labels were combined and described. Then the researcher

checked if and how the research question was answered. Finally, the findings were verified by three members of the LPZ-research group for accuracy and validity.

The first phase led to the development of a guiding system that bridge LPZ-audit information into falls preventive evidence and practice-based actions.

Evaluation phase

Participants and selection

The feasibility of the GSF was evaluated using a questionnaire. The questionnaire was sent to all Dutch participating LPZ-coordinators (managers and quality employees) of the LPZ-module 'Falls' in 2012 (Halfens et al., 2012). In general, these sixteen purposive sampled participants were in charge of interpretation and dissemination of the LPZ-data into their Dutch healthcare setting.

Data collection

The questionnaire of Meijers et al. (2013) was the basis of the GSF questionnaire to assess the feasibility. In this study, feasibility was defined operationally as "the assessment of whether the GSF is useful and applicable in daily practice to managers and quality employees in healthcare settings". Adjustments in the GSF questionnaire, based on falls prevention care, were discussed with three members of the LPZ-research group (JN, JM, RH) and researcher CB for face and content validation. One of these members was the author of Meijers et al. (2013). The questionnaire contained nineteen likert-scales, dichotomous and open answer questions, divided into four sections; 1) two demographic questions; 2) seven questions about the decision tree (concerning completeness, usefulness and clarity); 3) six questions about action tables (concerning completeness, usefulness and clarity); 4) four questions about the implementation of the GSF.

The GSF and the questionnaire was sent to the sixteen LPZ-coordinators via e-mail, which included a link to the online questionnaire in a web-based program (SurveyMonkey, 2012). Answering the questionnaire took approximately 45 minutes. The questionnaire was anonymous, due to possible socially desirable responding. On the sixth day after dissemination a reminder e-mail was send. A reminder call was made on the thirteenth day. The deadline to respond was set at the fourteenth day.

Data analysis

Findings of the questionnaire were analyzed using the procedure for quantitative data of Creswell and Plano Clark (2011). Data was explored by descriptive analysis using the amount of responses to each question, to determine general trends in the data. Statistical tests were not needed, because of the exploring character of the study. Analysis program of SurveyMonkey (SurveyMonkey, 2012) was used to process the data.

Missing values occurred when the LPZ-coordinator dropped out before the questionnaire ends. To prevent that missing values distort the representativeness of the findings, these participants were not included in the analysis. Subsequently, the researcher checked if, and how, the research question was answered. The reliability and validity of the findings was discussed with members in the LPZ-research group.

The findings of the evaluation phase led to the definitive version of the GSF.

Ethical considerations

In both phases, only healthcare professionals were involved. Therefore, this research was not WMO-liable and approval of Medical Research Ethics Committee was not needed.

RESULTS

Development phase

The GSF was developed using the literature of Meijers et al. (2013), Dutch guideline for falls prevention (CBO, 2004), expertise centre Vilans (2013), and was associated with the LPZ-audit (Halfens et al., 2012). The GSF comprised a decision tree with related action tables, focused on the acute care, home care and LTC. The decision tree consisted of nine steps, concerning e.g. screening, (preventive) measures and implementation (Meijers et al., 2013). When a users answer negative to the question in the decision tree, they were referred to an action table, see figure 2.

Insert figure 2 here

The action tables were grouped in: 1) risk assessment (screening and monitoring falls); 2) organizational preventive measures; 3) practice based preventive measures; 4) improvement of quality indicators (e.g. guidelines, education); 5) improvement of awareness healthcare-employees; 6) improvement of implementation. In general, each action table was classified

into policy actions, knowledge and insight, measurement (improvement) and actions to establish routine. Table 1 shows a fragment of an action table.

Insert Table 1 here

Interviews with five experts resulted in three face-to-face meetings and two contacts by telephone because of time constraints. The professional functions were: 1) project leader of the expertise centre Vilans; 2) policy official in LTC; 3) quality manager in home care; 4) clinical geriatrician in acute care; 5) researcher in the field of psychosocial and physical functioning in old age.

Experts indicated three most important recommendations considering the GSF: 1) it was a complete system, however adding several elements such as restraints, medication, instinctive red flagging regarding high risk, and an information source (VeiligheidNL) would complete the GSF; 2) it was a useful system, yet recommended was to provide more tailored feedback, e.g. focused on each type of healthcare setting; 3) it was a clarifying system, although simpler use of language was recommended. In response to these recommendations, adjustments were made. For example, the GSF now contains hyperlinks regarding information sources, and tailored advice was colored for each type of healthcare setting.

Evaluation phase

Eight participants (response =50%) completed the questionnaire. Participants with missing values ($n=4$) were not included in analysis. Time constraints was indicated as the main reason to not complete the questionnaire. Table 2 indicates the function and setting of all participants.

Insert Table 2 here

Results were described in the three categories, subdivided by the feedback of the decision tree and actions tables.

Completeness of the GSF

- All eight participants indicated that they did not miss any steps or information in the decision tree, but recommended was to reduce the amount of steps and tailor them, to benefit the readability.

- Participants also indicated that they did not miss any topics, themes or information sources in the action tables. They advised to reduce and tailor the amount of actions. Participants did not elaborate which information or steps they meant. Suggestions to digitize the GSF were made, for a user-friendly tailored overview.

Usefulness of the GSF

All eight participants valued the usefulness of the GSF, using the grading scale, as moderate ($n=1$) and good ($n=7$). Because of GSF's systematic method, the interaction with the LPZ-audit and evidence-based practice provided awareness of the opportunity to improve the quality of care.

- The steps in the decision tree (e.g. risk identification and preventive measures) were mainly ($n=6$) appreciated as useful in relation with the LPZ-audit. The quality of the information in the decision tree was appreciated, using the grading scale, as moderate ($n=1$), good ($n=6$) and very good ($n=1$). Furthermore, all participants indicated that the steps of the decision tree linked well with the action tables.
- The action tables were appreciated as useful for daily practice. However, two participants stated that the action tables were not easy to manage due to the large quantity of text. Opinions were divided; sufficient information was needed to convert actions into falls prevention policy, yet too much information made the action tables less workable. Tailoring or digitalizing the GSF was recommended. Quality of information in action tables was appreciated, using the grading scale, as moderate ($n=1$) and good ($n=7$).

Clarity of the GSF

- Participants gave various feedback regarding the clarity of the steps classification of the decision tree. For example, six participants indicated it was clear and logic: "*it is a workable choice*". Although, two participants preferred the following sequence of steps: first 'improvement of quality indicators' due its framework potential of the remaining steps, followed with 'preventive measures' and 'review incidence rate'.
- Six participants indicated that the classifications of the action tables were clear, and the steps were logic and workable. One participant found that the sequence of classifications should start with 'improvement of awareness', then 'screening', and finally 'improvement of (preventive) measures'. Furthermore, two recommendations were to pay attention to typing errors, and to provide practical examples of falls prevention

policy. In respond, a summarized information card of a falls preventive guideline was added, which was created by a particular healthcare setting.

DISCUSSION

To our knowledge, this is one of the first studies that developed and evaluated a guiding system to enhance falls prevention policy for Dutch healthcare settings. In general, the participants in this study indicated the GSF as feasible to use in daily practice. Participants were predominantly positive regarding the completeness, usefulness and clarity of the GSF.

This study indicated that the GSF is important for managers and quality employees to maintain or improve falls prevention in their healthcare settings. This statement is in line with Grol and Wensing (2006) and Lemieux-Charles and Champagne (2008), which stated that such systems, e.g. decision tree, are important to implement the evidence-based actions into practice. The feedback in the GSF provides managers and quality employees evident starting points to implement their findings. Ivers et al. (2012) endorsed that the effectiveness of its implementation depends on how the feedback is provided. Through the dual construction of the GSF, the decision tree and related action tables, is the GSF consistent with this pronouncement of Ivers et al. (2012).

Respected clinical reviewers, such as Gillespie et al. (2008), Baker et al. (2010) and Cameron et al. (2012) indicated that it is not clear if falls prevention programs are effective in reducing falls rates. They stated that less is known about which interventions prevent falls, because its effectiveness is measured differently in many research studies. Nevertheless, the reviewers are convinced that falls prevention interventions result in a lower falls incidence rate (Gillespie et al., 2008, Baker et al., 2010, Cameron et al., 2012). However, this effectiveness should not be confused with the present falls prevention policy. The GSF covers a broader context, consisting of, for example, screening, (preventive) measures, implementation activities and policy activities. Therefore managers and quality employees have additional actions to increase the falls preventive care in the healthcare settings. Although these actions are applicable in all Dutch acute care, home care and LTC settings, the GSF will be exclusive for the LPZ-participants. Due to this, the LPZ encourage healthcare settings to join their annual LPZ-audit.

Study strengths and limitations

The strength of our study is, that not only a guiding system was developed, but it also checked the feasibility of this system. With this double focus, we did not only provide a falls preventive guiding system, but we bridged it to practice as well.

These findings need to be considered in view of several limitations. Only eight LPZ-coordinators completely filled out the questionnaire, and their responses to open questions were minimal. A possible cause is time constraints; the questionnaire was available in a very busy period and reading the GSF was reported as being stressful. Moreover, none of the LPZ-coordinators of the home care, and only one LPZ-coordinator of the acute care participated in the questionnaire, which limits the generalization for those settings. However, the experts in the field of acute care and home care participated actively, making the findings broadly applicable.

CONCLUSION

In general, this mixed methods study shows that most experts and LPZ-coordinators appreciated the developed and evaluated guiding system to enhance falls prevention policy as feasible in daily practice. This study has increased our knowledge and provides a guiding system regarding the needs and practices of experts and LPZ-coordinators in providing falls preventive policy for older clients in the acute care, home care and LTC.

RECOMMENDATIONS

Participants recommended that to enhance the feasibility of the GSF, it needs to be digitalized. That way, managers and quality employees, who will use the GSF, have a compact overview of actions tailored to their situation and setting. This makes it more accessible for them to integrate evidence and practice-based actions into daily (nursing) practices.

As result, managers and quality employees can direct nurses to apply these actions in daily practice to reduce falls incidents in older clients.

To provide recommendations about the GSF, experts had one week for preparation and LPZ-coordinators had two weeks. This period was too short for the participants to test the GSF in practice. In future research, a longitudinal study is therefore recommended to assess the effectiveness of the GSF and to measure effects in falls incidence. Furthermore, due to the positive results of the guiding system, it is recommended that this system be generalized

to the remaining healthcare problems measured by the LPZ; pressure ulcers, intertrigo, restraints and incontinence.

Acknowledgements: We thank all experts and LPZ-coordinators who participated in this study.

Funding: This study received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of interest: No conflict of interest has been declared by the authors.

Author contributions: All authors have agreed on the final version and meet at least one of the following criteria: Substantial contributions to conception and design, data collection, data analysis and/ or writing the manuscript; provision of significant advice or consultation.

REFERENCES

- BAKER, R., CAMOSSO-STEFINOVIC, J., GILLIES, C., SHAW, E. J., CHEATER, F., FLOTTORPS, S. & ROBERTSON, N. (2010) Tailored interventions to overcome identified barriers to change: effects on professional practice and health care outcomes (review). *Cochrane Database of Systematic Reviews*
- CAMERON, I. D., GILLESPIE, L. D., ROBERTSON, M. C., MURRAY, G. R., HILL, K. D., CUMMING, R. G. & KERSE, N. (2012) Interventions for preventing falls in older people in care facilities and hospitals (review). *Cochrane database of systematic reviews*, Art. No.: CD005465. DOI: 10.1002/14651858.CD005465.pub3.
- CBO (2004) Richtlijn: preventie van valincidenten bij ouderen. Utrecht, Van Zuiden Communications B.V. ISBN: 90-8523-026-8. Available at: <http://www.cbo.nl/Downloads/389/val-richtlijn2004.pdf> (Accessed 17 January 2013).
- CRESWELL, J. W. & PLANO CLARK, V. L. (2011) *Designing and conducting Mixed Methods Research*, United Kingdom, SAGE Publications, Inc.
- GILLESPIE, L. D., GILLESPIE, W. J., ROBERTSON, M. C., LAMB, S. E., CUMMING, R. G. & ROWE, B. H. (2008) Interventions for preventing falls in elderly people (Review). *The Cochrane Library*, 1.
- GROL, R. & WENSING, M. (2006) *Implementatie: effectieve verbetering in de patiëntenzorg*, Maarssen, ELSEVIER Gezondheidszorg.
- HALFENS, R. J. G., MEIJERS, J. M. M., MEESTERBERENDS, E., NIE, V. N. C., NEYENS, J. C. L., RONDAS, A. L. M. & SCHOLS, J. M. G. A. (2012) *Landelijke Prevalentiemeting Zorgproblemen Rapportage resultaten 2012*, Maastricht, CAPHRI school for Public Health and Primary Care.
- HOLLOWAY, I. & WHEELER, S. (2010) *Qualitative Research in Nursing and Healthcare*, United Kingdom, WILEY-BLACKWELL.
- IVERS, N., JAMTVEDT, G., FLOTTORP, S., J.M., Y., ODGAARD-JENSEN, J., FRENCH, S. D., O'BRIEN, M. A., JOHANSEN, M., GRIMSHAW, J. & OXMAN, A. D. (2012) Audit and feedback: effects on professional practice and healthcare outcomes (Review). *Cochrane database of systematic reviews*.
- KELLOGG-GROUP (1987) The prevention of falls in later life. *Dan Med Bull*, 34, 1-24.
- LEMIEUX-CHARLES, L. & CHAMPAGNE, F. (2008) *Using knowledge and evidence in health care: Multidisciplinary perspectives*, Canada, Library and Archives Canada Cataloguing.

- MEIJERS, J. M. M., HALFENS, R. J. G., MIJNARENDS, D. M., MOSTERT, H., JOS, M. G. A. & SCHOLS, M. D. (2013) A feedback system to improve the quality of nutritional care. *Nutrition*, 29, 1037-1041.
- NEYENS, J. C. L. (2007) *Fall prevention in psychogeriatric nursing home residents*, PhD dissertation. Maastricht: Universiteit Maastricht, ISBN: 978-90-8590-021-4.
- NIE, V. N. C., SCHOLS, M. G. A., LOHRMANN, C., BARTHOLOMEYCZIK, S., SPREEUWENBERG, M. & HALFENS, R. J. G. (2013) An International Prevalence Measurement of Care Problems: Study design. *Journal of Advanced Nursing*, in press.
- RYCROFT-MALONE, J., HARVEY, G., SEERS, K., KITSON, A., MCCORMACK, B. & TITCHEN, A. (2004) An exploration of the factors that influence the implementation of evidence into practice. *Journal of Clinical Nursing*, 13, 913-924.
- SURVEYMONKEY (2012). Available at: <http://nl.surveymonkey.com/> (Accessed 20 March 2013).
- TINETTI, M. E., GORDON, C., SOGOLOW, E., LAPIN, P. & BRADLEY, E. H. (2006) Fall-risk evaluation and management: a case study of the challenges in adopting geriatric care practices *Gerontologist*, 46, 717-725
- VEILIGHEIDNL Consument en Veiligheid, valpreventie 65-plussers. Amsterdam. Available at: <http://www.veiligheid.nl> (Accessed 16 January 2013).
- VILANS (2013) Vilans: Knowledge of long-term care. Available at: <http://www.vilans.nl/> Informatiecentrum (Accessed 13 January 2013).

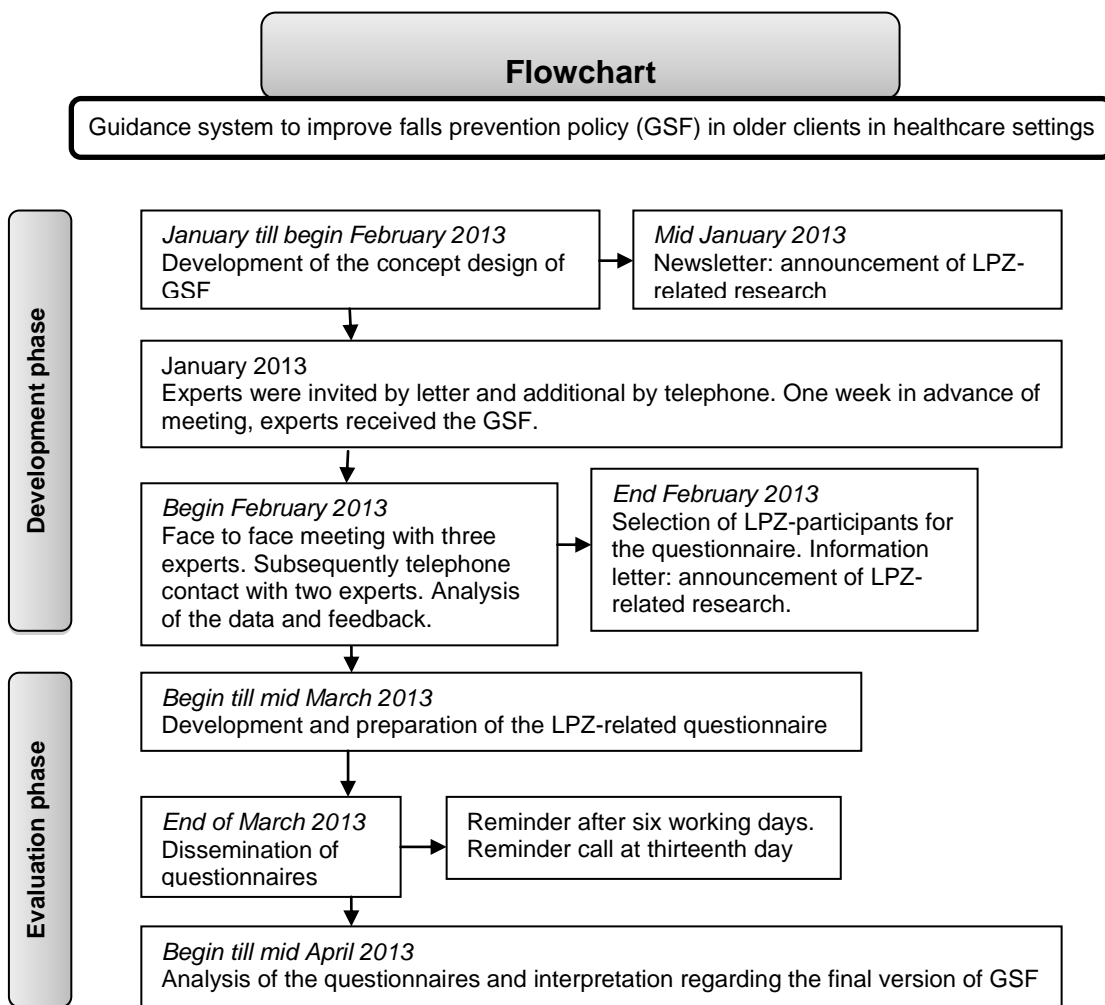
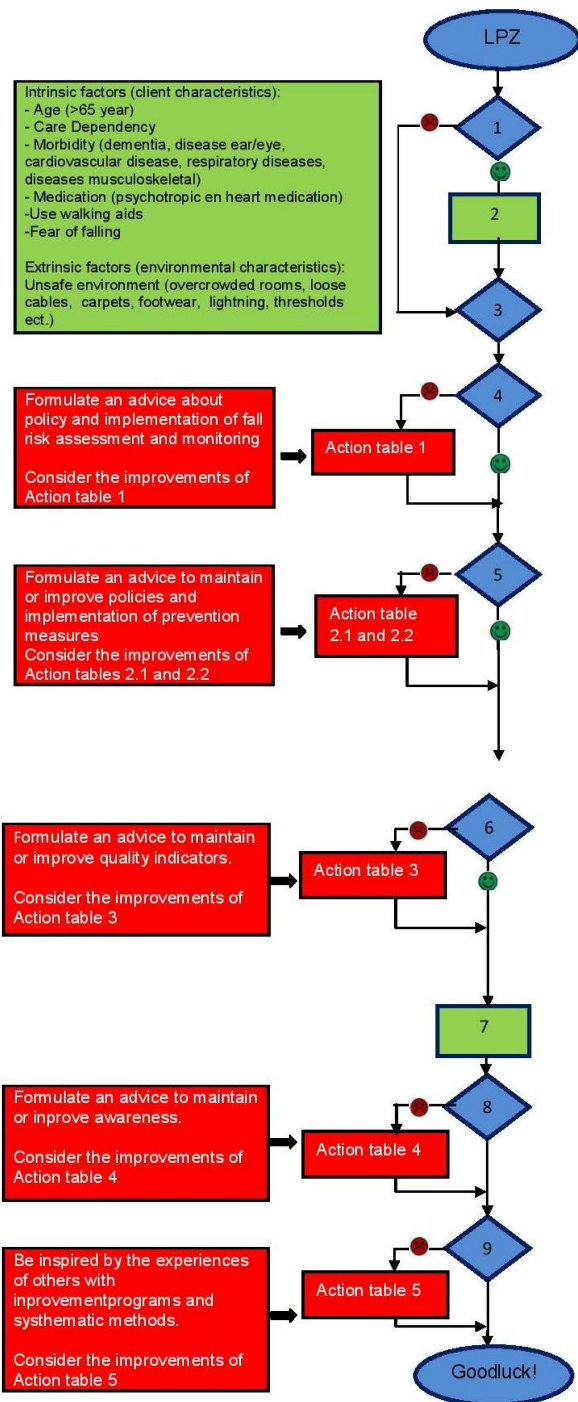


Figure 1. Flowchart of study design and the main study procedures

● → yes or ok ● → no or not ok



1= Is the incidence of falls lower* than the national mean? Is the incidence of falls lower than last year? Is the incidence of falls lower than the mean incidence of other locations in your organization?

2= Celebrate the low(er) incidence rate! Find out how you can maintain or improve your score even more.

3= Be critical towards the incidence rate. Be alert to client and environmental characteristics that can influence the incidence rate (see the green box).

4= Are risk assessments performed of falls in clients? Does screening of fall risk at admission take place? Is fall risk monitored regularly during admission?

5= Do clients with (high risk of) fall incidents receive measures? (Including primary, secondary and tertiary prevention). (compare the results with the national mean, the results of last year and/ or results of other locations in your organization)

a: Are fall preventive measures provided to all clients with risk on fall incidents? Is the effectiveness of the applied measures evaluated?
b: Does your institution have a policy addressing falls prevention? Are treatment activities written down in a patient record file? Are there several aspects included in the intervention program? Is the fall prevention multidisciplinary discussed?
In case of at least one negative answer to a or b, go to action table 2

6= How do you score on quality indicators?

a: Quality indicators at institutional level: (up-date) falls preventions protocol, fall preventive team, decentralized registration of fall incidents, fall prevention training every two year, transfers/movement training every two year, information brochure regarding falls prevention, standard handover at admission and discharge.
b: Quality indicators at department level: specialized nurse at fall prevention, fall risk assessment at admission, multidisciplinary consultation, functioning according protocol, register fall preventive measurements in a patient record file, available falls/ injury preventive tools, information brochure for clients and employees, standard handover at admission and discharge.
In case of at least one negative answer to a or b, go to action table 3

7= You should be proud of the achievements you make, celebrate every success with your co-workers.

8= Do you think there is enough attention for awareness of good falls prevention in your institute? Does the subject 'falls prevention' matters among employees? Are the employees aware of the tension between falls prevention and restrains?

9= Do you have sufficient knowledge/experience for the successful creation, implementation and confirmation of an action plan aiming to reduce falls incidence in your organization?

* If the size of the studied group is small, incidents rates have to be interpreted with caution. The falls incidence, calculated over 30 days, may seem relatively high, while only few clients have a risk of fall incidents. The number of clients and the number of fall per client should also be in considering.

Figure 2. Decision tree

Table 1. Fragment of an action table

Area of improvement	Question	Final users	Target group	Recommendation	Source
Policy actions	How develop policies, concerning multidisciplinary collaboration?	Team leader, pharmacist, paramedics healthcare team	Manager, Quality officer	Expand permanent partnerships, e.g. in form of periodic multidisciplinary consultation. The practical guide is the module 'multidisciplinary cooperation in prevention'	www.zorgvorbeter.nl
Actions to establish routine	How establish a quality workgroup?	Team leader, Healthcare team	Manager, Quality officer	The PDSA-cycle (Plan-Do-Act-Check) is leading in assurance of quality improvement	www.zorgvorbeter.nl

Table 2. Participants questionnaire

	Completed	N	Missing values	N	Total N
Acute care	nurse, paramedic or physician	1	nurse, paramedic or physician	2	3
Home care	-	0	-	0	0
LTC	care- or quality managers	4	care- or quality managers	0	4
	staff officer	2	staff officer	1	3
	nurse, paramedic or physician	1	nurse, paramedic or physician	1	2
Total N		8		4	12

APPENDIX

Appendix I: Guideline interview

The content of the conversation is derived of the decision tree with action tables of a prior LPZ-research (Meijers et al., 2013).

Structure:

1. Introduction
2. Explain the context of the decision tree
3. Explain aim of this study:
 - To develop an extended falls prevention policy decision tree, based on the falls prevention guideline of CBO (CBO, 2004).
4. Inform the framework of the meeting:
 - Explain that their point of view is very important
 - Inform that their recommendations will be compared with the recommendations of other experts
 - Inform that the meeting will take about one hour
 - Inform that the anonymity is guaranteed by means of coding
 - Ask permission to audio recording
 - Inform the sequence of the meeting
5. Start audio recording
6. Questions:
 - What improvement suggestions experts perceived regarding the decision tree and the actions tables?
 - What are the experts comments regarding the evidenced- and practice-based actions of risk identification, interventions, quality indicators, awareness and implementation?
 - What the experts believe if the GSF will be useful in daily practice?
7. Stop audio recording
8. Afterwards
 - Give incentive