PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Healthcare provision, functional ability and quality of life after proximal femoral fracture - 'ProFem': Study protocol of a population-based, prospective study based on individually linked survey and statutory health insurance data
AUTHORS	Andrich, Silke; Ritschel, Michaela; Meyer, Gabriele; Hoffmann, Falk; Stephan, Astrid; Baltes, Marion; Blessin, Juliane; Jobski, Kathrin; Fassmer, Alexander; Haastert, Burkhard; Gontscharuk, Veronika; Arend, Werner; Theunissen, Lena; Colley, Denise; Hinze, Raoul; Thelen, Simon; Fuhrmann, Petra; Sorg, Christian; Windolf, Joachim; Rupprecht, Christoph J.; Icks, Andrea

VERSION 1 - REVIEW

REVIEWER	Tsan-Wen Huang Department of Orthopaedic Surgery, Chang Gung Memorial Hospital, Chiayi, Taiwan
REVIEW RETURNED	19-Dec-2018

GENERAL COMMENTS	The high morbidity and mortality rates following proximal femoral fractures can be devastating for the patient and increase the burden on health care systems. Poor outcomes following proximal femoral fractures had been report and a healthcare gap existed in the elderly population. This study protocol may contribute to improving older people's health-related quality of life, functional ability, and social participation as well as to the reduction of costs associated with the avoidable need of care, and hospitalisation after proximal femoral fracture. However, patients who were not ambulatory preoperatively, and patients who had delirium or dementia and could not cooperate to assess the functional outcomes and patient-reported outcomes should be excluded.

REVIEWER	Ian Cameron University of Sydney, Australia
REVIEW RETURNED	02-Feb-2019

GENERAL COMMENTS	This is an important study that will give very useful information about people with proximal femoral fractures (PFF), particularly people who are usually excluded from studies of this condition.

	It is important that that proxies can contribute data because people with dementia commonly have PFF. However, it is known that proxy data is different from self reported data. How is that to be dealt with? Furthermore over the course of the study, for the more vulnerable and disabled participants, there will be a mixture of self reported and proxy data for a number of participants. How will the systematic differences in responses be addressed in the analyses? The outcomes to be recorded are comprehensive. It is likely that a number of participants will not be able to complete all items at one session. How will that be managed? Also a number of participants will have intercurrent illness that prevents them being interviewed at the planned time. The investigators may have established procedures to address this (for example trying three times and then reporting data as missing if it is not recorded) and these should be mentioned briefly. Specific comments: Page 7, line 41: it is not clear what a “case finding”. Page 8, line 27: it is not clear whether people with proximal femoral fracture and no surgery will be included. This will be a small group but will be highly atypical of all people with proximal femoral fracture. This also applies to Appendix B. Page 9, line 40: “care dependency” should be explained further. It is not clear whether this is a classification used in the German health and care system or whether it is a rating from some other source. Subsequently it is noted that this is explained on page 11, line 40. These two sections should be cross referenced. There are several other issues on which the investigators might comment. The reviewer is not requesting changes to the text of the paper to address these. There is a large amount of data collection from older people with PFF who will be in the recovery period after their PFF. How will the researchers ensure that they are not burdened by the data collection? This study could, in addition, provide cohort data about changes in functioning and resource use as a result of PFF. For example, is it possible to analyse the changes in care dependency and other factors as a result of the PFF?

VERSION 1 – AUTHOR RESPONSE

Referee: 1

Comments to the Authors

Paragraph 1

The high morbidity and mortality rates following proximal femoral fractures can be devastating for the patient and increase the burden on health care systems. Poor outcomes following proximal femoral

fractures had been report and a healthcare gap existed in the elderly population. This study protocol may contribute to improving older people's health-related quality of life, functional ability, and social participation as well as to the reduction of costs associated with the avoidable need of care, and hospitalisation after proximal femoral fracture. However, patients who were not ambulatory preoperatively, and patients who had delirium or dementia and could not cooperate to assess the functional outcomes and patient-reported outcomes should be excluded.

Thank you for your appreciation of our study. We are conducting this population-based prospective study in the field of Health Services Research in order to gain knowledge about the situation after a proximal femoral fracture for different groups of people. Since this is not an intervention study, but an observational study, it is possible and very important to consider different groups of people in the study, with the knowledge of the associated advantages, disadvantages and problems. Therefore, one of the strength of our study is the inclusion of vulnerable subgroups such as physical impaired people or people with dementia, who are at high risk for hip fractures. There are only a few studies addressing this issue and we would like to take opportunity to obtain data/information of this vulnerable subgroup. We understand your concern, that people who were not active before the event and people with delirium or dementia could not cooperate to assess the functional outcomes and patient-reported outcomes. However, we have established procedures and will use instruments and secondary data that will allow us to overcome this concern: First, for this subgroup we will use a shorter questionnaire and conduct proxy interviews in case of a limited interview ability. Second, we will use the Statutory Health Insurance (SHI) data to characterise the different subgroups regarding e.g. dementia or delirium. Third, we use the Mobility Parker Score and the existence of remedies and medical aids to gain for example knowledge about the pre-fracture walking ability. With this information we will be able to adjust our analysis regarding those vulnerable subgroups. Please see our answers to the comments of reviewer 2, who is also interested in how to deal with this vulnerable population and their data.

Referee: 2

Comments to the Authors

Paragraph 1

It is important that proxies can contribute data because people with dementia commonly have PFF. However, it is known that proxy data is different from self reported data. How is that to be dealt with? Furthermore over the course of the study, for the more vulnerable and disabled participants, there will be a mixture of self reported and proxy data for a number of participants. How will the systematic differences in responses be addressed in the analyses?

We agree with the reviewer that self-reported data may differ considerably from proxy-reported data. However, it seems that variations between self-reported and proxy-reported values depend on the type of data: Facts like demographic information will in most cases be reported congruently while for example subjective information on quality of life may be reported differently. It is known that pain cannot be reliably assessed by proxy-report. There exist no commonly used statistical method to handle such a problem so that data driven solutions seem to be suitable. This is why, we will firstly perform a separate analysis for four strata: only self-reported values of people without dementia, only self-reported values of people with dementia, only proxy related values and paired self-proxy values. Outcomes will be described stratified by these strata at T0, T1 and T2. In the subpopulation of people with dementia and paired self-reported and proxy values the correlation between both values will be described and estimated in explorative analyses using graphical and/or regression methods. Discussing the results from the data and from literature it will be decided, whether and how proxy values can be used to impute missing self-reported values for people with dementia. These analyses

will be explorative and cannot be fixed in advance in all details, because reasonable methods will heavily depend on frequencies of proxy values and on their associations with self-reported values. No standard methods are available. Furthermore, people changing between self-reported and proxy values during follow up will be described separately, and specific imputation methods for missing self-reported values in the time course will be discussed. We added a more detailed description of planned analyses on different subpopulations of patients with self-reported and/or proxy values including possible imputation of missing self-reported values by (transformed) proxy values on page 17:

Graphical or regression methods will be used to describe and exploratively estimate the association between paired self-reported and proxy values in the subpopulation of participants with dementia/reduced state of health at fixed time points. It will be discussed, whether imputation of transformed proxy values in missing outcome values should be done. Further subpopulations will be considered for sensitivity analyses: participants without dementia / reduced state of health, participants with dementia / reduced state of health only with self-reported values resp. only with proxy values. Furthermore, participants changing between self-reported and proxy values during follow up will be described separately. Depending on frequencies and results, specific imputation methods for self-reported values will be discussed.

Paragraph 2

The outcomes to be recorded are comprehensive. It is likely that a number of participants will not be able to complete all items at one session. How will that be managed? Also a number of participants will have intercurrent illness that prevents them being interviewed at the planned time. The investigators may have established procedures to address this (for example trying three times and then reporting data as missing if it is not recorded) and these should be mentioned briefly.

For addressing people who seem to be not able to complete all items at one session, we will use a shorter questionnaire and/or conduct proxy interviews in case of a limited interview ability. A second visit might be considered if it is necessary to stop the interview. If a person is too ill to be interviewed at baseline but willing to stay in the study, we will try to arrange an interview at the next time interval (please see additional sentence on page 6) and later on see if and how data can be used (e.g. through imputation method). If the participant is not able to take part at the interview on the postponed date we will only conduct the interview with a proxy. Since we already started our study we can draw on experience regarding the impact of intercurrent illness or other situations that make an interview at the planned time impossible. If an interview with a participant was planned, it could always be carried out by the second date at the latest.

Paragraph 3

Page 7, line 41: it is not clear what a “case finding”.

Thank you for this important note. We want to detect people (cases) who have poor outcomes and may need more healthcare compared to other people. We will develop an algorithm to identify these people or cases. We have described this procedure with the term “case finding”. We added an explanation: This will be done by developing an algorithm which generates a 'case finding' to detect those groups of people.

Paragraph 4

Page 8, line 27: it is not clear whether people with proximal femoral fracture and no surgery will be included. This will be a small group but will be highly atypical of all people with proximal femoral fracture. This also applies to Appendix B.

People with conservatively treated proximal femoral fracture are for sure highly atypical. However, we will focus on people with PFF, which are surgically treated. For this reason we will use ICD-10 codes in combination with OPS-Codes as described on page 6. To make this clearer, we added “surgically treated” in the list of inclusion criteria in Appendix B (“Surgically treated PFF identified using ICD-10 codes S72.0, S72.1 and S72.2, and OPS-Codes (for OPS-Codes see Appendix A)”).

Paragraph 5

Page 9, line 40: “care dependency” should be explained further. It is not clear whether this is a classification used in the German health and care system or whether it is a rating from some other source. Subsequently it is noted that this is explained on page 11, line 40. These two sections should be cross referenced.

Thank you for the helpful comment. Care dependency is defined by a classification system for a person’s impairment of autonomy used in the German healthcare system. We added a more detailed definition for care dependency: “Care dependency (including new occurrences) is defined by a classification system for a person’s impairment of autonomy and displayed in five care degrees according to the German Nursing Care Act (1 to 5). The five care degrees are depending on the amount of care needed and with a range from the level of care 1 (minor impairment of the person's autonomy) up to level 5 (heaviest impairment with special demands on nursing care).” Classification is carried out by experts from the statutory health insurance systems.

Unfortunately, it is not possible to cross reference the section on page 11 line 40 – the topic described there is about fear of falling. Please let us know if there is any need to make further changes.

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There are several other issues on which the investigators might comment. The reviewer is not requesting changes to the text of the paper to address these.

Paragraph 6

There is a large amount of data collection from older people with PFF who will be in the recovery period after their PFF. How will the researchers ensure that they are not burdened by the data collection?

To make sure the participants will not be burdened by the data collection, several measures were deployed.

The potential participants receive a written invitation to take part in the survey, which includes information about the type of data collected, the process of data collection (personal interview and postal survey) and about the approximate duration. Due to the target population, a proxy is explicitly addressed as well, such as children, children in law, partners or a comparable trusted person.

Furthermore, the appointment for the interview is arranged in a personal telephone call, where additional information is given and questions are answered. On the basis of this information and

appropriate time frame the potential participants are able to decide, whether they want to take part in the survey or not.

As stated above, there is the possibility to decide whether a short version of the questionnaire is used, in case the original version seems to be too long for the participant. For example in case of poor general health condition or cognitive impairment. In these cases, only questions regarding subjective feelings such as e.g. quality of life are asked, and a proxy is invited to answer the whole questionnaire (or the complete questionnaire if necessary) on behalf of the potential participant.

Before starting the interview, the interviewer informs the participant that it is possible to take brakes during the interview or end the interview at any time, if the participant feels like it. In addition, the interviewer can decide to make brakes or end the interview if he or she notices that the participant could be or is burdened by the situation. Show cards displaying the possible answers of the standardised questionnaire in big letters are used to support people with hearing impairment or cognitive impairment in answering the questions.

All people working in the study who are in contact with the participants (by telephone or during the personal interviews) receive a comprehensive training. The training focuses – among technical aspects- on the needs of the population, especially the needs of older people with poor general health condition or cognitive impairment. Moreover, interviewers are either experienced study nurses or research assistants with a healthcare professional's background (nursing, physiotherapy). Beyond, a manual and standard operating procedures (SOPs) are developed in order to support and standardise data collection. In addition, the data collection was piloted to check the comprehensibility and durability of the questionnaire as approximation of the burden of the survey.

Paragraph 7

This study could, in addition, provide cohort data about changes in functioning and resource use as a result of PFF. For example, is it possible to analyse the changes in care dependency and other factors as a result of the PFF?

This is a very important point for estimating the burden of PFF. We confirm, that we will analyse changes in care dependency. Moreover we will examine newly admissions to nursing homes after PFF or re-hospitalisation. In addition, we will investigate the occurrence of short-term and long-term care.

VERSION 2 – REVIEW

REVIEWER	Tsan-Wen Huang Chang Gung Memorial Hospital, Chiayi, Taiwan
REVIEW RETURNED	03-Apr-2019

GENERAL COMMENTS	The reviewer completed the checklist but made no further comments.

REVIEWER	Ian Cameron University of Sydney, Australia
REVIEW RETURNED	24-Mar-2019

GENERAL COMMENTS	The authors have addressed the issues raised by the reviewer.