MASTER THESIS HEALTH SCIENCES

PROFESSIONAL CONSIDERATIONS IN CHOOSING A TREATMENT FOR NEUROPSYCHIATRIC SYMPTOMS IN DEMENTIA PATIENTS

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PREFACE

This master thesis is the result of my graduate research that I have conducted within the framework of the master Health Sciences at the University of Twente. Within this master I followed the specialization track Health Services and Management. During the courses of this track, especially the course Quality and Safety in Healthcare, the subject 'medication safety' got my attention. I learned about the problems in this area, and that many improvements are possible. In consultation with Dr. Jeannette van Manen, I decided to focus on this subject within my graduate research. Within larger research by PhD-student Sarah Janus, my goal was to investigate the elderly care physicians' preferences in the treatment for neuropsychiatric symptoms in dementia. In other words; what are, according to the elderly care physicians' view, important factors in choosing a treatment and how do they evaluate the treatment options? The importance of answering these questions could be found in the fact that antipsychotics, a treatment option, are prescribed too much to dementia patients with neuropsychiatric symptoms. Prescribing antipsychotics for these vulnerable patients is becoming highly controversial since these drugs are associated with many severe side effects while the effectiveness is low. In the past, several researchers investigated the factors related to the prescribing behaviour of psychotropic drugs and antipsychotics. In the results of these studies, differences were found regarding the relative importance of some factors. In addition, most of the researchers in earlier studies mainly focussed on statistical associations between the factors and prescribing behaviour. They analysed the associations between many factors and the resulting prescribing behaviour, but not the direct opinion of the professionals about what they consider as important factors influencing their treatment decisions. Furthermore, the few researchers focusing on the direct opinion of the professionals performed mainly explorative studies. Therefore, a quantitative assessment of the professional opinion remains unclear. This study will analyse the professional considerations in choosing a treatment for neuropsychiatric symptoms in dementia. The results may explain the overutilization of antipsychotics.

Through this way, I would like to thank a number of people who contributed to this research. I would like to thank Dr. Jeannette van Manen and Sarah Janus, MSc, for creating this master thesis and guiding me through this. Also I would like to thank Dr. Janine van Til. She supported me as co-reader and advised me about several topics, especially in the design and results phase. Finally, I would like to thank all the people from Carrintreggeland, especially Henk Snijders, MSc, for their assistance and support during this master thesis.

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ABSTRACT

Background

Dementia is often complicated by manifestations of neuropsychiatric symptoms. Dutch guidelines recommend non-pharmaceutical psychosocial interventions as first-line treatment for neuropsychiatric symptoms. However, antipsychotics are very often prescribed as treatment for these symptoms. Prescribing antipsychotics is becoming highly controversial, because antipsychotics are associated with serious adverse events and the effectiveness is modest.

The aim of this study was to understand the professional considerations in choosing a treatment for dementia patients with neuropsychiatric symptoms, by analysing the importance, according to elderly care physicians, of the factors related to choosing the treatment, by analysing the perceived performance of the treatment options, and by analysing the expected treatment choice.

Methods

A total of 57 elderly care physicians, employed at nine different nursing home organizations in the region of Twente, were asked to fill in a questionnaire. To create this questionnaire, a comprehensive literature research was conducted to identify which factors could influence the treatment decision for neuropsychiatric symptoms in dementia. Best Worst Scaling (BWS), case 1, was used to measure the relative importance of 13 attributes, which were selected out of the literature. Also, a relative performance measurement was used to identify the perceived performance of the treatment options.

Results

From the 57 contacted elderly care physicians, 19 respondents completed the questionnaire. The elderly care physicians considered the occurrence and severity of the neuropsychiatric symptoms as most important attribute related to choosing a treatment for neuropsychiatric symptoms in dementia. Three other important attributes are: effectiveness, side effects and severity of the health impairments. The elderly care physicians considered costs as least important attribute related to choosing a treatment for neuropsychiatric symptoms in dementia.

A lot of variation was found with regard to the perceived performance of the treatment options. The elderly care physicians indicated that the non-pharmaceutical treatment performs better than the antipsychotic treatment, with regard to some attributes such as effectiveness, side effects, and situations with severe health impairments. When considering the performance of the treatment options with regard to other attributes such as the required time, ease of use, ease of implementation, situations with severe en frequent neuropsychiatric symptoms, or when the pressure by nurses to intervene is high, the elderly care physicians indicated that the antipsychotic treatment performs better compared to the non-pharmaceutical treatment.

The elderly care physicians preferred to use the non-pharmaceutical treatment for neuropsychiatric symptoms in dementia. 58% of the elderly care physicians in this study will probably choose for the non-pharmaceutical treatment, while 42% will choose for the antipsychotic treatment, when considering the treatment options with regard to the 13 attributes.

Conclusion

Elderly care physicians consider patient related attributes with great importance in the treatment decision for neuropsychiatric symptoms in dementia, next to the effectiveness and side effects of the treatment options. Furthermore, elderly care physicians indicate that the performance of the antipsychotic treatment is better with regard to attributes such as required time and ease of use, but is worse with regard to attributes such as effectiveness and side effects, compared to the performance of the non-pharmaceutical treatment. Overall, elderly care physicians will probably use the non-pharmaceutical treatment more than the antipsychotic treatment for neuropsychiatric symptoms in dementia. However, one can still speak about overutilization, if an overall preference for antipsychotics in 42% of the cases will actually lead to real prescriptions. Possible solutions to reduce overutilization of antipsychotics are improving the ease of use, ease of implementation and required time of non-pharmaceutical options. Another possible solution is supporting the nurses by allowing them to make better use of the non-pharmaceutical treatment. More research should be conducted to investigate if the proposed solutions will actually reduce the use of antipsychotics in dementia patients with neuropsychiatric symptoms.

Key words

Dementia, neuropsychiatric symptoms, preferences, professional considerations, Best Worst Scaling (BWS), antipsychotics, non-pharmaceutical treatment

INTRODUCTION

Dementia is often complicated by manifestations of neuropsychiatric symptoms, also referred to as behavioural and psychological symptoms, with a prevalence varying between 72% and 90% (1-3). In an international trial among 537 patients with dementia, it was shown that 89% of the patients presented at least one symptom, measured on the Neuropsychiatric Inventory (NPI) 10 item scale. The most common symptoms were depression (58%), apathy (54%), anxiety (49%), and hallucinations (44%) (4). In a cross-sectional cohort study among 1322 dementia patients in Dutch nursing homes, similar results were found; more than 80% of the patients suffered from at least one symptom, as defined with the Neuropsychiatric Inventory Nursing home version (NPI-NH) frequency severity score. Agitation/aggression, apathy and irritability were the most frequently observed behaviours, with prevalences of 30-35% (5).

Dutch guidelines recommend non-pharmaceutical interventions as first-line treatment for neuropsychiatric symptoms in dementia. They advise to use personalized psychosocial, cognitive, sensory or behavioral treatments, social activities, physical exercise, and alternative therapy such as music therapy and aromatherapy. Pharmaceutical treatments should be handled with caution and may only be used when it appears that non-pharmaceutical treatments are ineffective (6, 7). Furthermore, if pharmaceutical treatment is needed, this should always be done in addition to or in combination with non-pharmaceutical treatments, and does not replace the non-pharmaceutical treatment (8).

Despite the recommendations in the guidelines, psychotropic drugs, such as antipsychotics, are too often and for extended periods prescribed as first line treatment for neuropsychiatric symptoms in dementia (9-11). In a study in North Carolina, it was shown that physicians recommend using psychotropic drugs as primary treatment in 55% of the cases. Only 22% of the respondents recommended psychosocial treatments as primary strategy (12). In a descriptive study among dementia patients in nursing homes in Michigan, it was revealed that 37.4% of the participants received antipsychotics (13). Exactly the same percentage of antipsychotic drug use was shown in a sample of dementia patients in Dutch nursing homes (14). The results of other studies were comparable, ranging from 27.4% to 38%, where most patients received atypical agents (4, 11, 15, 16).

The frequent use of antipsychotics is remarkable, since the effectiveness of antipsychotics in the treatment for neuropsychiatric symptoms in dementia is modest (17-20). Kleijer et al. found out that only 18.2% of the elderly nursing home dementia patients being treated with antipsychotics, improved on a behaviour score while 36.8% deteriorated after three months, compared with before the start of the therapy (21). Adverse effects further limit the overall effectiveness of antipsychotics (22). One of the most frequent side effects of antipsychotics among dementia patients are extrapyramidal symptoms (movement disorders such as parkinsonism and dysphagia) (23-26). Schneider et al. investigated the adverse effects of atypical antipsychotics for dementia, and concluded that atypical antipsychotics are associated with a 1.51 times higher risk of extrapyramidal symptoms compared to non-use (18). Older adults receiving conventional agents are even 1.3 times more likely to develop these symptoms compared to those using atypical agents (27). Treatment with antipsychotics among dementia patients has been linked also to an increased risk of

cerebrovascular events (18, 20, 28, 29), sedation or somnolence (18, 26, 30, 31), cognitive decline (18, 32, 33), and injuries or falls (18, 34, 35). Furthermore, the risk of developing any serious event leading to acute hospitalization is 3.2 times higher after receiving atypical drugs, and even 3.8 times higher after receiving conventional antipsychotic drugs, relative to those who receive no antipsychotics (36). Also, many researchers investigated the association between antipsychotics and mortality among dementia patients. The antipsychotic treatment, both conventional and atypical, is associated with an increased risk of death (37-41). Taken together, antipsychotics are highly controversial.

To understand the overutilization of antipsychotics in dementia, several researchers investigated the factors related to the prescribing behaviour of psychotropic drugs and antipsychotics, as for example done by Zuidema et al. (10). It was revealed that treatment decisions are multifactorial. Firstly, factors related to the treatment are relevant in these kinds of decisions, such as the evaluation of the clinical effectiveness, side effects and costs (42-44). When physicians expect high effectiveness and minimum side effects of a treatment, this will probably, regardless of other factors, increase the use of this treatment. Also, patient factors such as the severity of the health impairments, and physician factors such as the time they have to evaluate a patient, could influence the treatment decision (16, 45-47). Finally, some factors which may be grouped under the heading 'nursing home indicators related to staff distress and work pressure', such as the staff/patient ratio, could be related to the treatment decision. For example, when the staff/patient ratio per nursing unit is low, physicians can feel work pressure. This work pressure could increase antipsychotic drug prescriptions; busier practices tend to prescribe more (13, 42, 48). Furthermore, a poor nurse-to-patient ratio was seen as barrier to use non-pharmacological interventions (49) (for more information, see appendix A).

In the results of earlier studies, differences were found regarding the relative importance of some factors related to choosing a treatment, such as the importance of costs. Buusman et al., who investigated how prescribers choose between drugs, revealed that prescribers consider costs with the same importance as clinical effectiveness and safety (48). Results of other studies were contradicted to that conclusion; according to the participants of a study by the Department of Health, costs are always secondary to clinical efficacy and safety (42). Another example is the importance of the staff/patient ratio. Kim and Whall revealed a significant association between low levels of nursing staff and the use of psychotropic drugs (13). However, Zuidema et al. did not find an association between the staff/patient ratio and antipsychotic drug use (10).

In addition, most of the researchers in earlier studies mainly focussed on statistical associations between the factors and prescribing behaviour. They analysed the associations between many factors and the resulting prescribing behaviour, but not the direct opinion of the professionals about what they consider as important factors influencing their treatment decisions. Furthermore, the few researchers focusing on the direct opinion of the professionals performed mainly explorative studies. Therefore, a quantitative assessment of the professional opinion remains unclear. Insight into the elderly care physicians' opinion about the importance of the factors, combined with their opinion about the performance of the treatment options, is important to reveal stated preferences of elderly care physicians. This would give much insight into the decision making process and may explain the overutilization of antipsychotics.

The aim of this study is to identify the professional considerations in choosing a treatment for dementia patients with neuropsychiatric symptoms. This will be done by analysing the importance of the factors related to choosing the treatment, according to elderly care physicians. Secondly, the perceived performance of the treatment options, the antipsychotic treatment and the non-pharmaceutical treatment, will be identified regarding each factor. Finally, the expected treatment choice will be identified.

METHODS

Study design and participants

Between May 12th and June 13th 2014, 57 elderly care physicians were asked to fill in an online questionnaire. These physicians were employed at nine different nursing home organizations in the region of Twente. The results were handled anonymously.

Questionnaire design

A comprehensive literature search was conducted to identify possible factors influencing treatment decisions. The following search terms were used in Pubmed, ScienceDirect and Google Scholar; 'factors', 'determinants', 'attributes', 'influences', 'influencing', 'affecting', 'treatment', 'prescribing', 'decision', 'antipsychotic', 'psychotropic', 'drugs', 'medicines', 'drug use', 'neuropsychiatric symptoms', 'dementia patients', and 'nursing homes'. In total 77 factors were found that could have a relation with treatment decisions. Many of these factors were excluded later on because of three reasons. The first reason to exclude a factor was: the factor could be related to treatment decisions between drugs, but not to treatment decisions between drugs and non-drug options. The second reason was that some factors were mutually related or had a similar meaning. The third reason to exclude a factor was that the importance of the factor, or the performance of the treatment options with regard to the factor, could not be measured. Factors included were attributes of a treatment or treatment setting; with regard to these attributes, elderly care physicians should be able to make treatment decisions for neuropsychiatric symptoms in dementia. At the end, a list of 13 attributes was created (see appendix A for more information).

Best Worst Scaling (BWS), case 1, was used for ranking the 13 attributes based on their importance (see appendix B for an explanation of the decision to use BWS). This method was introduced by Finn and Louviere in 1992 (50). BWS is based on the idea that when individuals evaluate three or more attributes on a subjective scale, their choices of the top and bottom attributes should be more reliable than choices of attributes in between. In the BWS, respondents were provided choice sets of four attributes per set, and chose the most important and least important from each set (51). The choice sets were designed by using a balanced incomplete block design (BIBD). This is an experimental design in which each choice option appears equally often, and co-appears equally often with each other choice option. Several BIBDs were available (52). For this study, a BIBD was chosen with 13 objects (because the importance of 13 attributes had to be analysed), with 13 choice sets, four repetitions per object, a set size of four objects, and in which each pair of objects appeared one time (see table 1). Table 2 gives an example of a BWS question.

Table 1. BIBD of 13 objects.

Set	Object names			
1	Average educational level of the nurses	Severity of health impairments	Ease of use	Side effects
2	Occurrence and severity of neuropsychiatric symptoms	Effectiveness	Ease of implementation	Ease of use
3	Pressure by family of the patient to intervene	Ease of use	Required time	Average number of nurses per patient
4	Ease of use	Pressure by nurses to	Available time to evaluate	Costs

		intervene	a patient	
5	Required time	Costs	Side effects	Effectiveness
6	Pressure by nurses to intervene	Side effects	Average number of nurses per patient	Occurrence and severity of neuropsychiatric symptoms
7	Side effects	Ease of implementation	Pressure by family of the patient to intervene	Available time to evaluate a patient
8	Effectiveness	Pressure by family of the patient to intervene	Average educational level of the nurses	Pressure by nurses to intervene
9	Available time to evaluate a patient	Average educational level of the nurses	Occurrence and severity of neuropsychiatric symptoms	Required time
10	Ease of implementation	Average number of nurses per patient	Costs	Average educational level of the nurses
11	Average number of nurses per patient	Available time to evaluate a patient	Effectiveness	Severity of health impairments
12	Costs	Occurrence and severity of neuropsychiatric symptoms	Severity of health impairments	Pressure by family of the patient to intervene
13	Severity of health impairments	Required time	Pressure by nurses to intervene	Ease of implementation

Table 2. Example of a BWS question.

Set 1: Which attribute is the most and which attribute is the least important for you in choosing the treatment for dementia patients with neuropsychiatric symptoms?		
Most important		Least important
□	Average educational level of the nurses	□
□	Severity of health impairments	□
□	Ease of use	□
□	Side effects	□

A relative performance measurement was developed to identify the performance of the treatment options, the antipsychotic treatment and the non-pharmaceutical treatment, according to elderly care physicians, with regard to the 13 attributes. These attributes were shown in the questionnaire as treatment goals, such as highest effectiveness, and particular situations, such as a situation with severe health impairments. The respondents had to indicate the extent to which the antipsychotic treatment had a higher or lower perceived performance compared to the non-pharmaceutical treatment with regard to each of the stated objectives or situations. The respondents were shown a scale from '6' to '6', with '0' in between. '6' was the maximum score for the perceived performance of one of the treatment options, and by scoring '0', respondents were able to indicate that they consider the performance of the treatment options as equivalent. See table 3 for an example of a 'perceived performance' question.

Table 3. Example of a 'perceived performance' question.

Question: When your goal is to choose a treatment for neuropsychiatric symptoms in dementia with the highest effectiveness, which treatment do prefer? And to what extend on a scale of 6?												
Antipsychotic treatment						Neutral	Non-pharmaceutical treatment					
6	5	4	3	2	1	0	1	2	3	4	5	6
□	□	□	□	□	□	□	□	□	□	□	□	□

Lastly, four background questions were added to the online questionnaire, about age, gender, years of work experience and if they recently prescribed antipsychotics. The complete questionnaire can be found in appendix C.

Data analysis

The BWS results were analysed by calculating $F(M)_a$ and $F(L)_a$, which represent the total number of times that each attribute, *a*, was counted most important ($F(M)_a$) and least important ($F(L)_a$) over all choice sets *n* (for the equations, see (1) and (2) in table 4). After that, a calculation was made of the first outcome measure: $F(M)_a - F(L)_a$. This is a subtraction of the total number of times the attribute was chosen as least important from the total number of times the attribute was chosen as most important over all choice sets, see (3), and indicates the level of importance (51). The level of importance could be interpreted as a relative scale in which higher scores represent a higher importance in choosing a treatment for neuropsychiatric symptoms in dementia. Also a second outcome measure was determined: $SQRT((F(M)_a +1)/(F(L)_a +1))$. This is the square root of most important counts plus one, divided by least important counts plus one, see (4). The plus one was added to the counts, because it is not possible to divide by zero. $SQRT((F(M)_a +1)/(F(L)_a +1))$ is proportional to the most important counts, and could also be interpreted as a relative scale (53). The square root of the ratio was transformed into W_a, the third outcome measure. W_a is the attribute importance weight. This weight was calculated by dividing the square root of the ratio by the sum of the squares, see (5). W_a also indicates the relative importance of the attributes related to choosing a treatment for neuropsychiatric symptoms in dementia.

All the above calculations were made for aggregates of individual responses. Because each of the 13 attributes appeared at total of four times in the BWS, individual most important and least important counts could be four at maximum. Using individual counts would result in less variation between the weights, compared to using the sum of the counts over all respondents. Most important and least important counts could vary, in that way, up to four multiplied with the number of respondents.

Identifying the perceived performance of the treatment options with regard to the 13 attributes, was done by showing the percentage of respondents who evaluated the performance of the treatment options with a certain score. The number of response categories was reduced from six categories to three for each treatment option.

Also, a performance score was calculated for the treatment options: $P(AP)_a$ and $P(NP)_a$. $P(AP)_a$ is the perceived performance of the antipsychotic treatment with regard to each attribute, and $P(NP)_a$ is the perceived performance of the non-pharmaceutical treatment with regard to each attribute, according to elderly care physicians. $P(AP)_a$ and $P(NP)_a$ were calculated by recoding and normalising the original score the respondents gave. First, the original score for the performance of the better performing treatment was transformed by adding ‘1’ to each score, in order to create a scale with ‘1’ as middle score. Secondly, the score for the performance of the alternative treatment was derived by calculating the inverse of the score for the better performing treatment. Finally, the new scores were normalized, on a way that the sum of the scores for the performance of the treatment options was ‘1’. See (6) and (7) for the equations.

At the end, the perceived performance scores with regard to each attribute ($P(AP)_a$ and $P(NP)_a$) were multiplied with the weights of the attributes (W_a), see (8) and (9).This means that the performance scores for both treatment options with regard to each attribute, were weighted for the importance of the attributes related to choosing a treatment for neuropsychiatric symptoms in dementia. The sum of the resulting scores indicates the expected treatment use of both options. See (10) and (11) for the equations.

Table 4. Equations used in data analysis.

Equations
$(1)\ \boldsymbol{Frequency\ attribute\ most\ important} = \boldsymbol{F(M)_a} = \sum_{n=1}^{13} \boldsymbol{Attribute\ chosen\ as\ most\ important_n}$
$(2)\ \boldsymbol{Frequency\ attribute\ least\ important} = (\boldsymbol{F(L)_a} = \sum_{n=1}^{13} \boldsymbol{Attribute\ chosen\ as\ least\ important_n}$
$(3)\ \boldsymbol{Level\ of\ importance} = \boldsymbol{F(M)_a - F(L)_a}$
$(4)\ \boldsymbol{Square\ root\ of\ most\ important\ counts\ divided\ by\ least\ important\ counts} = \sqrt{\frac{\boldsymbol{F(M)_a + 1}}{\boldsymbol{F(L)_a + 1}}}$
$(5)\ \boldsymbol{Attribute\ importance\ weight} = \boldsymbol{W_a} = \frac{\sqrt{\frac{\boldsymbol{F(M)_a + 1}}{\boldsymbol{F(L)_a + 1}}}}{\sum_{n=1}^{13}\left(\sqrt{\frac{\boldsymbol{F(M)_a + 1}}{\boldsymbol{F(L)_a + 1}}}\right)_n}$
$(6)\ \boldsymbol{Perceived\ performance\ antipsychotic\ treatment, with\ regard\ to\ each\ attribute} = \boldsymbol{P(AP)_a} = \frac{\boldsymbol{Reciprocal\ score\ antipsychotic\ treatment}}{\boldsymbol{Reciprocal\ score\ \ antipsychotics + reciprocal\ score\ non\ pharmaceutical\ treatment}}$
$(7)\ \boldsymbol{Perceived\ performance\ non\ pharmaceutical\ treatment, with\ regard\ to\ each\ attribute} = \boldsymbol{P(NP)_a} = \frac{\boldsymbol{Reciprocal\ score\ non\ pharmaceutical\ treatment}}{\boldsymbol{Reciprocal\ score\ \ antipsychotics + reciprocal\ score\ non\ pharmaceutical\ treatment}}$
$(8)\ \boldsymbol{Perceived\ performance\ of\ antipsychotic\ treatment\ \ with\ regard\ to\ each\ attribute, weighed\ for\ attribute\ importance} = \boldsymbol{P(AP)_a * W_a}$
$(9)\ \boldsymbol{Perceived\ performance\ of non\ pharmaceutical\ treatment\ \ with\ regard\ to\ each\ \ attribute, weighed\ for\ attribute\ importance} = \boldsymbol{P(NP)_a * W_a}$
$(10)\ \boldsymbol{Expected\ \ choice\ for\ antispychotic\ treatment} = \sum_{a=1}^{13}(\boldsymbol{P(AP)_a * W_a})$
$(11)\ \boldsymbol{Expected\ \ choice\ for\ non\ pharmaceutical\ treatment} = \sum_{a=1}^{13}(\boldsymbol{P(NP)_a * W_a})$

RESULTS

From the 57 contacted elderly care physicians, 19 respondents, 5 men and 14 women, completed the questionnaire. The mean age (standard deviation (SD)) of the respondents was 49.6 years (9.9), and they had on average 10.5 years of work experience as elderly care physician (9.6). 15 respondents recently prescribed antipsychotics to dementia patients with neuropsychiatric symptoms. Only 4 respondents did not prescribe antipsychotics to these patients in the past three months. However, they prescribed antipsychotics in the past (see table 5).

Table 5. Characteristics elderly care physicians.

	n = 19
Gender	
Men (n [%])	5 [26.3]
Women (n [%])	14 [73.7]
Age in years (mean [SD])	49.6 [9.9]
Years of work experience (mean [SD])	10.5 [9.6]
Recently (in past 3 months) prescribed antipsychotics	
Yes (n [%]	15 [78.9]
No (n [%])	0 [0.0]
No, but prescribed in past (n [%])	4 [21.1]

n: Number, %: Percentage, SD: Standard deviation.

Importance of the attributes related to choosing a treatment for neuropsychiatric symptoms in dementia

The elderly care physicians considered the occurrence and severity of the neuropsychiatric symptoms as the most important attribute related to choosing a treatment for neuropsychiatric symptoms in dementia. This attribute was chosen as most important over all choice sets and all respondents for 64 times, and zero times as least important. Three other important attributes are: effectiveness, side effects and severity of the health impairments. The least important attribute related to choosing a treatment, according to elderly care physicians, is the cost, which was chosen as least important for 52 times and zero times as most important (see table 6).

Table 6. Importance of attributes related to choosing a treatment for neuropsychiatric symptoms in dementia, according to elderly care physicians, when calculated for aggregates of individual responses.

Attributes	**$F(M)_a$**	**$F(L)_a$**	**$F(M)_a$-$F(L)_a$**	**SQRT(($F(M)_a$+1)/($F(L)_a$+1))**	**W_a**
Occurrence and severity of neuropsychiatric symptoms	64	0	64	8.06	0.29
Effectiveness	46	0	46	6.86	0.25
Side effects	26	1	25	3.67	0.13
Severity of health impairments	29	2	27	3.16	0.12
Pressure by nurses to intervene	21	16	5	1.14	0.04
Required time	8	14	-6	0.77	0.03
Ease of use	14	27	-13	0.73	0.03
Ease of implementation	12	27	-15	0.68	0.02
Available time to evaluate a patient	6	15	-9	0.66	0.02
Average educational level of the nurses	9	33	-24	0.54	0.02
Average number of nurses per patient	9	35	-26	0.53	0.02
Pressure by family of the patient to intervene	3	25	-22	0.39	0.01
Costs	0	52	-52	0.14	0.01

$F(M)_a$: Frequency attribute was chosen as most important , $F(L)_a$: Frequency attribute was chosen as least important, $F(M)_a$-$F(L)_a$: The level of importance; a subtraction of the total number of times the attribute was chosen as least important from the total number of times the attributes was chosen as most important, SQRT(($F(M)_a$+1)/($F(L)_a$+1)): The square root of the ratio of most important counts plus one, divided by least important counts plus one, W_a: Attribute importance weight.

Perceived performance of treatment options with regard to the attributes

A lot of variation was found with regard to the perceived performance of the treatment options for neuropsychiatric symptoms in dementia. The elderly care physicians indicated that the non-pharmaceutical treatment performs better than the antipsychotic treatment, with regard to effectiveness and side effects. However, the antipsychotic treatment performs better with regard to the required time, ease of use, and ease of implementation, according to the elderly care physicians. The elderly care physicians regarded the performance of the treatment options as equal, when considering the costs.

Also, when the treatment options were considered for their performance in various situations, the perceived performances varied. When the performance was considered with regard to situations with severe en frequent neuropsychiatric symptoms, or when the pressure by nurses to intervene is high, the elderly care physicians indicated that the antipsychotic treatment performs better compared to the non-pharmaceutical treatment. However, in situations with severe health impairments, or restricted time to evaluate a patient, the elderly care physicians regarded the non-pharmaceutical treatment to perform better. With regard to situations with few nursing staff available, situations with a low educational level of the nurses, or when the pressure by family of the patient is high, the elderly care physicians regarded the performance of the treatment options as equal.

Besides that on average a treatment was regarded to be better compared to the other treatment, it appeared that situations exist in which a relative large group of elderly care physicians regarded the performance of the two treatment options as equal. For example the perceived performance of the treatment options with regard to a situation with restricted time to evaluate a patient. 42.1% of the respondents indicated that the non-pharmaceutical treatment performs better than the antipsychotic treatment, while only 21.1% indicated that that antipsychotic treatment has a higher performance. However, also 36.8% of the elderly care physicians regarded the performance of the treatment options as equal regarding that situation. Regarding some attributes, also the opposite happened. 42.1% of the elderly care physicians regarded the performance of the treatment options as equal with regard to situations with few nurses available. At the same time, 36.8% of the elderly care physicians indicated that the antipsychotic treatment performs better than the non-pharmaceutical treatment, while only 21.1% indicated that the non-pharmaceutical treatment performs better (see table 6).

Table 6. Performance of treatment options, according to elderly care physicians, with regard to 13 attributes.

	n = 19								
Attribute	**Antipsychotic treatment performs better (n [%])**				**Non-pharmaceutical treatment performs better (n [%])**				**Equal perceived performance (n[%])**
	Scoring 1 or 2	**Scoring 3 or 4**	**Scoring 5 or 6**	**Total**	**Scoring 1 or 2**	**Scoring 3 or 4**	**Scoring 5 or 6**	**Total**	
Highest effectiveness	3 [15.8]	2 [10.5]	0 [0.0]	5 [26.3]	1 [5.3]	5 [26.3]	7 [36.8]	13 [68.4]	1 [5.3]
Least side effects	1 [5.3]	0 [0.0]	0 [0.0]	1 [5.3]	0 [0.0]	6 [31.6]	11 [57.9]	17 [89.5]	1 [5.3]
Lowest costs	2 [10.5]	3 [15.8]	1 [5.3]	6 [31.6]	0 [0.0]	1 [5.3]	3 [15.8]	4 [21.1]	9 [47.4]

Least time necessary	4 [21.1]	6 [31.6]	1 [5.3]	11 [57.9]	0 [0.0]	0 [0.0]	3 [15.8]	3 [15.8]	5 [26.3]
Most easy to use	3 [15.8]	3 [15.8]	3 [15.8]	9 [47.4]	0 [0.0]	1 [5.3]	4 [21.1]	5 [26.3]	5 [26.3]
Most easy to implement	2 [10.5]	6 [31.6]	3 [15.8]	11 [57.9]	0 [0.0]	0 [0.0]	4 [21.1]	4 [21.1]	4 [21.1]
Severe and frequent neuropsychiatric symptoms	4 [21.1]	4 [21.1]	5 [26.3]	13 [68.4]	1 [5.3]	4 [21.1]	0 [0.0]	5 [26.3]	1 [5.3]
Severe health impairments	1 [5.3]	1 [5.3]	0 [0.0]	2 [10.5]	5 [26.3]	6 [31.6]	4 [21.1]	15 [78.9]	2 [10.5]
Restricted available time to evaluate a patient	2 [10.5]	1 [5.3]	1 [5.3]	4 [21.1]	4 [21.1]	2 [10.5]	2 [10.5]	8 [42.1]	7 [36.8]
Few nursing staff available	4 [21.1]	3 [15.8]	0 [0.0]	7 [36.8]	1 [5.3]	1 [5.3]	2 [10.5]	4 [21.1]	8 [42.1]
Low educational level of the nursing staff	5 [26.3]	1 [5.3]	0 [0.0]	6 [31.6]	1 [5.3]	3 [15.8]	2 [10.5]	6 [31.6]	7 [36.8]
High pressure by family of the patient to intervene	4 [21.1]	1 [5.3]	0 [0.0]	5 [26.3]	2 [10.5]	2 [10.5]	2 [10.5]	6 [31.6]	8 [42.1]
High pressure by nursing staff to intervene	4 [21.1]	4 [21.1]	1 [5.3]	9 [47.4]	1 [5.3]	2 [10.5]	2 [10.5]	5 [26.3]	5 [26.3]

n: Number, %: Percentage.

Expected treatment choice

As can be seen from table 7, the weighted perceived performance of the treatment options with regard to each attribute, shows that the elderly care physicians had various treatment preferences. The elderly care physicians preferred the antipsychotic treatment when considering a situation with severe and frequent neuropsychiatric symptoms. This preference was twice as strong as the preference for the non-pharmaceutical treatment. However, the preference for the non-pharmaceutical treatment was more than twice as strong as the preference for the antipsychotic treatment, when considering the effectiveness of the treatment options. Regarding side effects, the preference for the non-pharmaceutical treatment was even 12 times stronger compared to the preference for antipsychotics. Also, regarding a situation with severe health impairments, the elderly care physicians preferred the non-pharmaceutical treatment.

Overall, the summation of the treatment preferences indicates an expected choice for the non-pharmaceutical treatment for neuropsychiatric symptoms in dementia. 58% of the elderly care physicians in this study will probably choose for the non-pharmaceutical treatment, while 42% will choose for the antipsychotic treatment, when evaluating the treatment options for neuropsychiatric symptoms in dementia regarding the 13 attributes (see table 7).

Table 7. Expected treatment choice, based on the perceived performance of the treatment options with regard to each attribute and weighted for the importance of the attributes in choosing a treatment for neuropsychiatric symptoms in dementia, when calculated for aggregates of individual responses.

	W_a	$P(AP)_a$ [SD]	$P(NP)_a$ [SD]	W_a * $P(AP)_a$	W_a * $P(NP)_a$	ETC(AP)	ETC(NP)
Occurrence and severity of neuropsychiatric symptoms	0.29	0.68 [0.40]	0.32 [0.40]	0.20	0.10	0.42	0.58
Effectiveness	0.25	0.28 [0.39]	0.72 [0.39]	0.07	0.18		
Side effects	0.13	0.09 [0.20]	0.91 [0.20]	0.01	0.12		
Severity of health impairments	0.12	0.20 [0.29]	0.80 [0.29]	0.02	0.09		

Pressure by nurses to intervene	0.04	0.58 [0.37]	0.42 [0.37]	0.02	0.02
Required time	0.03	0.68 [0.35]	0.32 [0.35]	0.02	0.01
Ease of use	0.03	0.58 [0.39]	0.42 [0.39]	0.02	0.01
Ease of implementation	0.02	0.66 [0.38]	0.34 [0.38]	0.02	0.01
Available time to evaluate a patient	0.02	0.41 [0.33]	0.59 [0.33]	0.01	0.01
Average educational level of the nurses	0.02	0.48 [0.33]	0.52 [0.33]	0.01	0.01
Average number of nurses per patient	0.02	0.55 [0.32]	0.45 [0.32]	0.01	0.01
Pressure by family of the patient to intervene	0.01	0.47 [0.32]	0.53 [0.32]	0.01	0.01
Costs	0.01	0.53 [0.33]	0.47 [0.33]	0.00	0.00

W_a: Attribute importance weight, $P(AP)_a$: Normalized performance score antipsychotic treatment with regard to each attribute, $P(NP)_a$: Normalized performance score non-pharmaceutical treatment with regard to each attribute, $W_a * P(AP)_a$: Performance score antipsychotic treatment with regard to each attribute, weighted for the importance of the attributes in choosing a treatment for neuropsychiatric symptoms in dementia, $W_a * P(NP)_a$: Performance score non-pharmaceutical treatment with regard to each attribute, weighted for the importance of the attributes in choosing a treatment for neuropsychiatric symptoms in dementia, ETC(AP): Expected treatment choice for antipsychotic treatment, EP(NP): Expected treatment choice for the non-pharmaceutical treatment, SD: Standard deviation.

DISCUSSION

Importance of attributes

The first goal was of this study was to identify the importance of the attributes related to choosing a treatment for neuropsychiatric symptoms in dementia, according to elderly care physicians. The results show that patient related attributes, occurrence and severity of the neuropsychiatric symptoms and severity of the health impairments, and two treatment related attributes, effectiveness and side effects, are important in choosing a treatment for neuropsychiatric symptoms in dementia. The least important attribute is the cost associated with the treatment.

Perceived performance of treatment options

The second goal of this study was to identify the relative performance of treatment options for neuropsychiatric symptoms in dementia, according to elderly care physicians, with regard to each attribute. There is a lot of variation with regard to the perceived performance of the treatment options. The non-pharmaceutical treatment performs better than the antipsychotic treatment, regarding some attributes such as effectiveness, side effects, and situations with severe health impairments, according to elderly care physicians. However, the elderly care physicians indicated that the antipsychotic treatment performs better, when considering the performance regarding other attributes such as the required time, ease of use, ease of implementation, situations with severe en frequent neuropsychiatric symptoms, or when the pressure by nurses to intervene is high.

Explanations and solutions for the overutilization of antipsychotics in dementia

An additional goal of this study was to explain the overutilization of antipsychotics in dementia, to find possible solutions contributing to a reduction in the use of antipsychotics. Therefore, the weighted perceived performance of the treatment options with regard to each attribute was analysed. Regarding the most important attribute, the occurrence and severity of the neuropsychiatric symptoms, the weighted perceived performance indicates a preference for the antipsychotic treatment. When the treatment decision would be solely based on the evaluation op the treatment options with regard to this attribute, elderly care physicians will probably choose the antipsychotic treatment for neuropsychiatric symptoms in dementia. This is in line with the results of other studies. Sourial et al. and Aarsland et al. revealed that the number of neuropsychiatric behaviours, their mean frequency and their mean disruptiveness are all significantly associated with staff distress (4, 54). Zuidema et al. and Löveheim et al. showed that staff distress, or a high mental workload, increases antipsychotic drug use (10, 16). Nevertheless, the treatment decision is not solely based on the evaluation of the treatment options with regard to the attribute ‘occurrence and severity of the neuropsychiatric symptoms’. Also other attributes are considered when making the treatment decision, such as side effects. This study shows that physicians are aware of the side effects of antipsychotics; the elderly care physicians preferred the non-pharmaceutical treatment when considering the side effects of the treatments. Following from this, these results confirm that making a treatment choice for neuropsychiatric symptoms in dementia is difficult; because of the side effects elderly care physicians prefer the non-pharmaceutical option, but in situations with severe neuropsychiatric symptoms they prefer using antipsychotics. A quote by one of the elderly care physicians: *‘I prefer using the right approach. This means no medications. However, when the*

behavioural symptoms are very severe, that it becomes dangerous for the patient or for other patients, I have to intervene, and use antipsychotics.'

Three assumptions can be made based on the results above. The first is that elderly care physicians have sometimes no other choice than using antipsychotics when the neuropsychiatric symptoms are severe. The second is that the solution for the overutilization of antipsychotics could not be found in increasing the knowledge of elderly care physicians about side effects of antipsychotics, because the results show that elderly care physicians are aware of the side effects. The third assumption is that one possible solution for reducing the use of antipsychotics is improving the ease of use, ease of implementation and required time of non-pharmaceutical options. The elderly care physicians preferred the antipsychotic treatment with regard to ease of use, ease of implementation and required time. However, it is still not clear if improvements in the non-pharmaceutical treatment regarding these attributes, will actually contribute to a reduction of antipsychotic drug use in dementia. Other solutions could also be found in relation to not investigated factors, such as the overall knowledge about the non-pharmaceutical treatment options. More research is therefore needed to investigate if the proposed improvements can contribute to decreasing the use of antipsychotics in dementia.

Another explanation for the overutilization of antipsychotics could be found regarding the attribute pressure by nurses. Pressure by nurses ended on the fourth place in the importance ranking of the attributes related to choosing a treatment for neuropsychiatric symptoms in dementia. When considering the performance of the treatment options with regard to a situation with high pressure by nurses, the antipsychotic treatment performs better than the non-pharmaceutical treatment, according to elderly care physicians. A fourth assumption might therefore be that supporting the nurses would reduce the use of antipsychotics, by allowing them to make better use of the non-pharmaceutical treatment, and possibly ensure that they will give less pressure on the elderly care physicians to intervene. One of the elderly care physicians mentioned that supporting the staff, by training and assistance, with help from a psychologist, is essential to apply the right policies. It should be tested whether this proposal actually contributes to a reduction in the use of antipsychotics among patients with dementia.

No explanations for the overutilization of antipsychotics in dementia could be found with regard to the treatment costs. The cost is the least important attribute related to choosing a treatment. Also, elderly care physicians regarded the performance of the treatment options as equal and had no treatment preference, when considering the costs. These results show that elderly care physicians attach little value to governmental cost-reducing initiatives. This in contradiction to the results of earlier research among prescribers in the UK and in Denmark, revealing that prescribers seek to use cheaper alternatives and consider costs with the same importance as clinical effectiveness and safety (48, 55).

Final explanations for the overutilization of antipsychotics in dementia could also not be found with regard to the average number of nurses, the educational level of the nurses, the available time to evaluate a patient, or pressure by family of the patient. While researchers in earlier studies concluded that the staff/patient ratio and the educational level of the nurses are of importance, in this study, other results were found (10, 13, 42, 48, 49). The average number of nurses per patient

and their educational level are one of the least important attributes related to choosing a treatment. Furthermore, the elderly care physicians regarded the performance of the treatment options as equal and had no treatment preference with regard to these attributes. A respondent stated: *'Of course, the quantity and quality of the nursing staff is essential. I believe, however, that this should not be a reason for the direction of my treatment policy.'* Also, the elderly care physicians had no treatment preference with regard to the available time to evaluate a patient and pressure by family of the patient to intervene.

Expected treatment choice

The final goal of this study was to investigate the expected treatment choice for neuropsychiatric symptoms in dementia, according to elderly care physicians. The results show that elderly care physicians prefer to use the non-pharmaceutical treatment overall. 58% of the elderly care physicians in this study will probably choose for the non-pharmaceutical treatment for neuropsychiatric symptoms in dementia, while 42% will choose for the antipsychotic treatment, when considering the treatment options with regard to the 13 attributes. There is some consistency with results of other Dutch and international studies, showing that between 27.4% and 38% of the nursing home dementia patients with neuropsychiatric symptoms received antipsychotics (4, 11, 13-16), what means that still the majority of the patients received another (non-pharmaceutical) treatment or no treatment. Nevertheless, if the expected treatment choice for antipsychotics as shown in this study will be 42% in practice, one can still speak about overutilization.

Limitations

Besides that this is the first study revealing the expected treatment choices for neuropsychiatric symptoms in dementia, based on a comprehensive evaluation of the importance of the attributes influencing the elderly care physicians' treatment decisions and a perceived performance measurement of the treatment options, this study has some limitations. First of all, caution is needed when interpreting the importance ranking of the attributes between the most and least important attribute. Besides that BWS is a better method to create consistency in the answering pattern of the respondents than simple ranking and rating, there was still some inconsistency. The importance ranking based on the root of the most important counts plus one divided by the least important counts plus one, differs sometimes from the ranking based on the level of importance ($F(M)_a$-$F(L)_a$). However, top and bottom attributes in the ranking do not vary between these rankings, and the overall ranking has only minimal deviations.

A second limitation could be that the importance ranking was based on aggregates of individual responses, instead of using individual rankings in which the average ranking would be calculated later on. It is possible that the final conclusions would be different when using the ranking based on individual responses. For that reason, the importance ranking was also calculated for individual responses (see appendix D). The correlation between the ranking based on aggregates of individual responses and the ranking based on individual responses is very high; 0.96. Besides, some deviations were found between the rankings. The difference between the importance weights for the most important attribute and least important attribute is much smaller in the ranking based on individual responses compared to the ranking based on aggregates of individual responses. This resulted into less extreme treatment preferences with regard to each attribute (see appendix E).

Also, the overall expected treatment choice revealed a smaller preference, with 0.53 for the non-pharmaceutical treatment, and 0.47 for the antipsychotic treatment. However, still the same treatment was preferred, so the choice to use aggregates of individual responses did not strongly affect the final results.

The final limitation can be found in the reliability and generalizability of the results. In total 19 out of 57 contacted elderly care physicians completed the questionnaire. This limited questionnaire response could negatively influence the reliability of the results. Furthermore, because the study was performed under elderly care physicians employed in the eastern of The Netherlands, the results might not be representative for all other physicians.

CONCLUSION

Despite the limitations in this study, it is possible to draw some conclusions. The results in this study clearly demonstrate that elderly care physicians attach most value to attributes related to the patient, and the effectiveness and side effects of the treatment, when choosing a treatment for neuropsychiatric symptoms in dementia. Secondly, the results show there is much variation in the perceived performance of the treatment options; the antipsychotic treatment and the non-pharmaceutical treatment. Thirdly, when considering the treatment options with regard to all 13 attributes, elderly care physicians prefer to use the non-pharmaceutical treatment (58% of the elderly care physicians in this study will probably choose for the non-pharmaceutical treatment while 42% will choose for the antipsychotic treatment). However, in situations with severe and frequent neuropsychiatric symptoms, they strongly prefer the antipsychotic treatment. At the same time, one can still speak about overutilization, if an overall preference for antipsychotics in 42% of the cases will actually lead to real prescriptions.

The results in this study are valuable, because this is the first study that analysed the direct opinion of the elderly care physicians about the importance of the attributes related to choosing a treatment for neuropsychiatric symptoms in dementia, on a quantitative way. In addition, this study directly combined accurate information about the perceived importance of the attributes with the perceived performance of the treatment options. The results revealed stated preferences of elderly care physicians, giving more insight into the decision making process. Finally, assumptions are made with regard to possible solutions for the overutilization of antipsychotics in dementia. The first possible solution is improving the ease of use, ease of implementation and required time of non-pharmaceutical options. A second possible solution is supporting the nurses by allowing them to make better use of the non-pharmaceutical treatment. However, it is still not clear if the suggested solutions will actually contribute to a reduction of antipsychotic drug use in dementia. More research is therefore needed to investigate if the proposed improvements can contribute to decreasing the use of antipsychotics in dementia.

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APPENDIX A: Results literature research into the factors

Most treatment decisions are multifactorial; these decisions are not only related to medical evaluation, but also other factors such as patient factors are important (56). Overall, these factors could be can be broken down into four main categories; treatment related factors, patient factors, nursing home indicators for staff distress and workload, and physician factors.

Treatment related factors, *clinical effectiveness* and *side effects* of the treatment, seem to be highly influential on prescribing decisions of physicians (42-44). When physicians expect that the effectiveness of antipsychotics is relatively high compared to the effectiveness of the non-pharmaceutical alternatives, this will probably, depending on the expectations of the side effects of the antipsychotics, increase the use of antipsychotics. A lack of evidence base of the alternatives was seen as barrier to use non-pharmaceutical interventions (57). *Costs* are also of importance in the treatment decision (43, 45, 56, 58). Because of governmental cost-reducing initiatives, prescribers seek to use cheaper alternatives (55). In a study among GPs in Denmark it was revealed that many participants considered costs with the same importance as clinical effectiveness and safety (48). However, in a study by the Department of Health it was revealed that prescribers believe that costs should be taken into account, but always secondary to clinical efficacy and safety. They will not prescribe a drug, for example, that they feel lacks efficacy or will compromise on patient's safety, just because it is cheaper (42). Furthermore, the *necessary time* associated with the treatment is a factor that could influence the treatment decision. Wood-Mitchell et al. revealed that elderly care physicians often think that non-pharmaceutical interventions are time consuming, what prevents the use of these treatments (57). Lastly, *ease of use* and *ease of implementation* are of importance in the decision (58). According to the research by Wood-Mitchell et al., physicians expect difficulties in implementation of non-pharmaceutical interventions, especially because more resources are needed, such as interdisciplinary teams, higher qualified staff, and changes of the nursing home environment (57). Antipsychotic drug use will probably increase when physicians expect the antipsychotic drug treatment to be less time consuming and easier to use and implement compared to the non-pharmaceutical treatment.

Van der Spek et al. included patient factors in a conceptual framework on psychotropic drug use in nursing homes. Some patient factors are related to *the severity of the health impairments* of the patient, such as the number of falls and the use of activities (46). Also the number of medications, the number of diseases, and Activities of Daily Living (ADL) provide an indication of the severity of the health of the patient. For example, in a cross-sectional study among nursing homes in Slovenia, it was revealed that the number of all drugs regularly taken by the patient, was positively associated with antipsychotic drug use (47). Regarding ADL; in a cross-sectional study among geriatric care units Sweden, which included 2017 residents, it was revealed that residents who used antipsychotics were more ADL dependent (16). Furthermore, Van der Spek et al. expect that the *occurrence and severity of neuropsychiatric symptoms* are associated with the prescribing behaviour of psychotropic drugs (46). The relation between the presence of neuropsychiatric symptoms and the use of antipsychotics has been investigated extensively in the past. Agitation/aggression (10, 11, 14, 16, 49), depressive symptoms (13, 15, 16), psychosis, night time behaviour (14), hallucinatory symptoms, verbally disruptive and wandering behaviour (16), passiveness, and mild cognitive impairment (11) are all positively associated with antipsychotic drug use. It was also proven that the

number of neuropsychiatric behaviours, their mean frequency and their mean disruptiveness are all significantly associated with staff distress (4, 54). In a cross-sectional study in public long term care services in Japan, it was revealed that behavioural and psychological symptoms of dementia were significantly associated with a heavy caregiver's burden. A heavy caregiver's burden led to depressive symptoms (59). Also, Liperoti et al. and Jeste et al. presumed the association between neuropsychiatric symptoms and caregiver's stress and depression (3, 17). Staff distress, or a high mental workload, is one of the factors that is related to antipsychotic drug use (10, 16).

In addition, there are other causes that underlie staff distress; nursing home indicators related to staff distress and work pressure. For example, when the *staff/patient ratio* per nursing unit is low, physicians can feel work pressure. This work pressure could increase antipsychotic drug prescriptions; busier practices tend to prescribe more (42, 48). In the past it was revealed that a low level of nursing staff is associated with an increased use of psychotropic drugs (13). Furthermore, a poor nurse-to-patient ratio was seen as barrier to use non-pharmacological interventions (49). However, Zuidema et al. disagreed this conclusion; they did not find a significant association between the staff/patient ratio and antipsychotic drug use (10). Next to the quantity of the nurses, the quality of *the nurses*, in terms of their *educational level*, is of importance in the decision. A lack of good qualified nursing staff could result in staff distress, because physicians are not able to practice all possible treatment options. To apply some treatments, one needs higher qualified staff with expert knowledge. A lack of qualified staff was found as barrier to use non-pharmaceutical interventions (49). Another factor that could result in staff distress, is the perceived *pressure to intervene* in response to a difficult situation, when not having a ready solution for that situation (55). In qualitative research among caregivers in Dutch nursing homes it was revealed that, in some cases, physicians feel pressure to prescribe antipsychotics *by nursing staff* or *by the family* of the patient (49). For example in case of emergencies, especially in night or weekend shifts. These emergencies could result staff distress among the nurses, and forces them to ask for prescribing medicines (79).

Finally, a physician factor, the *time* they have *to evaluate a patient* could influence the treatment decision (45). Competing demands on the time of physicians and GP's were viewed as a potential threat to the quality of prescribing decisions (55). Time constraints were also cited as reasons for not translating good intentions into meaningful action, because of insufficient time to keep professionally up to date (42, 45, 48, 55).

Table 8. List of factors that will be analysed.

Main group	Factors
Treatment related factors	Effectiveness
	Side effects
	Costs
	Required time
	Ease of use
	Ease of implementation
Patient factors	Occurrence and severity of neuropsychiatric symptoms
	Severity of health impairments
Physician factors	Available time to evaluate a patient
Nursing home indicators for straff distress and workload	Average number of nurses per patient
	Average educational level of the nurses
	Pressure by family of the patient to intervene
	Pressure by nurses to intervene

APPENDIX B: Methods for measuring the importance of a number of factors

There are many ways to measure the importance of a number of factors. Most common methods are questionnaires with ratings or rankings. The advantage of using ratings, with line scales, is that this method is relative easy to complete and less time consuming for respondents. Another advantage is that the results are easy to analyse. Finally, this method can handle a large number of factors (60). A disadvantage of this method is, however, that it can be challenging to ensure that individuals use the same scale, because many different response styles can be found. The distance between the successive intervals may thus vary individually (61). This can result in scale using bias. Also, when using rating scales, this will often lead to a situation that individuals rate all the factors as important with minimal differences in the mean ratings (60, 62). This is because respondents were not asked to make trade-offs between the different factors, what results in less discrimination between response categories (63). The constant sum approach, overcomes this problem, because this method forces trade-offs (62). With this method, respondents divide a constant sum (e.g. 100 points) over the various factors. However, when the number of factors to rank is large (ten or more), it becomes difficult for the respondents to divide a constant sum among all the factors (60). This is also the case with the ranking method; when respondents have to rank a large number of factors, it is easy to rank the most and least important factor, but in between these extremes ranking becomes difficult. Another method that forces to make trade-offs, is the method with paired comparisons, such as Analytical Hierarchy Process (AHP). It is easy to compare two factors and to indicate which one is more important. However, also this method encounters problems; especially when the number of factors is large, this approach requires a large number of choice questions to estimate preferences for objects (52).

A method that overcomes these difficulties is the Best Worst Scaling (BWS) method (case 1). This is a method for measuring the degree of importance or degree of interest of some set of objects, and was introduced by Finn and Louviere in 1992 (50). BWS is built on the idea that when individuals evaluate a set of three or more factors on a subjective scale, their choices of the top and bottom factors should be more reliable that choices of middle factors. It assumes that respondents make valid and reliable choices of two most extremes factors in a set. For that reason, respondents are provided choice sets and choose the most important and least important form each set. A simple count and manipulation results in a single preference scale, where the differences may be compared as distances rather than rank order (51).

A strength of this method is that BWS requires respondents to make trade-offs among factors. This prevents that respondents indicate that all factors are important or not important, and 'forces' the relative importance out of the respondent (52). Furthermore, since there is only one factor to choose that is 'most' or 'least' important, BWS has no bias in the rating scale (51). Another strength is that BWS is relatively easy to implement and analyse which makes the method accessible to many researchers (52). Also, respondents find BWS easy and quick to complete (51). Finally, BWS can handle much more factors compared to the ranking method, and uses an ordinal scale which gives insight in the strength of importance rather than just the order of importance.

APPENDIX C: The online questionnaire (in Dutch)

Figure 1. Welcome message.

Onderzoek naar de voorkeuren bij de behandeling van neuropsychiatrische symptomen bij dementerenden

Vragenlijst naar de voorkeuren bij de behandeling van neuropsychiatrische symptomen bij dementerenden in verpleeg- en verzorgingshuizen.

Wij vragen graag uw medewerking bij het onderzoek naar de voorkeuren bij de behandeling van neuropsychiatrische symptomen bij dementerenden in verpleeg- en verzorgingshuizen. Het invullen van deze vragenlijst zal ongeveer **15 minuten** in beslag nemen. Uw gegevens zullen geheel anoniem worden verwerkt.

Voor vragen over de vragenlijst kunt u contact op nemen via de e-mail op S.I.M.Janus@utwente.nl of telefonisch op nummer 0626617977. Aan het einde van de vragenlijst heeft u tevens de mogelijkheid om op- of aanmerkingen achter te laten.

Om u door de vragenlijst te verplaatsen, dient u de volgende navigatieknoppen te gebruiken:

- Klik op de knop Volgende om naar de volgende pagina te gaan.
- Klik op de knop Vorige om naar de vorige pagina te gaan.
- Klik op de knop Hervat later als u de vragenlijst later wil hervatten.
- Klik op de knop Versturen als u de vragenlijst wilt indienen.

Namens het onderzoeksteam,

Sarah Janus
Hoofdonderzoeker

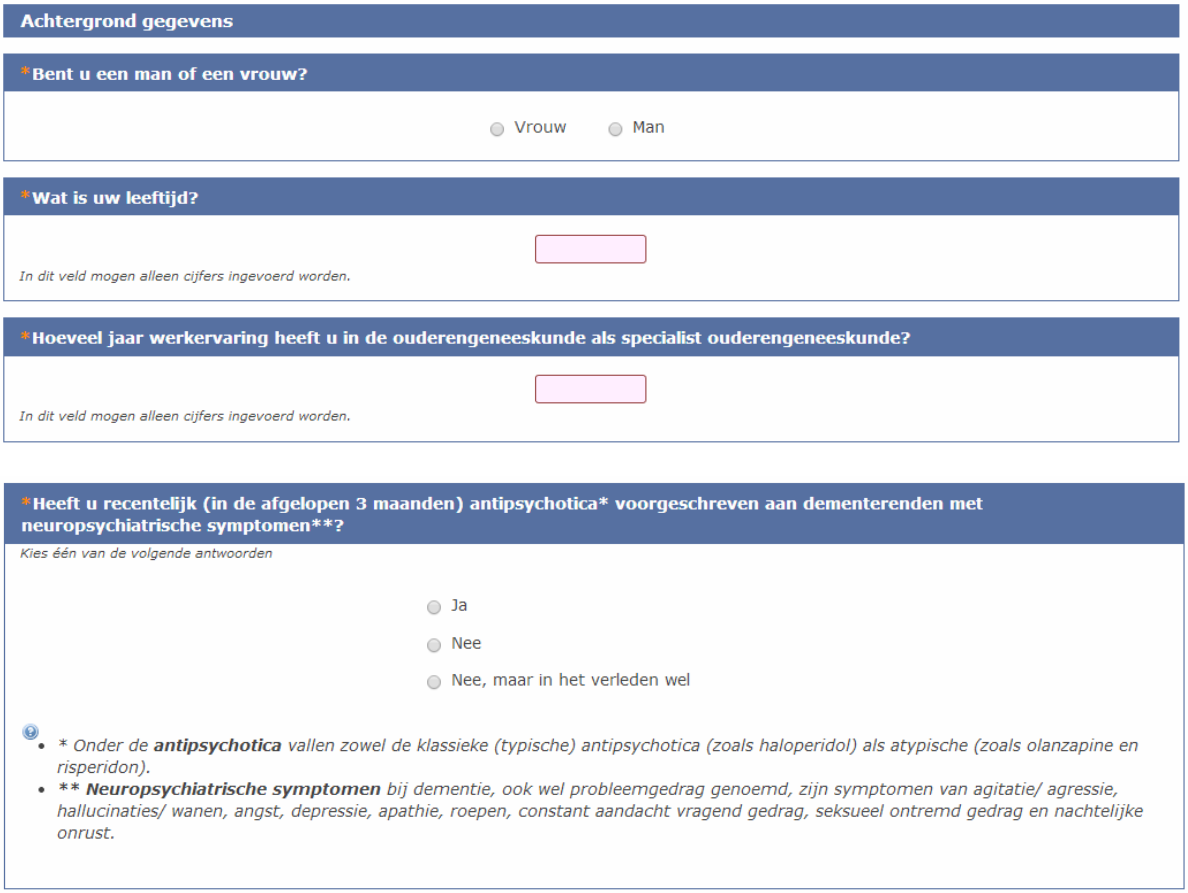
Er zijn 20 vragen in deze enquête.

Een opmerking over uw privacy
Deze enquête is anoniem.
De bewaarde gegevens bevatten geen identiteitsgegevens tenzij u deze bij een vraag hebt ingevuld. Indien u via een toegangscode deelneemt kunnen wij u verzekeren dat deze niet wordt bewaard in combinatie met uw respons maar wel is opgeslagen in een aparte tabel. De tabel met toegangscodes wordt gebruikt om na te kijken of een enquête reeds voor de betreffende toegangscode is ingevuld. Er is geen enkele manier om de codes te koppelen aan uw respons.

Volgende

Laad onvoltooide enquête | Stoppen, verwijder alle ingevulde antwoorden

Figure 2. Questions about background information.



Achtergrond gegevens

***Bent u een man of een vrouw?**

Vrouw Man

***Wat is uw leeftijd?**

In dit veld mogen alleen cijfers ingevoerd worden.

***Hoeveel jaar werkervaring heeft u in de ouderengeneeskunde als specialist ouderengeneeskunde?**

In dit veld mogen alleen cijfers ingevoerd worden.

***Heeft u recentelijk (in de afgelopen 3 maanden) antipsychotica* voorgeschreven aan dementerenden met neuropsychiatrische symptomen**?**

Kies één van de volgende antwoorden

Ja
Nee
Nee, maar in het verleden wel

- ** Onder de **antipsychotica** vallen zowel de klassieke (typische) antipsychotica (zoals haloperidol) als atypische (zoals olanzapine en risperidon).*
- *** **Neuropsychiatrische symptomen** bij dementie, ook wel probleemgedrag genoemd, zijn symptomen van agitatie/ agressie, hallucinaties/ wanen, angst, depressie, apathie, roepen, constant aandacht vragend gedrag, seksueel ontremd gedrag en nachtelijke onrust.*

Figure 3. Best worst scaling questions.

Voorkeuren bij de behandeling van neuropsychiatrische symptomen

Nu zullen 13 vragen volgen die betrekking hebben op uw voorkeuren bij de keuze voor de behandeling van neuropsychiatrische symptomen* bij dementie patiënten. Denk hierbij aan de keuze tussen twee behandelingen; de farmaceutische behandeling met antipsychotica** of de niet-farmaceutische behandeling***.

U zult een per vraag een aantal factoren te zien krijgen, waarvan u moet aangeven welke factor het meest en welke factor het minst belangrijk is bij de keuze voor de behandeling. Per vraag zijn slechts twee antwoorden mogelijk, respectievelijk de factor die voor u het meest belangrijk is en de factor die het minst belangrijk is voor u. Tevens mogen de twee antwoorden niet op dezelfde factor slaan.

Toelichting:

- * ***Neuropsychiatrische symptomen*** *bij dementie, ook wel probleemgedrag genoemd, zijn symptomen van agitatie/ agressie, hallucinaties/ wanen, angst, depressie, apathie, roepen, constant aandacht vragend gedrag, seksueel ontremd gedrag en nachtelijke onrust.*
- ** *Bij* ***antipsychotica*** *gaat het zowel om klassieke (typische) antipsychotica (zoals haloperidol) als om atypische (zoals olanzapine en risperidon).*
- *** *De* ***niet-farmaceutische behandeling,*** *psychosociale begeleiding en behandeling, omvat de afspraken en interventies gericht op de patiënt of zijn omgeving. Voorbeelden van de niet-farmaceutische behandeling zijn: standaard therapie zoals gedragstherapie, therapie om herinneringen op te halen en cognitieve stimulatie, interventies gericht op zintuigactivering zoals snoezelen (mulit-sensory activation), aromatherapie, muziektherapie en lichttherapie, activiteiten zoals schilderen en puzzelen, bewegingstherapie zoals dansen en sport, psychosociale therapie, psycho-educatie voor mantelzorgers en interventies gericht op de omgeving van de patiënt zoals het creëren van een huiselijke omgeving en het aanleggen van een loopcircuit of snoezelruimte.*

***Welke factor is voor u het meest en welke factor u voor u het minst belangrijk bij de keuze voor de behandeling van neuropsychiatrische symptomen bij dementie patiënten?**

Dit is een verplichte vraag. Vul alle onderdelen in.

Meest belangrijk		Minst belangrijk
○	Gemiddeld opleidingsniveau van de verpleegkundigen	○
○	Ernst van de gezondheidstoestand	○
○	Eenvoud van toepassing	○
○	Bijwerkingen	○

- ***Gemiddeld opleidingsniveau van de verpleegkundigen*** *is het gemiddelde opleidingsniveau de verpleegkundigen op de afdeling waar de patiënt wordt behandeld.*
- ***Ernst van de gezondheidstoestand*** *heeft betrekking op co-morbiditeit, het aantal medicaties dat de patiënt slikt en de mate waarin de patiënt zelfstandig is (Activiteiten Dagelijkse Levensverrichtingen [ADL]).*
- ***Eenvoud van toepassing*** *is de mate waarin de dagelijkse toepassing van de behandeling om inspanningen vraagt van (verpleegkundig) personeel en/of (familie van) de patiënt.*
- ***Bijwerkingen*** *zijn ongewenste effecten van de behandeling die vaak schadelijk zijn voor de patiënt.*

*** Welke factor is voor u het meest en welke factor u voor u het minst belangrijk bij de keuze voor de behandeling van neuropsychiatrische symptomen bij dementie patiënten?**

Dit is een verplichte vraag. Vul alle onderdelen in.

Meest belangrijk		Minst belangrijk
○	Ernst en frequentie van neuropsychiatrische symptomen	○
○	Effectiviteit	○
○	Eenvoud van implementatie	○
○	Eenvoud van toepassing	○

- ***Ernst en frequentie van neuropsychiatrische symptomen*** *is de mate waarin neuropsychiatrische symptomen voorkomen en de ernst van deze symptomen. Neuropsychiatrische symptomen van dementie zijn agitatie/ agressie, psychose, depressie en apathie*
- ***Effectiviteit*** *is de mate waarin de neuropsychiatrische symptomen verbeteren als gevolg van de behandeling.*
- ***Eenvoud van implementatie*** *is de mate waarin de implementatie van de behandeling om inspanningen vraagt van medische teams, er meer en hoger opgeleid (verpleegkundig) personeel voor nodig is en er aanpassingen van het verpleeghuis voor nodig zijn.*
- ***Eenvoud van toepassing*** *is de mate waarin de dagelijkse toepassing van de behandeling om inspanningen vraagt van (verpleegkundig) personeel en/of (familie van) de patiënt.*

*
Welke factor is voor u het meest en welke factor u voor u het minst belangrijk bij de keuze voor de behandeling van neuropsychiatrische symptomen bij dementie patiënten?

Dit is een verplichte vraag. Vul alle onderdelen in.

Meest belangrijk		Minst belangrijk
○	Druk van familie om snel in te grijpen	○
○	Eenvoud van toepassing	○
○	Benodigde tijd	○
○	Gemiddeld aantal verpleegkundigen per patiënt	○

- ***Druk van familie om snel in te grijpen*** *komt voor wanneer familie van de patiënt het belang uitspreekt van en druk uitoefent om snel in te grijpen*
- ***Eenvoud van toepassing*** *is de mate waarin de dagelijkse toepassing van de behandeling om inspanningen vraagt van (verpleegkundig) personeel en/of (familie van) de patiënt.*
- *De* ***benodigde tijd*** *is de tijd die nodig is voor het toepassen van de behandeling (o.a. uitvoeren behandeling, controle en nazorg).*
- ***Gemiddeld aantal verpleegkundigen per patiënt*** *is het gemiddelde aantal verpleegkundigen per patiënt op de afdeling waar de patiënt wordt behandeld.*

*
Welke factor is voor u het meest en welke factor u voor u het minst belangrijk bij de keuze voor de behandeling van neuropsychiatrische symptomen bij dementie patiënten?

Dit is een verplichte vraag. Vul alle onderdelen in.

Meest belangrijk		Minst belangrijk
○	Eenvoud van toepassing	○
○	Druk van verpleegkundigen om snel in te grijpen	○
○	Beschikbare tijd om de patiënt te evalueren	○
○	Kosten	○

- ***Eenvoud van toepassing*** *is de mate waarin de dagelijkse toepassing van de behandeling om inspanningen vraagt van (verpleegkundig) personeel en/of (familie van) de patiënt*
- ***Druk van verpleegkundigen om snel in te grijpen*** *komt voor wanneer verpleegkundigen het belang uitspreken van en druk uitoefenen om snel in te grijpen, bijvoorbeeld als gevolg van noodgevallen op een afdeling.*
- *De* ***beschikbare tijd om de patiënt te evalueren*** *is de tijd die is de tijd die u beschikbaar heeft om de patiënt te evalueren en het juiste behandelplan op te stellen afgestemd op de patiënt (o.a. medische historie, co-morbiditeit en risicofactoren bekijken).*
- ***Kosten*** *zijn de directe en indirecte kosten die gepaard gaan met de behandeling. Directe kosten zijn de prijs van het product of de dienst. Indirecte kosten zijn de kosten voor scholing van het (verpleegkundig) personeel, aanpassingen van de omgeving en eventuele kosten voor familie van de patiënt.*

***Welke factor is voor u het meest en welke factor u voor u het minst belangrijk bij de keuze voor de behandeling van neuropsychiatrische symptomen bij dementie patiënten?**

Dit is een verplichte vraag. Vul alle onderdelen in.

Meest belangrijk		Minst belangrijk
○	Benodigde tijd	○
○	Kosten	○
○	Bijwerkingen	○
○	Effectiviteit	○

- *De* ***benodigde tijd*** *is de tijd die nodig is voor het toepassen van de behandeling (o.a. uitvoeren behandeling, controle en nazorg).*
- ***Kosten*** *zijn de directe en indirecte kosten die gepaard gaan met de behandeling. Directe kosten zijn de prijs van het product of de dienst. Indirecte kosten zijn de kosten voor scholing van het (verpleegkundig) personeel, aanpassingen van de omgeving en eventuele kosten voor familie van de patiënt.*
- ***Bijwerkingen*** *zijn ongewenste effecten van de behandeling die vaak schadelijk zijn voor de patiënt.*
- ***Effectiviteit*** *is de mate waarin de neuropsychiatrische symptomen verbeteren als gevolg van de behandeling.*

***Welke factor is voor u het meest en welke factor u voor u het minst belangrijk bij de keuze voor de behandeling van neuropsychiatrische symptomen bij dementie patiënten?**

Dit is een verplichte vraag. Vul alle onderdelen in.

Meest belangrijk		Minst belangrijk
○	Druk van verpleegkundigen om snel in te grijpen	○
○	Bijwerkingen	○
○	Gemiddeld aantal verpleegkundigen per patiënt	○
○	Ernst en frequentie van neuropsychiatrische symptomen	○

- ***Druk van verpleegkundigen om snel in te grijpen*** *komt voor wanneer verpleegkundigen het belang uitspreken van en druk uitoefenen om snel in te grijpen, bijvoorbeeld als gevolg van noodgevallen op een afdeling.*
- ***Bijwerkingen*** *zijn ongewenste effecten van de behandeling die vaak schadelijk zijn voor de patiënt.*
- ***Gemiddeld aantal verpleegkundigen per patiënt*** *is het gemiddelde aantal verpleegkundigen per patiënt op de afdeling waar de patiënt wordt behandeld.*
- ***Ernst en frequentie van neuropsychiatrische symptomen*** *is de mate waarin neuropsychiatrische symptomen voorkomen en de ernst van deze symptomen. Neuropsychiatrische symptomen van dementie zijn agitatie/ agressie, psychose, depressie en apathie.*

***Welke factor is voor u het meest en welke factor u voor u het minst belangrijk bij de keuze voor de behandeling van neuropsychiatrische symptomen bij dementie patiënten?**

Dit is een verplichte vraag. Vul alle onderdelen in.

Meest belangrijk		Minst belangrijk
○	Bijwerkingen	○
○	Eenvoud van toepassing	○
○	Druk van familie om snel in te grijpen	○
○	Beschikbare tijd om de patiënt te evalueren	○

- ***Bijwerkingen*** *zijn ongewenste effecten van de behandeling die vaak schadelijk zijn voor de patiënt.*
- ***Eenvoud van implementatie*** *is de mate waarin de implementatie van de behandeling om inspanningen vraagt van medische teams, er meer en hoger opgeleid (verpleegkundig) personeel voor nodig is en er aanpassingen van het verpleeghuis voor nodig zijn.*
- ***Druk van familie om om snel in te grijpen*** *komt voor wanneer familie van de patiënt het belang uitspreekt van en druk uitoefent om snel in te grijpen.*
- *De* ***beschikbare tijd om de patiënt te evalueren*** *is de tijd die u beschikbaar heeft om de patiënt te evalueren en het juiste behandelplan op te stellen afgestemd op de patiënt (o.a. medische historie, co-morbiditeit en risicofactoren bekijken).*

***Welke factor is voor u het meest en welke factor u voor u het minst belangrijk bij de keuze voor de behandeling van neuropsychiatrische symptomen bij dementie patiënten?**

Dit is een verplichte vraag. Vul alle onderdelen in.

Meest belangrijk		Minst belangrijk
○	Effectiviteit	○
○	Druk van familie om snel in te grijpen	○
○	Gemiddeld opleidingsniveau van de verpleegkundigen	○
○	Druk van verpleegkundigen om snel in te grijpen	○

- ***Effectiviteit*** *is de mate waarin de neuropsychiatrische symptomen verbeteren als gevolg van de behandeling.*
- ***Druk van familie om snel in te grijpen*** *komt voor wanneer familie van de patiënt het belang uitspreekt van en druk uitoefent om snel in te grijpen.*
- ***Gemiddeld opleidingsniveau van de verpleegkundigen*** *is het gemiddelde opleidingsniveau de verpleegkundigen op de afdeling waar de patiënt wordt behandeld.*
- ***Druk van verpleegkundigen om snel in te grijpen*** *komt voor wanneer verpleegkundigen het belang uitspreken van en druk uitoefenen om snel in te grijpen, bijvoorbeeld als gevolg van noodgevallen op een afdeling.*

***Welke factor is voor u het meest en welke factor u voor u het minst belangrijk bij de keuze voor de behandeling van neuropsychiatrische symptomen bij dementie patiënten?**

Dit is een verplichte vraag. Vul alle onderdelen in.

Meest belangrijk		Minst belangrijk
○	Beschikbare tijd om de patiënt te evalueren	○
○	Gemiddeld opleidingsniveau van de verpleegkundigen	○
○	Ernst en frequentie van neuropsychiatrische symptomen	○
○	Benodigde tijd	○

- De ***beschikbare tijd om de patiënt te evalueren*** *is de tijd die u beschikbaar heeft om de patiënt te evalueren en het juiste behandelplan op te stellen afgestemd op de patiënt (o.a. medische historie, co-morbiditeit en risicofactoren bekijken).*
- ***Gemiddeld opleidingsniveau van de verpleegkundigen*** *is het gemiddelde opleidingsniveau de verpleegkundigen op de afdeling waar de patiënt wordt behandeld.*
- ***Ernst en frequentie van neuropsychiatrische symptomen*** *is de mate waarin neuropsychiatrische symptomen voorkomen en de ernst van deze symptomen. Neuropsychiatrische symptomen van dementie zijn agitatie/ agressie, psychose, depressie en apathie.*
- *De* ***benodigde tijd*** *is de tijd die nodig is voor het toepassen van de behandeling (o.a. uitvoeren behandeling, controle en nazorg).*

***Welke factor is voor u het meest en welke factor u voor u het minst belangrijk bij de keuze voor de behandeling van neuropsychiatrische symptomen bij dementie patiënten?**

Dit is een verplichte vraag. Vul alle onderdelen in.

Meest belangrijk		Minst belangrijk
○	Eenvoud van implementatie	○
○	Gemiddeld aantal verpleegkundigen per patiënt	○
○	Kosten	○
○	Gemiddeld opleidingsniveau van de verpleegkundigen	○

- ***Eenvoud van van implementatie*** *is de mate waarin de implementatie van de behandeling om inspanningen vraagt van medische teams, er meer en hoger opgeleid (verpleegkundig) personeel voor nodig is en er aanpassingen van het verpleeghuis voor nodig zijn.*
- ***Gemiddeld aantal verpleegkundigen per patiënt*** *is het gemiddelde aantal verpleegkundigen per patiënt op de afdeling waar de patiënt wordt behandeld.*
- ***Kosten*** *zijn de directe en indirecte kosten die gepaard gaan met de behandeling. Directe kosten zijn de prijs van het product of de dienst. Indirecte kosten zijn de kosten voor scholing van het (verpleegkundig) personeel, aanpassingen van de omgeving en eventuele kosten voor familie van de patiënt.*
- ***Gemiddeld opleidingsniveau van de verpleegkundigen*** *is het gemiddelde opleidingsniveau de verpleegkundigen op de afdeling waar de patiënt wordt behandeld.*

***Welke factor is voor u het meest en welke factor u voor u het minst belangrijk bij de keuze voor de behandeling van neuropsychiatrische symptomen bij dementie patiënten?**

Dit is een verplichte vraag. Vul alle onderdelen in.

Meest belangrijk		Minst belangrijk
○	Gemiddeld aantal verpleegkundigen per patiënt	○
○	Beschikbare tijd om de patiënt te evalueren	○
○	Effectiviteit	○
○	Ernst van de gezondheidstoestand	○

- ***Gemiddeld aantal verpleegkundigen per patiënt*** *is het gemiddelde aantal verpleegkundigen per patiënt op de afdeling waar de patiënt wordt behandeld.*
- *De* ***beschikbare tijd om de patiënt te evalueren*** *is de tijd die u beschikbaar heeft om de patiënt te evalueren en het juiste behandelplan op te stellen afgestemd op de patiënt (o.a. medische historie, co-morbiditeit en risicofactoren bekijken).*
- ***Effectiviteit*** *is de mate waarin de neuropsychiatrische symptomen verbeteren als gevolg van de behandeling.*
- ***Ernst van de gezondheidstoestand*** *heeft betrekking op co-morbiditeit, het aantal medicaties dat de patiënt slikt en de mate waarin de patiënt zelfstandig is (Activiteiten Dagelijkse Levensverrichtingen [ADL]).*

***Welke factor is voor u het meest en welke factor u voor u het minst belangrijk bij de keuze voor de behandeling van neuropsychiatrische symptomen bij dementie patiënten?**

Dit is een verplichte vraag. Vul alle onderdelen in.

Meest belangrijk		Minst belangrijk
○	Kosten	○
○	Ernst en frequentie van neuropsychiatrische symptomen	○
○	Ernst van de gezondheidstoestand	○
○	Druk van familie om snel in te grijpen	○

- ***Kosten*** *zijn de directe en indirecte kosten die gepaard gaan met de behandeling. Directe kosten zijn de prijs van het product of de dienst. Indirecte kosten zijn de kosten voor scholing van het (verpleegkundig) personeel, aanpassingen van de omgeving en eventuele kosten voor familie van de patiënt.*
- ***Ernst en frequentie van neuropsychiatrische symptomen*** *is de mate waarin neuropsychiatrische symptomen voorkomen en de ernst van deze symptomen. Neuropsychiatrische symptomen van dementie zijn agitatie/ agressie, psychose, depressie en apathie.*
- ***Ernst van de gezondheidstoestand*** *heeft betrekking op co-morbiditeit, het aantal medicaties dat de patiënt slikt en de mate waarin de patiënt zelfstandig is (Activiteiten Dagelijkse Levensverrichtingen [ADL]).*
- ***Druk van familie om snel in te grijpen*** *komt voor wanneer familie van de patiënt het belang uitspreekt van en druk uitoefent om snel in te grijpen.*

***Welke factor is voor u het meest en welke factor u voor u het minst belangrijk bij de keuze voor de behandeling van neuropsychiatrische symptomen bij dementie patiënten?**

Dit is een verplichte vraag. Vul alle onderdelen in.

Meest belangrijk		Minst belangrijk
○	Ernst van de gezondheidstoestand	○
○	Benodigde tijd	○
○	Druk van verpleegkundigen om snel in te grijpen	○
○	Eenvoud van implementatie	○

- ***Ernst van de gezondheidstoestand*** *heeft betrekking op co-morbiditeit, het aantal medicaties dat de patiënt slikt en de mate waarin de patiënt zelfstandig is (Activiteiten Dagelijkse Levensverrichtingen [ADL]).*
- *De* ***benodigde tijd*** *is de tijd die nodig is voor het toepassen van de behandeling (o.a. uitvoeren behandeling, controle en nazorg).*
- ***Druk van verpleegkundigen om snel in te grijpen*** *komt voor wanneer verpleegkundigen het belang uitspreken van en druk uitoefenen om snel in te grijpen, bijvoorbeeld als gevolg van noodgevallen op een afdeling.*
- ***Eenvoud van van implementatie*** *is de mate waarin de implementatie van de behandeling om inspanningen vraagt van medische teams, er meer en hoger opgeleid (verpleegkundig) personeel voor nodig is en er aanpassingen van het verpleeghuis voor nodig zijn.*

Figure 4. Perceived performance questions with regard to treatment goals.

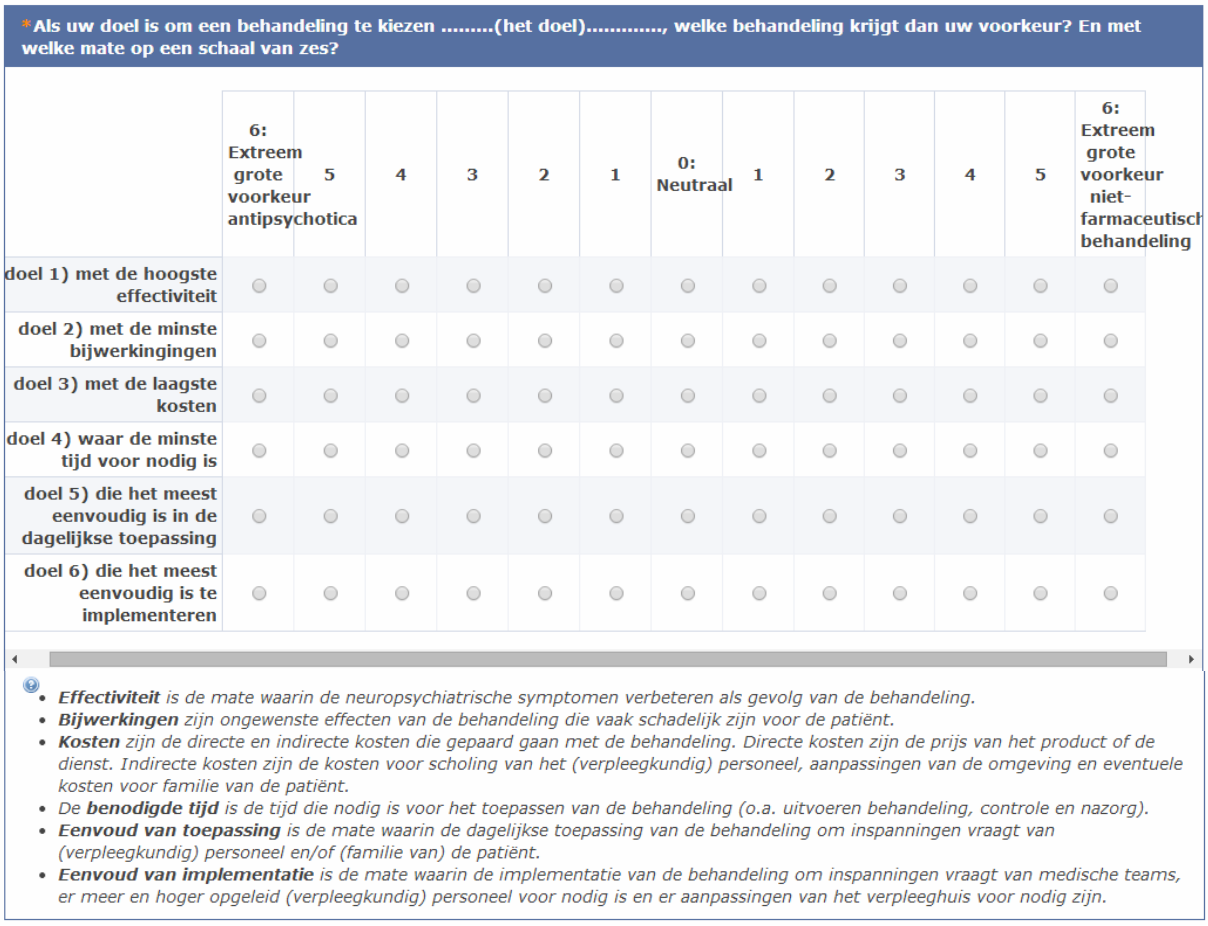
Kenmerken van behandelingen

In het maken van een keuze tussen behandelingen kunt u kijken naar verschillende kernmerken van de behandelingen. Er kunnen verschillen bestaan in hoe u deze kenmerken beoordeelt bij de verschillende soorten behandelingen.

De volgende vragen gaan in op zes kenmerken, waarbij voor elke behandeling een soort doel wordt gesteld; de gewenste situatie. Hierbij dient u aan te geven in welke mate een behandeling, de behandeling met antipsychotica* of de niet-farmaceutische behandeling*, de voorkeur krijgt ten aanzien van het genoemde doel op een schaal van zes***. U kunt ook aangeven geen voorkeur te hebben door met een '0' voor neutraal te kiezen.

Toelichting:

- ** Bij* ***antipsychotica*** *gaat het zowel om klassieke (typische) antipsychotica (zoals haloperidol) als om atypische (zoals olanzapine en risperidon).*
- *** De* ***niet-farmaceutische behandeling****, psychosociale begeleiding en behandeling, omvat de afspraken en interventies gericht op de patiënt of zijn omgeving. Voorbeelden van niet-farmaceutische interventies zijn: standaard therapie zoals gedragstherapie, therapie om herinneringen op te halen en cognitieve stimulatie, interventies gericht op zintuigactivering zoals snoezelen (mulit-sensory activation), aromatherapie, muziektherapie en lichttherapie, activiteiten zoals schilderen en puzzelen, bewegingstherapie zoals dansen en sport, psychosociale therapie, psycho-educatie voor mantelzorgers en interventies gericht op de omgeving van de patiënt zoals het creëren van een huiselijke omgeving en het aanleggen van een loopcircuit of snoezelruimte.*
- **** **Toelichting op de schaal**: 6 = Extreem grote voorkeur, 5 = Grote voorkeur, 4 = Medium tot grote voorkeur, 3 = Medium voorkeur, 2 = Lichte tot medium voorkeur, 1 = Lichte voorkeur, 0 = Neutraal.*

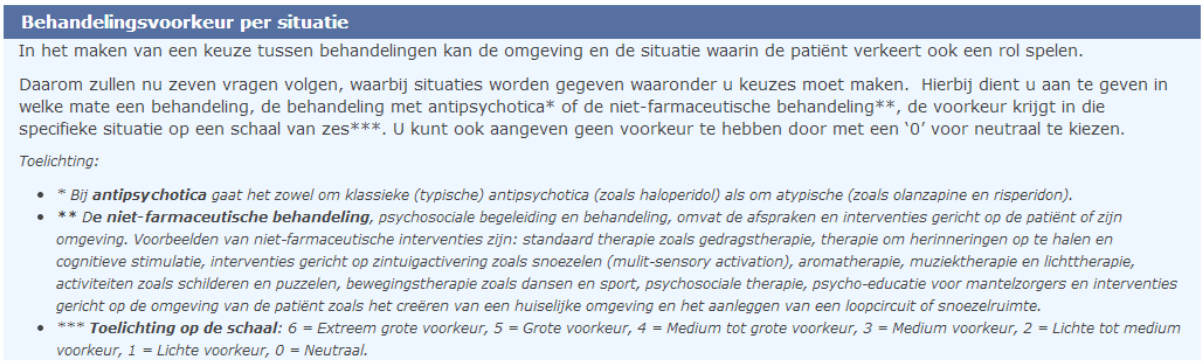


*Als uw doel is om een behandeling te kiezen .....(het doel)....., welke behandeling krijgt dan uw voorkeur? En met welke mate op een schaal van zes?

	6: Extreem grote voorkeur antipsychotica	5	4	3	2	1	0: Neutraal	1	2	3	4	5	6: Extreem grote voorkeur niet-farmaceutisch behandeling
doel 1) met de hoogste effectiviteit	○	○	○	○	○	○	○	○	○	○	○	○	○
doel 2) met de minste bijwerkingingen	○	○	○	○	○	○	○	○	○	○	○	○	○
doel 3) met de laagste kosten	○	○	○	○	○	○	○	○	○	○	○	○	○
doel 4) waar de minste tijd voor nodig is	○	○	○	○	○	○	○	○	○	○	○	○	○
doel 5) die het meest eenvoudig is in de dagelijkse toepassing	○	○	○	○	○	○	○	○	○	○	○	○	○
doel 6) die het meest eenvoudig is te implementeren	○	○	○	○	○	○	○	○	○	○	○	○	○

- ***Effectiviteit*** *is de mate waarin de neuropsychiatrische symptomen verbeteren als gevolg van de behandeling.*
- ***Bijwerkingen*** *zijn ongewenste effecten van de behandeling die vaak schadelijk zijn voor de patiënt.*
- ***Kosten*** *zijn de directe en indirecte kosten die gepaard gaan met de behandeling. Directe kosten zijn de prijs van het product of de dienst. Indirecte kosten zijn de kosten voor scholing van het (verpleegkundig) personeel, aanpassingen van de omgeving en eventuele kosten voor familie van de patiënt.*
- *De* ***benodigde tijd*** *is de tijd die nodig is voor het toepassen van de behandeling (o.a. uitvoeren behandeling, controle en nazorg).*
- ***Eenvoud van toepassing*** *is de mate waarin de dagelijkse toepassing van de behandeling om inspanningen vraagt van (verpleegkundig) personeel en/of (familie van) de patiënt.*
- ***Eenvoud van implementatie*** *is de mate waarin de implementatie van de behandeling om inspanningen vraagt van medische teams, er meer en hoger opgeleid (verpleegkundig) personeel voor nodig is en er aanpassingen van het verpleeghuis voor nodig zijn.*

Figure 5. Perceived performance questions with regard to specific situations.



Behandelingsvoorkeur per situatie

In het maken van een keuze tussen behandelingen kan de omgeving en de situatie waarin de patiënt verkeert ook een rol spelen.

Daarom zullen nu zeven vragen volgen, waarbij situaties worden gegeven waaronder u keuzes moet maken. Hierbij dient u aan te geven in welke mate een behandeling, de behandeling met antipsychotica* of de niet-farmaceutische behandeling**, de voorkeur krijgt in die specifieke situatie op een schaal van zes***. U kunt ook aangeven geen voorkeur te hebben door met een '0' voor neutraal te kiezen.

Toelichting:

- ** Bij* ***antipsychotica*** *gaat het zowel om klassieke (typische) antipsychotica (zoals haloperidol) als om atypische (zoals olanzapine en risperidon).*
- *** De* ***niet-farmaceutische behandeling****, psychosociale begeleiding en behandeling, omvat de afspraken en interventies gericht op de patiënt of zijn omgeving. Voorbeelden van niet-farmaceutische interventies zijn: standaard therapie zoals gedragstherapie, therapie om herinneringen op te halen en cognitieve stimulatie, interventies gericht op zintuigactivering zoals snoezelen (mulit-sensory activation), aromatherapie, muziektherapie en lichttherapie, activiteiten zoals schilderen en puzzelen, bewegingstherapie zoals dansen en sport, psychosociale therapie, psycho-educatie voor mantelzorgers en interventies gericht op de omgeving van de patiënt zoals het creëren van een huiselijke omgeving en het aanleggen van een loopcircuit of snoezelruimte.*
- **** **Toelichting op de schaal**: 6 = Extreem grote voorkeur, 5 = Grote voorkeur, 4 = Medium tot grote voorkeur, 3 = Medium voorkeur, 2 = Lichte tot medium voorkeur, 1 = Lichte voorkeur, 0 = Neutraal.*

***Wanneer .....(de situatie)....., welke behandeling krijgt dan uw voorkeur? En met welke mate op een schaal van zes?**

	6: Extreem grote voorkeur antipsychotica	5	4	3	2	1	0: Neutraal	1	2	3	4	5	6: Extreem grote voorkeur niet-farmaceutisch behandeling
situatie 1) de neuropsychiatrische symptomen veelvuldig of zelfs continu en in ernstige vorm voorkomen	○	○	○	○	○	○	○	○	○	○	○	○	○
situatie 2) de patiënt een slechte gezondheidstoestand heeft, met co-morbiditeit, polyfarmacie en de patiënt niet meer in staat is om zelfstandig te zijn	○	○	○	○	○	○	○	○	○	○	○	○	○
situatie 3) de beschikbare tijd om de patiënt te evalueren zeer beperkt is	○	○	○	○	○	○	○	○	○	○	○	○	○
situatie 4) er weinig verpleegkundigen per patiënt beschikbaar zijn	○	○	○	○	○	○	○	○	○	○	○	○	○
situatie 5) het gemiddelde opleidingsniveau van de verpleegkundigen, op de afdeling waar de patiënt behandeld wordt, laag is	○	○	○	○	○	○	○	○	○	○	○	○	○
situatie 6) de familie van de patiënt druk uitoefent of het belang uitspreekt om snel in te grijpen	○	○	○	○	○	○	○	○	○	○	○	○	○
situatie 7) de verpleegkundigen druk uitoefenen of het belang uitspreken om snel in te grijpen	○	○	○	○	○	○	○	○	○	○	○	○	○

- ***Ernst en frequentie van neuropsychiatrische symptomen*** *is de mate waarin neuropsychiatrische symptomen voorkomen en de ernst van deze symptomen. Neuropsychiatrische symptomen van dementie zijn agitatie/ agressie, psychose, depressie en apathie.*
- ***Ernst van de gezondheidstoestand*** *heeft betrekking op co-morbiditeit, het aantal medicaties dat de patiënt slikt en de mate waarin de patiënt zelfstandig is (Activiteiten Dagelijkse Levensverrichtingen [ADL]).*
- *De* ***beschikbare tijd om de patiënt te evalueren*** *is de tijd die u beschikbaar heeft om de patiënt te evalueren en het juiste behandelplan op te stellen afgestemd op de patiënt (o.a. medische historie, co-morbiditeit en risicofactoren bekijken).*
- ***Gemiddeld aantal verpleegkundigen per patiënt*** *is het gemiddelde aantal verpleegkundigen per patiënt op de afdeling waar de patiënt wordt behandeld.*
- ***Gemiddeld opleidingsniveau van de verpleegkundigen*** *is het gemiddelde opleidingsniveau de verpleegkundigen op de afdeling waar de patiënt wordt behandeld.*
- ***Druk van familie familie om snel in te grijpen*** *komt voor wanneer familie van de patiënt het belang uitspreekt van en druk uitoefent om snel in te grijpen.*
- ***Druk van verpleegkundigen om snel in te grijpen*** *komt voor wanneer verpleegkundigen het belang uitspreken van en druk uitoefenen om snel in te grijpen, bijvoorbeeld als gevolg van noodgevallen op een afdeling.*

Figure 6. Question about comments or suggestions.

APPENDIX D: Importance ranking of the attributes, when calculated for individual responses

Table 8. Importance of attributes related to choosing a treatment for neuropsychiatric symptoms in dementia, according to elderly care physicians, when calculated for individual responses.

	$F(M)_a$ [SD]	$F(L)_a$ [SD]	$F(M)_a$-$F(L)_a$ [SD]	SQRT(($F(M)_a$+1)/($F(L)_a$+1)) [SD]	W_a [SD]
Occurrence and severity of neuropsychiatric symptoms	3.37 [0.83]	0.00 [0.00]	3.37 [0.83]	2.08 [0.22]	0.14 [0.01]
Effectiveness	2.42 [0.96]	0.00 [0.00]	2.42 [0.96]	1.83 [0.26]	0.12 [0.02]
Severity of health impairments	1.53 [0.90]	0.11 [0.32]	1.42 [1.07]	1.53 [0.35]	0.10 [0.02]
Side effects	1.37 [1.12]	0.05 [0.23]	1.32 [1.20]	1.48 [0.40]	0.10 [0.03]
Pressure by nurses to intervene	1.11 [1.05]	0.84 [0.90]	0.26 [1.59]	1.15 [0.47]	0.08 [0.03]
Ease of use	0.74 [0.87]	1.42 [1.26]	-0.68 [2.00]	0.97 [0.50]	0.07 [0.03]
Required time	0.42 [0.51]	0.74 [0.81]	-0.32 [0.95]	0.96 [0.28]	0.07 [0.02]
Available time to evaluate a patient	0.32 [0.67]	0.79 [1.08]	-0.47 [1.47]	0.96 [0.39]	0.06 [0.03]
Ease of implementation	0.63 [0.76]	1.42 [0.96]	-0.79 [1.44]	0.88 [0.38]	0.06 [0.03]
Pressure by family of the patient to intervene	0.16 [0.50]	1.32 [1.42]	-1.16 [1.61]	0.81 [0.32]	0.05 [0.02]
Average educational level of the nurses	0.47 [0.96]	1.74 [0.99]	-1.26 [1.76]	0.79 [0.43]	0.05 [0.03]
Average number of nurses per patient	0.47 [0.90]	1.84 [1.07]	-1.37 [1.71]	0.77 [0.38]	0.05 [0.03]
Costs	0.00 [0.00]	2.74 [1.28]	-2.74 [1.28]	0.55 [0.14]	0.04 [0.01]

$F(M)_a$: Frequency attribute was chosen as most important , $F(L)_a$: Frequency attribute was chosen as least important, $F(M)_a$-$F(L)_a$: The level of importance; a subtraction of the total number of times the attribute was chosen as least important from the total number of times the attributes was chosen as most important, SQRT(($F(M)_a$+1)/($F(L)_a$+1)): The square root of the ratio of most important counts plus one, divided by least important counts plus one, W_a: Attribute importance weight, SD: Standard deviation.

APPENDIX E: Expected treatment choice, when calculated for individual responses

Table 9. Expected treatment choice, based on the perceived performance of the treatment options with regard to each attribute and weighted for the importance of the attributes in choosing a treatment for neuropsychiatric symptoms in dementia, when calculated for individual responses.

	W_a [SD]	$P(AP)_a$ [SD]	$P(NP)_a$ [SD]	W_a * $P(AP)_a$ [SD]	W_a * $P(NP)_a$ [SD]	ETC(AP) [SD]	ETC(NP) [SD]
Occurrence and severity of neuropsychiatric symptoms	0.14 [0.01]	0.68 [0.40]	0.32 [0.40]	0.10 [0.06]	0.04 [0.05]	0.47 [0.16]	0.53 [0.16]
Effectiveness	0.12 [0.02]	0.28 [0.39]	0.72 [0.39]	0.04 [0.05]	0.09 [0.05]		
Severity of health impairments	0.10 [0.02]	0.20 [0.29]	0.80 [0.29]	0.02 [0.03]	0.08 [0.04]		
Side effects	0.10 [0.03]	0.09 [0.20]	0.91 [0.20]	0.01 [0.02]	0.09 [0.03]		
Pressure by nurses to intervene	0.08 [0.03]	0.58 [0.37]	0.42 [0.37]	0.05 [0.04]	0.03 [0.02]		
Ease of use	0.07 [0.03]	0.58 [0.39]	0.42 [0.39]	0.04 [0.03]	0.03 [0.04]		
Required time	0.07 [0.02]	0.68 [0.35]	0.32 [0.35]	0.04 [0.02]	0.02 [0.03]		
Available time to evaluate a patient	0.06 [0.03]	0.41 [0.33]	0.59 [0.33]	0.03 [0.02]	0.04 [0.03]		
Ease of implementation	0.06 [0.03]	0.66 [0.38]	0.34 [0.38]	0.04 [0.03]	0.02 [0.02]		
Pressure by family of the patient to intervene	0.05 [0.02]	0.47 [0.32]	0.53 [0.32]	0.03 [0.03]	0.03 [0.02]		
Average educational level of the nurses	0.05 [0.03]	0.48 [0.33]	0.52 [0.33]	0.03 [0.04]	0.02 [0.02]		
Average number of nurses per patient	0.05 [0.03]	0.55 [0.32]	0.45 [0.32]	0.03 [0.03]	0.02 [0.02]		
Costs	0.04 [0.01]	0.53 [0.33]	0.47 [0.33]	0.02 [0.01]	0.02 [0.01]		

W_a: Attribute importance weight, $P(AP)_a$: Normalized performance score antipsychotic treatment with regard to each attribute, $P(NP)_a$: Normalized performance score non-pharmaceutical treatment with regard to each attribute, W_a * $P(AP)_a$: Performance score antipsychotic treatment with regard to each attribute, weighted for the importance of the attributes in choosing a treatment for neuropsychiatric symptoms in dementia, W_a * $P(NP)_a$: Performance score non-pharmaceutical treatment with regard to each attribute, weighted for the importance of the attributes in choosing a treatment for neuropsychiatric symptoms in dementia, ETC(AP): Expected treatment choice for antipsychotic treatment, EP(NP): Expected treatment choice for the non-pharmaceutical treatment, SD: Standard deviation.