

# Dementia Literacy and Its Link to Public Attitudes towards Dementia in Flanders: A Cross-Sectional Survey among Health Professionals, Family Caregivers, and the General Public

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## Abstract

**Background:** The stigma towards dementia has an impact on the quality of life of the people living with the condition as well as their caregivers. However, to date, little is known about the public attitudes towards dementia and dementia literacy in Flanders, the Dutch-speaking part of Belgium. With the present study, we aim to fill that gap. **Methods:** An online questionnaire was created, consisting of sociodemographic questions and the Dutch translations of the Dementia Knowledge Attribute Scale (DKAS) and the Dementia Attitudes Scale (DAS). Respondents were divided into three clusters: health professionals, family caregivers, and the general public. Demographic information and exposure to dementia were surveyed as well. The survey was disseminated online targeting Flemish adults in all three clusters. The data from the two validated surveys and the demographic information were analysed by means of descriptive statistics and bivariate correlations. Finally, our findings regarding knowledge and attitudes are compared cross-culturally to findings of previous research using the same validated scales (DKAS and DAS). **Results:** Our final sample contained 6351 valid answers across the three clusters: the general public (N = 3094), health professionals (N = 1686), and family caregivers (N = 1196). The findings indicate a knowledge gap concerning “Risk and Health Promotion” in Flanders. Our comparison between the three clusters show that health professionals had the highest attitudes scores, as well as the best overall dementia knowledge scores. The correlation analysis also revealed that dementia exposure in the general population increased attitude and knowledge scores. A comparison of recent literature reveals a large

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variation in dementia knowledge and dementia attitudes cross-culturally. **Conclusion:** The present study shows that there is still room for improvement concerning dementia knowledge and attitudes in Flanders. It also shows the importance of campaigns and training programmes specifically tailored for each cluster separately.

## Keywords

Public Perception, Stigmatisation, Survey, Public Attitudes, Dementia Literacy

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## 1. Background

Dementia is recognised by the [World Health Organisation \(2017\)](#) as a public health priority. Today, there are more than 55 million people living with dementia worldwide ([Alzheimer's Disease International, 2019](#)). With age being the biggest risk factor, there is about a 1 in 5 chance that a person will develop dementia ([Expertisecentrum Dementie Vlaanderen, 2020](#)). As these numbers are predicted to increase and as to this date the condition is still incurable, dementia awareness and friendliness are important factors to ensure quality of life for the people living with it ([World Health Organisation, 2017](#)). Currently, these factors are not yet guaranteed, as a global survey published in the World Alzheimer Report in 2019 has shown that dementia still is a stigmatised condition ([Evans-Lacko et al., 2019](#)).

The double stigma surrounding dementia includes, on the one hand, ageism (i.e., negative attitudes towards old age), and on the other hand, the stigma surrounding mental illness ([Amjad et al., 2018](#)). It can have negative consequences for the persons with dementia, as the stigma can affect their self-esteem and lead to social isolation ([Evans, 2018](#)). From a medical point of view, the stigma can result in a delayed diagnosis of dementia, caused by a reluctance to seek help ([Amjad et al., 2018](#)), as well as by the withholding of the diagnosis by health professionals ([Low et al., 2019](#)).

Consequently, the global action plan published by the [World Health Organisation \(2017\)](#) emphasises the need for campaigns and training programmes to reduce dementia-related stigma. [Kim et al. \(2019\)](#) proposed two evidence-based approaches to counter this stigma, namely contact with the people living with dementia and general education on the condition. An in-depth analysis of the current attitudes towards dementia, as well as of the current dementia literacy is needed to propose appropriate improvement strategies, tailored campaigns, and training programmes.

[Evans-Lacko et al. \(2019\)](#) measured the public perception of dementia by means of a global survey, which focused on three main aspects, namely “knowledge”, “attitudes”, and “behaviour”. Their survey received almost 70,000 responses spread over 155 countries. They found a knowledge gap and detected negative attitudes towards both people living with dementia and the condition

itself. Over the last decade, similar smaller scale initiatives have surged to survey attitudes in various nations and regions.

McParland et al. (2012) investigated dementia knowledge and attitudes of the general public in Northern Ireland, using a non-standardised survey, receiving 1204 responses. They found a “reasonable” dementia literacy, with overall lower scores where risk and prevention were concerned (McParland et al., 2012). The test was translated to Arabic by Hamieh et al. (2019) and filled out by 254 Lebanese primary healthcare providers (without dementia). More than half of the participants scored low on knowledge and had a negative perception towards people living with dementia. In Germany, Lüdecke et al. (2016) found relatively high uncertainty levels concerning cause, prevention, diagnosis, treatment, and life impact of the condition (N = 1795) with a non-standardised survey.

In the present study, we have opted for the use of validated scales, namely the Dementia Knowledge Attribute Scale (DKAS, Annear et al., 2017) and the Dementia Attitudes Scale (DAS, O’Connor & McFadden, 2010). This way, our findings are fit to be put into a larger perspective, by comparing them to results in other countries.

Annear et al. (2017) developed and tested the DKAS on 3649 international respondents from 97 different countries, who participated in a dementia-related online course. The participants filled out a questionnaire containing 25 true/false statements related to dementia, with 50 as maximum possible score. The respondents were from several (occupational) groups, which was found to have had an effect on their scores on the DKAS: 918 nurses (M = 37.89, SD = 7.63), 912 professional carers (M = 34.53, SD = 8.41), 115 family caregivers (M = 34.46, SD = 6.75), and 856 members of the general public (M = 32.52, SD = 9.05). Eccleston et al. (2019) also used the DKAS to verify dementia knowledge of 4894 international respondents before (and after) completing a dementia-related online course. They found a median score of 34.5 out of 50 before the start of the course, which correlated with dementia-related exposure, as well as general education. More recently, the DKAS was used by Crawley et al. (2022) to measure the dementia knowledge of 150 family caregivers in the UK, whose mean scores were 34.8 out of 50 (SD = 7.0). They found that dementia knowledge positively correlated with a greater health literacy as well as more years of education.

The DAS measures attitudes towards dementia using 20 statements, scored with 140 as a maximum. It was developed and tested by O’Connor and McFadden (2010) on 157 nursing assistant students in the USA (M = 98.6, SD = 12.8). The scale was translated into Dutch by de Veer (2018) and tested in a municipality in the Netherlands on 92 randomly selected participants (M = 98.6, SD = 14.2). The test was also used in the Republic of Serbia (Stanic et al., 2021) with 159 medical students (M = 100.5, SD = 10.9) and 124 nurses (M = 95.5, SD = 16.1). In Switzerland, Blaser and Berset (2019) also measured attitudes of 417 nurses (M = 114.7, SD = 13.5). They looked closer at potential factors that contributed to these scores and found correlations with the care setting, but not with age, gender, employment, degree, or experience. The DAS was also used in other

countries, such as India (Strøm et al., 2019) with 15 nurses ( $M = 107.9$ ,  $SD = 10.9$ ).

Some studies, such as Strøm et al. (2019), have used more than one scale in their survey, and have measured dementia knowledge as well as attitudes. In other words, the DAS has been combined with the DKAS before, in other surveys. Chan et al. (2020), for instance, looked at both factors and how they improved after a training programme for 1069 professional caregivers in Hong Kong. Compared to the previously mentioned studies, the participants scored low on the DKAS ( $27.7/50$ ,  $SD = 8.6$ ) and average on the DAS ( $102.2/140$ ,  $SD = 12.0$ ) before training.

## 2. Research Aims

The aforementioned studies have stressed that amidst common attitudes there are also important regional variations in attitudes and knowledge. To date, no equivalent research has actively measured public attitudes towards dementia and dementia literacy in Flanders, the Dutch-speaking part of Belgium. We aim to fill that gap by answering the following research questions:

RQ1: What is the current level of dementia knowledge in Flanders?

RQ2: What are the current attitudes towards dementia in Flanders?

RQ3: What factors (demography, knowledge, and/or exposure) contribute to attitudes towards dementia in Flanders?

On the one hand, we aim to give a general overview of dementia knowledge and current attitudes towards dementia in Flanders, on the other hand, we compare attitudes of professionals, family caregivers, and people without any experience caring for persons with dementia (“the general public”). We differentiate between these groups to ensure the possibility of developing tailored campaigns, workshops, and training programmes to enhance dementia literacy and dementia friendliness. We expect health professionals and family caregivers to have higher dementia friendliness and dementia literacy than the general public, with more specific gaps in knowledge, if any. Second, we expect to find negative attitudes in the general public in Flanders, in line with the findings of Creten et al. (2022) in their analysis of the presence of stigma in Dutch language tweets. Furthermore, as shown by Kim et al. (2019), we expect exposure to dementia to be strongly positively correlated with more positive attitudes towards the condition.

## 3. Materials and Methods

The present research methodology, as well as the questionnaire, was ethically approved by the Ethics Committee Research (EC Research) of University Hospitals Leuven (reference number: S62589).

### 3.1. Data Instruments

In order to answer our research questions, we created an online questionnaire consisting of three parts. The first part included three screening questions (re-

spondents must be over 18, live in Flanders, and express their consent), and several demographic questions. Concretely, we asked the participants' year of birth, gender, province of residence (in Belgium), and educational background. For the province of residence, we included provinces in Wallonia, the French speaking part of Belgium. We did not expect many results from these regions, as the survey was only distributed in Dutch. Next, we surveyed exposure to dementia, asking respondents whether they knew/had known anyone with dementia. Also, we verified whether they (had) worked with people living with dementia in their daily lives, as a family caregiver, and/or as a health professional. The second and third part consisted of the Dutch translations of two validated scales: the Dementia Knowledge Attribute Scale (DKAS) (Annear et al., 2017) and the Dementia Attitudes Scale (DAS) (O'Connor & McFadden, 2010).

The questionnaire was created using Qualtrics, was completely anonymous and had a duration of approximately 15 minutes.

### **3.1.1. Dementia Knowledge Attribute Scale (DKAS)**

The Dementia Knowledge Attribute Scale (DKAS) is an English-language scale created and validated by Annear et al. (2017). It consists of 25 statements that are factually correct or incorrect, and as such it measures participants' knowledge of dementia. The DKAS contains statements relating to four general themes: "Causes and Characteristics" (e.g. "Dementia is a normal part of the ageing process"), "Communication and Behaviour" (e.g. "People experiencing advanced dementia often communicate through body language"), "Care Considerations" (e.g. People experiencing dementia often have difficulty learning new skills), and "Risks and Health Promotion" (e.g. "Having high blood pressure increases a person's risk of developing dementia"). Respondents can answer on a 4-point Likert scale (true, probably true, probably false, false), with an added "I don't know" option, which is included to discourage guessing. The responses to the DKAS are scored with 50 as a maximum (with 2 points for a correct response, 1 for a correct "probably false" or "probably true" response, and 0 for an incorrect response or an "I don't know").

The validated scale was translated into Dutch using the four-step approach proposed by the World Health Organisation: forward translation, expert panel, back-translation, and pre-testing and cognitive interviewing. The first step consisted of the forward translation of the questionnaire by a professional translator, specialised in medical translation, who has the target language, Dutch, as first language. Secondly, a bilingual expert panel, consisting of the investigators, an expert in Dutch, two members of a Flemish dementia organisation, and an expert in English, reviewed the result of the first step. As a third step, the survey was translated back to English by another professional translator, with English as their first language. Finally, the questionnaire was pre-tested on ten members of the target population who differed in gender, age, place of residence, and education, followed by cognitive interviews held by the principal investigator of the present study.

### 3.1.2. Dementia Attitudes Scale (DAS)

The Dementia Attitudes Scale (DAS) is an English-language scale created and validated by O'Connor and McFadden (2010). It measures the affective, behavioural, as well as the cognitive components of attitudes towards dementia. Among the DAS statements, two general themes were identified by O'Connor and McFadden: "Dementia Knowledge" (e.g., "People with ADRD can feel when others are kind to them") and "Social Comfort" (e.g., "I feel relaxed around people with ADRD"). The scale consists of 20 questions on a 7-point Likert scale (1 = totally disagree to 7 = totally agree). Six of these items were reverse scored. The responses to the DAS are scored with 140 as a maximum. The Dutch translation used for the present study was made according to the recommendations of the World Health Organisation by de Veer (2018).

### 3.2. Data Collection

The present survey has three target groups (henceforth called clusters), namely health professionals, family caregivers, and the general public. Consequently, we used cluster sampling. The free online software OpenEpi (<https://www.openepi.com/>) and information of the population provided by Statbel were used to calculate the following minimal sample sizes for the survey, with a 95% confidence interval: 768 health professionals, 765 family caregivers, and 769 non-experts from the general population.

The questionnaire had an online format. It was distributed on a wide scale, by using social media (e.g. regional Facebook groups) and by contacting health organisations (e.g. nursing homes, medical centres). Finally, the assistance of Flemish dementia organisations, such as the "Expertisecentrum Dementie Vlaanderen", was crucial in reaching family caregivers of persons with dementia.

Participation was voluntary. Respondents were eligible if they were over 18, lived in Belgium, and expressed their consent. Their responses were excluded if they contained invalid data, such as an impossible year of birth, or missing data (such as the expression of consent). No external incentives were provided for responding to the survey.

The survey was intended to run for a 12-month period, but due to the added assistance by the Agency for Care and Health of the Flemish government in its distribution, it ran for 14 months instead, from 01/03/2021 to 01/05/2022.

### 3.3. Data Analysis

All statistical analyses were conducted using SPSS (version 28.0.0.0). The responses to the DKAS were scored with 50 as a maximum. The responses to the 7-point Likert scale of the DAS were scored with 140 as a maximum. The scales were checked for internal consistency, using Cronbach's alpha and McDonald's omega values. Descriptive statistics were used to present the demographic characteristics of the sample. Bivariate correlations (Spearman's Rho, 2-tailed) were run on the demographic information, the exposure to people with dementia, and the scores. Then, as the data were not normally distributed, which is often the

case in social survey data (Annear et al., 2017), non-parametric equivalents for the ANOVA (i.e., Kruskal-Wallis test) were used to analyse differences in scores across the three clusters (general public, health professionals, and family caregivers).

## 4. Results

### 4.1. Participants' Demographic Characteristics

We received 6416 complete answers (i.e., without missing information) for the indicated period. Of those 6416, sixty-five answers were considered invalid, as participants indicated that they were younger than 18 years old or did not have the Belgian nationality. Our final sample contained 6351 valid answers. Of the 6351 participants, 48.72% belonged to the general public ( $N = 3094$ ), 26.55% were active as health professionals and worked with people living with dementia ( $N = 1686$ ), 18.83% were family caregivers ( $N = 1196$ ), and 5.90% indicated to be both family caregivers and health professionals working with people living with dementia ( $N = 375$ ). We included the final group in both relevant clusters (health professional and family caregiver) for the demographics in **Table 1**.

The vast majority (82.96%) of our respondents were female, especially in the case of the health professionals (91.90%) and the family caregivers (85.68%). On average, our participants were approximately 51 years old when they filled out the survey. The standard deviation ( $SD = 14.81$ ) indicates the variation of age of our participants, ranging from 18 to 93 years old. The health professionals in our sample were on average approximately 6 years younger ( $SD = 12.72$ ), while the family caregivers were generally six years older, with a smaller standard deviation ( $SD = 11.82$ ). Concerning the province of residence, our respondents were distributed rather evenly across the Flemish provinces, which was also true for each cluster separately. As expected, we received few responses from Flemish people who live in provinces in the French-speaking part of Belgium, so we combined their provinces to the general region, Wallonia. We also asked for the degree of education of the respondents, where we noticed that the majority of the respondents had finished secondary education (32.11%) or was in the possession of a bachelor's degree (40.78%). This was especially true for the health professionals in our sample (54.59%). These numbers reflect the number of highly educated people in Flanders, according to the findings of the Labour Force Survey (Statistiek Vlaanderen, 2022). Concerning exposure, most of our respondents knew or had known someone with dementia. For the general public, only 1 in 6 (17.19%) did not know anyone living with the condition.

### 4.2. Knowledge and Attitudes

The internal consistency of the DKAS and DAS were both found to be acceptable ( $\alpha = 0.83$ ;  $\omega_h = 0.82$  and  $\alpha = 0.90$ ;  $\omega_h = 0.90$ , respectively).

As indicated in **Table 2**, the total sample mean score for the DKAS was 27.27 (max. = 50,  $SD = 8.33$ ), with a range from 0 to 50. The health professionals

**Table 1.** Demographic characteristics of the valid participants, by cluster and in total (N = 6351).

	<b>n health professionals (N = 2061)</b>	<b>n family caregivers (N = 1571)</b>	<b>n general public (N = 3094)</b>	<b>Total (N = 6351)</b>
<b>Gender</b>				
Female	<b>1894</b> (91.90%)	<b>1346</b> (85.68%)	<b>2376</b> (76.79%)	<b>5269</b> (82.96%)
Male	<b>163</b> (7.91%)	<b>222</b> (14.13%)	<b>714</b> (23.08%)	<b>1072</b> (16.88%)
Other/I'd rather not say	<b>4</b> (0.19%)	<b>3</b> (0.19%)	<b>4</b> (0.13%)	<b>10</b> (0.16%)
<b>Province</b>				
Antwerp	<b>450</b> (21.83%)	<b>338</b> (21.51%)	<b>645</b> (20.85%)	<b>1349</b> (21.24%)
East Flanders	<b>455</b> (22.08%)	<b>351</b> (22.34%)	<b>624</b> (20.17%)	<b>1347</b> (21.21%)
Flemish Brabant and Brussels	<b>297</b> (14.41%)	<b>281</b> (17.89%)	<b>697</b> (22.53%)	<b>1226</b> (19.30%)
Limburg	<b>223</b> (10.82%)	<b>178</b> (11.33%)	<b>409</b> (13.22%)	<b>765</b> (12.05%)
West Flanders	<b>626</b> (30.37%)	<b>409</b> (26.03%)	<b>700</b> (22.62%)	<b>1624</b> (25.57%)
Wallonia	<b>10</b> (0.49%)	<b>14</b> (0.89%)	<b>19</b> (0.61%)	<b>40</b> (0.63%)
<b>Degree</b>				
No degree	<b>3</b> (0.15%)	<b>17</b> (1.08%)	<b>48</b> (1.55%)	<b>67</b> (1.05%)
Primary education	<b>11</b> (0.53%)	<b>30</b> (1.91%)	<b>48</b> (1.55%)	<b>87</b> (1.37%)
Lower secondary education	<b>43</b> (2.09%)	<b>103</b> (6.56%)	<b>223</b> (7.21%)	<b>363</b> (5.72%)
Higher secondary education	<b>618</b> (29.99%)	<b>497</b> (31.64%)	<b>1025</b> (33.13%)	<b>2039</b> (32.11%)
Bachelor's degree	<b>1125</b> (54.59%)	<b>669</b> (42.58%)	<b>1022</b> (33.03%)	<b>2590</b> (40.78%)
Master's degree	<b>249</b> (12.08%)	<b>233</b> (14.83%)	<b>686</b> (22.17%)	<b>1133</b> (17.84%)
Doctorate degree/higher	<b>12</b> (0.58%)	<b>22</b> (1.40%)	<b>42</b> (1.36%)	<b>72</b> (1.13%)
<b>Exposure to dementia</b>				
Yes	<b>2061</b> (100.00%)	<b>1571</b> (100.00%)	<b>2562</b> (82.91%)	<b>5819</b> (91.62%)
No	<b>0</b> (0.00%)	<b>0</b> (0.00%)	<b>532</b> (17.19%)	<b>532</b> (8.38%)



## Continued

	Mean (SD)		Mean (SD)	
<b>Year of birth</b>	<b>1976.43</b>	<b>1964.17</b>	<b>1970.38</b>	<b>1970.71</b>
Age	45.50 (12.72)	57.74 (11.82)	51.44 (15.73)	51.15 (14.85)

**Table 2.** Mean and standard deviation of the DKAS (knowledge) and DAS (attitude) scores for all valid participants, by cluster and in total (N = 6351).

	Health professionals (N = 2061) Mean (SD)	Family caregivers (N = 1571) Mean (SD)	General public (N = 3094) Mean (SD)	Total (N = 6351) Mean (SD)
<b>DAS Score (max. = 140)</b>	123.22 (11.49)	112.61 (14.73)	102.13 (14.75)	110.24 (16.48)
Social Comfort (max. = 70)	60.30 (7.42)	54.05 (9.56)	45.71 (10.56)	51.59 (11.38)
Knowledge (max. = 70)	62.92 (5.40)	58.56 (7.00)	56.41 (6.65)	58.65 (6.96)
<b>DKAS Score (max. = 50)</b>	32.96 (7.18)	28.51 (7.43)	23.65 (7.39)	27.27 (8.33)
Causes and characteristics (max. = 14)	9.58 (2.70)	8.04 (2.78)	6.91 (2.68)	7.90 (2.94)
Communication and behaviour (max. = 12)	8.92 (2.35)	7.04 (2.81)	5.62 (2.68)	6.84 (2.97)
Care considerations (max. = 12)	8.67 (2.36)	8.82 (2.41)	7.45 (2.74)	8.10 (2.65)
Risks and health promotion (max. = 12)	5.79 (2.77)	4.60 (2.58)	3.67 (2.26)	4.44 (2.63)

scored generally higher, followed by the family caregivers where more variation was found. We also looked at the distribution of scores across the four themes that [Annear et al. \(2017\)](#) identified in their study. We noticed there that health professionals scored higher on each subscale, except for “Care Considerations”. There, family caregivers did slightly better. This difference, however, was not significant ( $\rho = 0.226$ ). Across each cluster, least was known about risks and health promotion ( $M = 4.44$ , max. = 12), with questions as “Having high blood pressure increases a person’s risk of developing dementia” or “Symptoms of depression can be mistaken for symptoms of dementia”. We also looked at the level of doubt (indication of “I don’t know”) across themes in the DKAS and noticed that there was almost no indicated doubt concerning “Care Consideration” (5.60%), while 1 in 5 (19.19%) indicated “I don’t know” when answering “Risks and Health Promotion” questions.

For the DAS, the mean score was 110.24 (SD = 16.48) with a range from 47 to 140 (see [Table 2](#)). Again, we found that health professionals had the overall highest scores, followed by the family caregivers. Concerning the subscales indi-

cated by O'Connor and McFadden (2010), we noticed that our respondents scored higher on statements related to "Dementia Knowledge" than on those related to "Social Comfort". The differences across as well as within clusters was also highest where "Social Comfort" was concerned, especially on statements as "I feel relaxed around people with ADRD" or "It is rewarding to work with people who have ADRD".

### 4.3. Relations between Variables

**Table 3** shows the correlations of the variables included in our analysis. The DAS score measuring attitudes was significantly positively correlated with the DKAS score on dementia knowledge ( $r = 0.596$ ,  $\rho \leq 0.01$ ). In order to ensure brevity and readability, we did not mention the scores on the DKAS and DAS subscales in **Table 3**. However, as the DAS also considers dementia knowledge, we also looked at the correlation between the DKAS and the DAS subscale "Social Comfort". There, as well, a strong positive correlation was found ( $r = 0.547$ ,  $\rho \leq 0.01$ ).

The DAS also strongly positively correlated with the cluster of the respondent. Health professionals in our sample showed the strongest positive correlation with attitudes ( $r = 0.562$ ,  $\rho \leq 0.01$ ), while for the general public, their cluster was strongly negatively correlated with their attitudes ( $r = -0.489$ ,  $\rho \leq 0.01$ ). This means that the health professionals in our sample generally had higher attitude scores than other respondents, while the general public scored lower. We also noticed the positive correlation with exposure to dementia in our sample.

**Table 3.** Correlations among the collected variables. Clusters are indicated by abbreviations: public = general public, carers = family caregivers, and HP = healthcare professionals (N = 6351).

	Year of birth <sup>a</sup>	Gender <sup>b</sup>	Province <sup>c</sup>	Degree <sup>d</sup>	Exposure <sup>e</sup>	Cluster Public <sup>f</sup>	Cluster Carers <sup>f</sup>	Cluster HP <sup>f</sup>	DKAS score	DAS score
Year of birth <sup>a</sup>	–									
Gender <sup>b</sup>	0.203**	–								
Province <sup>c</sup>	-0.031*	0.015	–							
Degree <sup>d</sup>	0.139**	-0.047**	-0.044**	–						
Exposure <sup>e</sup>	-0.108**	0.051**	0.008	-0.004	–					
Cluster Public <sup>f</sup>	-0.033**	-0.161**	-0.023	-0.009	-0.310**	–				
Cluster Carers <sup>f</sup>	-0.255**	0.042**	-0.004	-0.030*	0.173**	-0.559**	–			
Cluster HP <sup>f</sup>	0.285**	0.166**	0.028*	0.049**	0.210**	-0.676**	-0.105**	–		
DKAS score	0.138**	0.155**	0.025*	0.224**	0.210**	-0.427**	0.089**	0.474**	–	
DAS score	0.185**	0.175**	0.018	0.005	0.218**	-0.489**	0.079**	0.562**	0.596**	–

*Notes:* Spearman's rho (two-tailed). \* $\rho \leq 0.05$ , \*\* $\rho \leq 0.01$ . <sup>a</sup>From low (older respondents) to high, <sup>b</sup>0 = male, 1 = female, <sup>c</sup>0 = Wallonia, 1 = Antwerp, 2 = Limburg, 3 = East Flanders, 4 = Flemish Brabant and Brussels, 5 = West Flanders, <sup>d</sup>Ranging from low education (no degree = 0) to highest form of education (Doctorate degree/higher = 6), <sup>e</sup>0 = no exposure, 1 = knows someone with dementia, <sup>f</sup>0 = no member of cluster, 1 = member of cluster.

Finally, a small positive correlation was found for year of birth (the younger, the more positive attitudes), and gender (women had higher scores).

For knowledge (the DKAS), similar tendencies were present in our sample. However, we also noticed there that the DKAS was positively correlated with the degree of the respondent, while this is not the case for their DAS score.

The Kruskal-Wallis test was then used to verify whether the differences across the three clusters were significant. Its results indicate significant cluster differences for the DAS ( $\chi^2 = 1843.00$ ,  $df = 2$ ,  $\rho < 0.001$ ) as well as for the DKAS scores ( $\chi^2 = 1317.37$ ,  $df = 2$ ,  $\rho < 0.001$ ).

## 5. Conclusion

With the present study, we aimed to give a general overview of dementia knowledge and attitudes towards dementia in Flanders. Our sample consisted of 6351 respondents from three main clusters: the general public, family caregivers, and health professionals who were exposed to dementia in their work life.

For the first research question, we aimed to measure the current level of dementia literacy in Flanders. We did so by means of a Dutch translation of the DKAS (Annear et al., 2017). The mean DKAS score in our sample was 27.27 (SD = 8.33). The findings for each theme separately indicated a knowledge gap concerning “Risk and Health Promotion” in Flanders. Our comparison between the three clusters showed that health professionals had the best overall scores on the dementia knowledge test, but that family caregivers scored slightly higher on statements related to “Care Considerations”, although the difference was not significant.

For the second research question, we measured attitudes towards dementia and the people living with it in Flanders by means of the Dutch translation (de Veer, 2018) of the DAS (O’Connor & McFadden, 2010). The mean DAS score in our sample was 110.24 out of 140 (SD = 16.48). Health professionals had the highest scores (123.22), followed by family caregivers (112.61), and the general public (102.13).

For the third research question, we looked at the factors that correlated with dementia attitudes. We took year of birth, gender, province of residence, degree, and dementia knowledge into consideration. We also verified whether the respondent knew someone with dementia, which was the case for a very large majority of the general public (82.91%). As expected, exposure as well as dementia knowledge were positively correlated with dementia-friendly attitudes. We noticed that the attitudes of health professionals and family caregivers were generally higher, and that attitude and cluster were thus related. We also found a small positive correlation between age and attitudes, as well as between gender and attitudes. Finally, we noticed that although a higher degree was correlated to more dementia knowledge, it did not correlate with better attitudes towards dementia in our sample.

## 6. Discussion

In the present research, we found that family caregivers scored higher than

health professionals on statements related to “Care considerations”, albeit not significantly. This could be related to the fact that family caregivers generally are more often present in the everyday care of the person with dementia. Compared to similar studies in other countries (see introduction), the Flemish DKAS scores seem lower at first glance. In the study of [Annear et al. \(2017\)](#), for instance, all comparable clusters (nurses/professional carers, family caregivers, and general public) scored approximately five points higher on the DKAS. The cause of this discrepancy could be that all their respondents were about to start an online course that aimed to improve dementia knowledge, which indicates an intrinsic motivation to learn about dementia. The same is true for the participants of the study by [Eccleston et al. \(2019\)](#). In the study of [Crawley et al. \(2022\)](#), dementia knowledge of the 150 UK family caregivers had also much higher mean scores on the DKAS 34.8/50 (+6.3). However, in the study of [Chan et al. \(2020\)](#) in Hong Kong, professional caregivers scored approximately five points lower than the Flemish health professionals in this study. This variation seems to indicate the existence of important differences in dementia knowledge based on regional factors. This could be linked to the degree of stigma towards the condition in each country, as it is probable that in countries where dementia is still a (cultural) taboo ([Alzheimer’s Disease International, 2019](#)), the condition is being less openly discussed. Consequently, this could lead to less knowledge about the condition, especially for the people who do not know someone with dementia. Media channels, such as newspapers, can have an important role in increasing the visibility of a condition, and can as such help to improve dementia knowledge, or to counter harmful stereotypes ([Peel, 2014](#)). However, further research is needed to verify this link between regional variation and media representations. In sum, these regional differences show the importance of specifically tailored dementia literacy campaigns based on the findings of similar regional surveys. In Flanders, for instance, the results of the DKAS have shown the need for a dementia campaign focused on the topics of risks and health promotion.

Concerning attitudes, in our sample, respondents seemed to have more dementia-friendly attitudes than in other studies. Compared to a sample of 92 randomly selected participants in the Netherlands, our participants scored approximately 11 points higher ([de Veer, 2018](#)). The same is true when we compare these results with those of medical students in the USA ([O’Connor & McFadden, 2010](#)) and in the Republic of Serbia ([Stanic et al., 2021](#)) or to those of health professionals in India ([Strøm et al., 2019](#)), in Hong Kong (China) ([Chan et al., 2020](#)), and Switzerland ([Blaser & Berset, 2019](#)). In sum, the attitudes towards dementia in Flanders seem generally better than those measured in other regions. This could be a consequence of evolution in attitudes due to the effect of the Global Action Plan on the Public Health Response to Dementia 2017-2025 ([WHO, 2017](#)), with destigmatisation as a main goal. On the other hand, it could be also influenced by recent regional policies and campaigns focused on increasing dementia-friendliness, organised by the government, the Alzheimer Liga Flanders, the Flanders Centre of Expertise on Dementia, or other organisa-

tions. In 2019, a Flemish campaign, “Vergeet dementie, onthou mens”, specifically aimed to counter stigmatic attitudes and to endorse the ongoing personhood of people living with the condition (Expertisecentrum Dementie Vlaanderen, 2019). More recently, in 2021, the Flemish government launched their second regional action plan for the years 2021 to 2025, emphasising the importance of an increased quality of life for people living with dementia and their caregivers (Beke, 2021).

Exposure and dementia knowledge were found to be linked to positive attitudes towards people living with dementia, which is in line with the strategies proposed by Kim et al. (2019) to counter the stigma towards dementia, namely contact with people with dementia and general education. The small positive correlations between DAS score and year of birth (the younger, the more positive attitudes), and DAS scores and gender (women had higher scores), could also be cluster related. There were more male respondents in the general public cluster compared to the small number of male family caregivers or health professionals in our sample. Also, health professionals were generally younger than other respondents.

The fact that health professionals in our sample seemed to have more dementia knowledge and better attitudes towards the condition, might be related to several factors, such as training during their education or exposure to different types of dementia. We plan, for future work, to take intra-cluster variation across the health professionals in our sample into account, by looking at the effect of experience, training, and specific occupation on DAS and DKAS scores. Also, the degree of exposure to dementia should be taken into further consideration for each cluster, as the effect of exposure on attitudes and knowledge could be influenced by the closeness of the relationship between the respondent and the person with dementia (e.g., close family or colleagues).

The present study has potential limitations. First, we opted for the Dementia Knowledge Attribute Scale, and not for the Alzheimer’s Disease Knowledge Scale (Carpenter et al., 2009), as the DKAS includes other types of dementia than Alzheimer’s Disease which has been shown to perform better with large and diverse groups (Annear et al., 2016). Second, a large majority of the respondents in our sample were women, especially in the case of health professionals and family caregivers. The high prevalence of women is not surprising, as they are the main caregivers around the world (Erol et al., 2015). However, our present sample does not reflect the general gender balance in Flanders. This could be remedied by using different channels for data collection and/or to search and ask specifically for male respondents.

For further research, we propose a closer examination of the correlations intra-cluster would be necessary for a more detailed overview of attitudes. Finally, for brevity, we did not take a closer examination of the results for each statement in the DAS and DKAS separately. We shall do so in further work, as the findings of such an approach might allow policy makers to focus on specific problem

points in the design of campaigns to improve dementia knowledge and attitudes towards people living with dementia in Flanders.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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