Integrated service delivery to ensure persons’ functional autonomy

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Introduction

Most people 65 and over enjoy good health and live autonomously at home. However, some elderly people, living at home or in a seniors’ residence, experience moderate to severe loss of autonomy. During the project for implementing an Integrated Services Delivery (ISD) for the elderly in the Eastern Townships, the partners needed to find a rapid and effective way of identifying elderly people with moderate to severe loss of autonomy, in the absence of a recognized SMAF score (Système de mesure de l’autonomie fonctionnelle – Functional Autonomy Measurement System). Johanne Bolduc, of the Carrefour Santé of the regional municipality (MRC) of Coaticook, had requested a tool of this kind. The PRISMA (Program of Research to Integrate the Services for the Maintenance of Autonomy) research team had previously conducted a mail survey to identify elderly people at risk of losing their autonomy (prediction). A re-analysis of this data made it possible to select the questions that were the best descriptors of actual loss of autonomy.

This document is aimed at presenting the PRISMA-7 tool to decision-makers and clinical practitioners whose patients are solely or primarily elderly people.
Target population and autonomy continuum

Autonomy continuum

Autonomous, good health (or slight loss of autonomy) → Living at home
Autonomous, moderate to severe loss of autonomy → Living at home, in a seniors’ residence or with a foster family
Severe loss of autonomy → Some receive and are known to health services
Moderate to severe loss of autonomy → Some have little or no contact with health network but would benefit from an evaluation

The need

To identify people with moderate to severe loss of autonomy whose condition is not known to us, a condition that could deteriorate rapidly if no action is taken. They should at the very least undergo an autonomy evaluation.

The objective

In the absence of a known SMAF score, use a simple, effective and rapid tool to identify elderly people with moderate to severe loss of autonomy while they are in contact with health workers or in a community setting.

The SMAF reference tool

The SMAF\(^2\) is a component of the multi-client assessment tool. This tool has been widely used throughout Québec since the spring of 2002 by the Quebec Ministry of Health and Social Services to evaluate the autonomy of elderly people. Using epidemiological data and monitoring the distribution of ISO-SMAF Profiles\(^1\), a group of clinical practitioners in geriatrics found an SMAF score of \( \geq 15 \) to be the most accurate indicator of a moderate to severe loss of autonomy.
Why is this study needed?

We could ask any number of questions to determine whether or not an elderly person is experiencing loss of autonomy or, better yet, we could administer the complete SMAF tool.

Are there any targeted questions that would give me an accurate indication as to whether or not the person before me has an SMAF score of \( \geq 15 \)?

This research was conducted to come up with these questions. Obviously, if we have to ask 100 questions to determine whether or not someone has a high SMAF score, it would be less time consuming to administer the SMAF directly. There are statistical analysis methods for determining how close a connection there is between a series of questions and a test result: namely the SMAF score. Obviously, the more questions we ask, the more accurate the result will be.

This is the choice we face: do we want an abridged tool that is closely linked with an SMAF score of \( \geq 15 \), or do we want to administer the complete SMAF?

The study was designed to help us develop an abridged tool; our goal was not to draw up a list of questions that would take as long to administer as the SMAF itself (which takes between 15 and 20 minutes to complete).

Naturally, we may often feel that some questions are lacking or that another element is just as important, but our analyses demonstrated, beyond a shadow of a doubt, that other questions are not as effective in terms of being closely linked with an SMAF score of \( \geq 15 \). Below please find a list of topics that were studied during this research project.

Study methodology

The list of questions analyzed was drawn up following a review of scientific and clinical literature on loss of autonomy by a committee of clinical geriatric experts. They selected a list of 23 questions that targeted the main problems associated with loss of autonomy in elderly people that could be answered by a “yes” or “no.”

These questions dealt with falls, medication, memory lapses, the need for assistance, nutrition, emotional health, hospitalization, activity/mobility restraints, deafness, vision, age, gender, etc.

The study was carried out with 594 elderly people chosen at random in the Sherbrooke area; they answered the 23 questions and were then evaluated at home with the SMAF tool. As a preliminary analysis,
each question was associated with an SMAF score of ≥ 15. This enabled us to compile an initial list of meaningful questions (Chi square). Subsequently, an analysis of multivariate statistical regression made it possible to pinpoint the most effective questions associated with an SMAF score of ≥ 15. Lastly, sensitivity and specificity analyses made it possible to study various threshold scores, that is, the number of positive responses the elderly person had to provide to be considered to be at risk.

**Results**

From among the list of 23 questions, 7 were identified as the best descriptors of an SMAF score of ≥ 15. The other questions we studied proved to be less effective at describing a high SMAF score.

**Administering the questionnaire**

This tool has proven effective at identifying the targeted individuals, namely frail elderly persons. Should stakeholders exercise caution when administering the questionnaire? YES!

1. First and foremost, do not indicate that a YES answer is an at risk response.
2. The correct response = the individual’s own response:
   • Since the questionnaire was validated by mail, no one was able to influence the participants’ responses
   • Do not attempt to interpret participants’ responses
   • Do not influence participants’ responses when asking the questions
   • Avoid making any judgments (i.e. he/she answered “no” but I think it should be “yes”)
3. Should the participant hesitate between yes and no, ask him or her to choose one of the two responses.
4. If, despite several attempts, he or she persists in answering “a little” or “at times,” enter yes as the correct response.
5. Question # 6 is correct:
   “In case of need, can you count on someone close to you?”
   • A yes response is the one that indicates that a more in-depth evaluation is required.
• It is likely that simply being able to identify this person indicates that the participant felt the need of assistance. While this result may be surprising, it is correct; it was measured with the 594 people who took part in the study. Those who replied no to this question enjoy greater autonomy than those who responded yes. An elderly person who does not identify someone that he or she can count on in case of need is more autonomous.

6. Do not tell participants whether they have been identified as positive or negative
• It may cause unnecessary worry if we tell them they are at risk of something
• Say: “If necessary, the single entry point or a health care worker will contact you.”
• What happens next: A more in-depth evaluation if the respondents gave 3 or 4 or more positive answers. That’s all!

7. What will happen after responding to the questionnaire? A more in-depth evaluation may be conducted (if the participant answered yes four times or more). That’s all!

PRISMA-7 questions & answers
Is the response valid if a helper answers the questions?
Yes, provided he or she is very familiar with the elderly person and knows how he or she would respond. The proprietor of a seniors’ residence may also answer for an elderly person, provided he or she is very familiar with the person and knows what he or she would respond. The best source of information is, nevertheless, the elderly person.

Question #1: Are you over 85 years of age?
Why the age criterion?
It is common knowledge that the very elderly experience greater loss of autonomy than those who are not as old. But at what age can we truly claim that there is a very high risk? Beginning at 80? 90? 82? With the study data, the 85-year-old threshold proved to be the most closely associated with moderate to severe loss of autonomy. However, that constitutes only a single additional risk factor, it does not mean the questionnaire is restricted to those 85 and over; it is aimed at people 65 years and over. A 72-year-old who provides 4 other positive responses has less
autonomy than a 90-year-old with a single positive response to the Prisma-7, i.e. that he or she is 85 or older.

**Question #2: Male?**

Why are men considered to be at greater risk?

It is common knowledge that men are less autonomous than women in terms of certain domestic chores. This was also confirmed during this study; being a man is closely associated with a moderate to severe loss of autonomy.

**Question #3: ... do you limit your activities**

If the person does not understand this term, try *cut down on your activities* instead.

**Question #4: ... regularly assist you**

If the person asks what we mean by regularly, it is *his or her* definition of *regularly* that counts, so ask “does regularly mean every week or every day to you?” If the respondent says *every week*, reformulate the question as follows: “Do you need someone to help you on a *weekly* basis?”

**Note on the Polish questionnaire**

There is a small Polish community in the Eastern Townships. Since one of the PRISMA research agents is also of Polish origin, she readily agreed to do the translation to ensure that the respondents were able to answer in their language of origin whenever language presented any barrier to complete understanding.
What happens to those with a positive evaluation?

An elderly person identified as positive by the PRISMA-7 must undergo the SMAF evaluation to determine his or her degree of autonomy.

As with any a screening test, positive results include true positives (the ones we are looking for) and false positives. Only an SMAF evaluation makes it possible to differentiate between the two. But PRISMA-7 makes it possible to reduce by two-thirds the number of people that have to undergo an immediate SMAF evaluation, since the test identifies 35.5% as positive (with a threshold of 3 or more yes answers). In the case of a threshold of 4 or more yes answers, only 19% were identified as positive, which eliminates 81% of those requiring evaluation. Obviously, at this point, sensitivity is reduced, but specificity increases to a significant degree. It is up to the decision-makers and clinical practitioners to select the desired threshold in terms of the process for evaluating new cases of elderly persons in their teams. Some teams decided...
to start with a threshold of 4 or more yes answers, but once they had hit their stride they lowered the threshold to 3 or more positive responses.

Regardless of what we might hope, no screening test is 100% accurate. Even the Pap smear for uterine cancer is not 100% accurate, although it is very widely used. Moreover, sensitivity to the Pap test is similar to the PRISMA-7. For this type of questionnaire, effective results allow us to recommend it and to use it extensively.

Prevalence of moderate to severe loss of autonomy in a targeted population

The PRISMA-7 validation was carried out with a sample of elderly persons selected at random. The prevalence (frequency at a specific time) of moderate to severe loss of autonomy in non-institutionalized people 75 and over stands at 21%. Obviously, the frequency of moderate to severe loss of autonomy is greater in elderly persons who visit health care providers or receive health services. Fully autonomous elderly persons visit physicians far less frequently. Consequently, if the PRISMA-7 was used, for example, on elderly persons visiting a CLSC, the percentage of those with moderate to severe loss of autonomy would be far greater than among the elderly members of a golf club. Moderate to severe loss of autonomy exceeding 21% is to be expected among elderly CLSC patients.

Clinical practitioners used the PRISMA-7 solely for elderly people whom they considered to be at risk. A high percentage of them were identified positive by the PRISMA-7. Is it normal to obtain this high a percentage?

One thing is certain, it is hardly surprising! The certainly tends to indicate that the intuition of the experienced clinical practitioners is confirmed by this PRISMA-7 result. By targeting, from the outset, individuals identified as frail by a clinical practitioner, the frequency will be far higher than the 21% also in this situation.

The PRISMA-7 cannot replace intuition or clinical judgement, rather, it supports it by documenting and quantifying the likelihood of dealing with an elderly person experiencing loss of autonomy. Previously, only a more in-depth evaluation made it possible to determine whether this was the case. PRISMA-7 permits an initial vetting in cases that should be evaluated first. The next step is to evaluate the elderly person with the SMAF.
Note on PRISMA-7 and case managers

Some Québec regions have a team of case managers involved in setting up the integrated services network for elderly people. A positive PRISMA-7 result does not mean that the person must be assigned a case manager. While this may be the case, only a more in-depth evaluation can answer this question.

\[
\text{positive PRISMA-7} \neq \text{The need for case manager} \\
\text{positive PRISMA-7} = \text{The need for a more in-depth evaluation}
\]

When is the PRISMA-7 required?

The PRISMA-7 may be used in a single entry point, it may be administered by telephone, by clinical practitioners or volunteers trained to use it (see instructions), by homecare workers, in emergency rooms or by volunteers (Meals on Wheels, for example). Some clinical teams plan to use it during the campaign for vaccinating the elderly against the flu, which is an excellent opportunity for more comprehensive tracking.

Conclusion

• Identifying at-risk individuals during visits with stakeholders is an innovative way to make major advances in public health;
• It provides us with a valid and effective tool for identifying frail elderly persons;
• It provides us with an excellent opportunity to identify these frail elderly people before their loss of autonomy becomes too severe, thereby increasing the potential for intervention;
• We can then ensure that they receive a more in-depth evaluation to determine the care and services their condition requires.

Different versions of the PRISMA-7 questionnaire

Note about the different versions

Most of the people administering the questionnaire altered the format to include a space for a Medicare number and the establishment’s logo. We have no problem with these modifications. However, we did stipulate that the wording of the questions remain unchanged, since the analysis
was carried out using these questions and we cannot provide any guarantees as to the validity of any that may have been changed.

Both the self-administered questionnaire and the one administered by a stakeholder are aimed at exactly the same individuals, i.e. those 65 and over; only the visual presentation and the tone of some of the information was changed. For example, we have removed the phrase “elderly person with moderate to severe loss of autonomy” in the questionnaire title in order to prevent unnecessary worry on the part of elderly people who may complete the self-administered version, and in order to avoid influencing their responses. This questionnaire is not limited to those 85 and over; it is aimed at all elderly patients. See section entitled “Prisma-7 questions and answers.”
PRISMA-7 Questionnaire
To identify elderly people with a moderate or severe loss of autonomy

Does this person have a case manager?
If yes, send the information you have on the person’s health to the case manager, and do not complete this questionnaire.

If this person does not have a case manager, do you know his/her “up-to-date” SMAF score?
If yes, do not complete this questionnaire. If his/her score is >15, refer the person’s file to the single entry point.

This questionnaire is designed for elderly people who do not have a case manager and whose SMAF score is not known.

Instructions
For questions 3 through 7, do not interpret the answer, simply note the person’s answer without considering whether or not it should be Yes or No. If the respondent hesitates between Yes and No, ask him/her to choose one of the two answers. If, despite several attempts, he/she persists in answering “a little” or “at times”, enter Yes.
Identity of the questionnaire respondent
First name: ______________________________________
Family name at birth: ______________________________
Address: ________________________________________
Municipality:_____________________________________
Postal code: ______________________________________
Telephone #: _____________________________________
MIN: ___________________________________________

Identity of the person who administered the questionnaire
First name: ______________________________________
Family name: ____________________________________
Organization: ____________________________________
Telephone #: _____________________________________

Instructions
If the respondent had 3 or more yes answers, send this questionnaire or the results to the single entry point for elderly people in your territory
Telephone # of the single entry point: __________________
Fax # of the single entry point: _______________________

* Note:
A “yes” response to question # 6 truly constitutes a person at risk, contrary to what you might previously have believed.

Source:
This questionnaire was developed and tested by the team directed by Dr. Réjean Hébert of the Research Centre on Aging of the Sherbrooke University Geriatrics Institute. Should you require any additional information about this questionnaire or wish to make any suggestions, please contact Michel Raîche at (819) 829-7131 extension 2652.

Document updated: November 2003
(self-administered English version)

PRISMA

Questionnaire for persons aged 65 years and older
Questionnaire on health and autonomy

Do you have a case manager?
If yes, you don’t need to complete this questionnaire.

Instructions:
There are no correct answers, your answers are the correct ones. Indicate spontaneously what you think and give the questionnaire to a person in charge.

<table>
<thead>
<tr>
<th>Identification:</th>
</tr>
</thead>
<tbody>
<tr>
<td>First name:</td>
</tr>
<tr>
<td>Last name:</td>
</tr>
<tr>
<td>Address:</td>
</tr>
<tr>
<td>City:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Circle your answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In general, do you have any health problems that require you to limit your activities?</td>
<td>Yes</td>
</tr>
<tr>
<td>2. Do you need someone to help you on a regular basis?</td>
<td>Yes</td>
</tr>
<tr>
<td>3. In general, do you have any health problems that require you to stay at home?</td>
<td>Yes</td>
</tr>
<tr>
<td>4. In case of need, can you count on someone close to you?</td>
<td>Yes</td>
</tr>
<tr>
<td>5. Do you regularly use a cane, a walker or a wheelchair to move about?</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Consent form
In the health network, we must ensure confidentiality whenever we send clinical information. In some cases, it may be necessary to use a consent form with the PRISMA-7, such as in a community context (for example,
a home services coop, Meals on Wheels, etc.). These organizations are not covered by health establishment consent forms. You must therefore ask the elderly person for their authorization before sending their PRISMA-7 responses to the health network, for example, the single entry point or their family physician if the person expresses any reluctance.

See the next page for a sample consent form that could be used, for example, by Meals on Wheels, in MRC Memphrémagog (designed by Paul Martel, Community Organizer in Magog).

Some community organizations in the Townships have requested feedback about the people they refer to a single entry point, whenever they get a positive PRISMA-7 score. They are not requesting confidential information, they simply want to be informed as to whether or not the person was contacted and when he or she will be evaluated.

An elderly person may refuse to respond to a volunteer. Should the volunteer believe that the physical or psychological health of the elderly person is threatened, there is a law that protects persons acting in good faith in order to protect the health of another individual, for example, by calling the single entry point to inform it of the condition of an elderly person whose condition gives just cause for alarm. The law was passed in December 2001.

Act 180, an Act to amend various legislative provisions as regards the disclosure of confidential information to protect individuals.

Authorizes the transmission of confidential information without the consent of the person involved in situations where there is reason and probable cause to believe that the imminent danger of death or severe injury (physical or psychological) threatens one or more persons.

The communication of information must be limited to information required for the purposes for which the communication is intended and may only involve the person or persons exposed or those that may offer to assist them.
Consent to transfer the questionnaire PRISMA-7

I understand that this questionnaire is used to determine whether I may benefit from a more detailed evaluation of my autonomy. If it is required, a health professional may determine my needs and the services I may receive.

I agree to answer these questions knowing that my answers may be transmitted to the single-entry point of services of the (name of establishment) which will contact me if required.

I authorise the (.............) single-entry point of services to do a follow-up with the referring organization or the health professional who administered the questionnaire.

_______________________________________ ______________
Signature of the person or a representative date

_______________________________________
Telephone number

_______________________________________ ______________
Signature of the referring organization date

_______________________________________
Telephone number
Choice of the threshold score for the PRISMA-7 questionnaire

Two threshold scores proved effective when administering the PRISMA-7. You will find below the results obtained during the analyses, applied to a sample population of 1,000 elderly people. The charts illustrating the results for these two scores are presented on the pages following the bibliography.

Questionnaire’s ability to identify the targeted patients

$$\text{SMAF} \geq 15$$

In other words...

We know that the prevalence of moderate to severe loss of autonomy (SMAF $\geq 15$) is approximately 21% for elderly people 75 and over living at home.

As such, for a sample of 1,000 elderly persons 75 and over, 210 of them have moderate to severe loss of autonomy.

It is these 210 people that we want to identify through the tracking questionnaire.

If we ask 1,000 people to answer the questionnaire, 355 of them would have a positive score with a critical threshold of 3 or more yes answers. A more in-depth evaluation (SMAF) of these 355 people makes it possible to identify 164 people with moderate to severe loss of autonomy.

Therefore, with a threshold of 3 or more yes answers:

- 355 evaluations out of 1,000 are needed to identify 164 of the 210 targeted individuals;
- 46 of the 210 people targeted are not identified by the process.

Similarly, with a threshold of 4 or more yes answers:

- 190 evaluations make it possible to identify 128 of the 210 targeted persons;
- 82 of the 210 targeted individuals are not identified by the process.

<table>
<thead>
<tr>
<th>Critical threshold</th>
<th>Positive</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 yeses or more</td>
<td>35.52%</td>
<td>78.26%</td>
<td>74.74%</td>
<td>42.65%</td>
<td>93.47%</td>
</tr>
<tr>
<td>4 yeses or more</td>
<td>19.02%</td>
<td>60.87%</td>
<td>91.02%</td>
<td>61.95%</td>
<td>90.64%</td>
</tr>
</tbody>
</table>
These figures correspond with a sample for whom we have no SMAF score. Naturally, in reality, some of these 210 people living at home or in seniors’ residences have already undergone an SMAF evaluation, since some of them already receive services and have been evaluated previously.

Each option has its own advantages; it is up to the teams involved in evaluating the elderly people to choose the threshold score that suits their own intervention priorities and organization. These teams must determine who will evaluate the individuals identified as positive through PRISMA-7, how the information will be forwarded to them and how many evaluations they can carry out.

Bibliography

These results are taken from a new analysis of the data used in the following publications:


An article is in progress on PRISMA-7:


Additional references:


Table 8.1
Ability of the PRISMA-7 questionnaire to identify the targeted clients, threshold = 3

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Loss of autonomy (SMAF ≥15)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Positive (≥3)</td>
<td>164*</td>
<td>191*</td>
</tr>
<tr>
<td>False positives</td>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td>False negatives</td>
<td>c</td>
<td>d</td>
</tr>
<tr>
<td>Negative (≤2)</td>
<td>46*</td>
<td>599*</td>
</tr>
<tr>
<td></td>
<td>a + c</td>
<td>b + d</td>
</tr>
</tbody>
</table>

Positive predictive value = \( \frac{a}{a + b} = 42.65\% \)

Negative predictive value = \( \frac{d}{c + d} = 93.47\% \)

Sensitivity = \( \frac{a}{a + c} = 78.26\% \)

Specificity = \( \frac{d}{b + d} = 74.74\% \)

Prevalence = \( \frac{a + c}{a + b + c + d} \times 100 = 21\% \)

* The percentages and number of subjects differ since the number of subjects was rounded off to illustrate the example on a sample of 1,000 people.
### Table 8.2

<table>
<thead>
<tr>
<th>Loss of autonomy (SMAF ≥ 15)</th>
<th>No</th>
<th>Positive (≥ 4)</th>
<th>Negative (≤ 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>62*</td>
<td>190*</td>
<td>210*</td>
</tr>
<tr>
<td>No</td>
<td>128*</td>
<td>62*</td>
<td>78*</td>
</tr>
</tbody>
</table>

#### Calculation Details

- **Positive predictive value (≥ 4):**
  \[
  \frac{a}{a+b} = \frac{60.87\%}{60.87\%} = 60.87\%
  \]

- **Negative predictive value (≤ 3):**
  \[
  \frac{c+d}{c+d} = \frac{90.64\%}{90.64\%} = 90.64\%
  \]

- **Prevalence:**
  \[
  \frac{a+b+c+d}{a+b+c+d} = 21\%
  \]

- **Sensitivity:**
  \[
  \frac{a}{a+c} = \frac{60.87\%}{60.87\%} = 60.87\%
  \]

- **Specificity:**
  \[
  \frac{d}{b+d} = \frac{91.02\%}{91.02\%} = 91.02\%
  \]

*The percentages and number of subjects differ since the number of subjects was rounded off to illustrate the example on a sample of 1,000 people.*