

Weet U Wat U Slikt?

The effect of teaching health-related vocabulary and essential medical knowledge to functionally illiterate adults

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Abstract

Background: Functional illiteracy among patients results in a lesser understanding of information regarding medication and misinterpretation within the patient-physician relationship. This could result in incorrect usage of medication and detrimental health complications. In districts such as Delfshaven, with an illiteracy rate of almost thrice the Dutch average of 11,9%, there is a great need for education in health-related vocabulary and essential medical knowledge.

Objective: The objective of this study is to analyze the effect of teaching health-related vocabulary and essential medical knowledge to functionally illiterate adults of minority groups in Delfshaven, the Netherlands.

Methods: In the Rotterdam district Delfshaven, residents with a non-Western background that experienced difficulties with the Dutch language were invited to participate in a community project called “Weet U Wat U Slikt?” (translation: *Do You Know What Medication You Take?*). The participants (n= 305) followed a program of five lessons in the Dutch language and five theoretical lessons about medication and health. Before and after the program, participants filled out a questionnaire of ten questions linked to the subjects that were covered in the medication and health lessons.

Results: 99 (32,5%) of the participants filled out both questionnaires. For each question, an increase in percentage of correct answers was seen. The mean significant improvement in test score results was 25,45% (20,43 – 30,48 [95% CI], p-value <0,05).

Conclusion: Teaching health-related vocabulary and essential medical knowledge to functionally illiterate adults in Delfshaven, the Netherlands led to an increase of 25% in theoretical knowledge.

Introduction

Functional illiteracy is the inability to use reading, writing, and calculation skills for personal and collective development (1). Functional illiteracy is an issue within minority groups in the Netherlands. The Rotterdam district of Delfshaven represents the extent of this issue, as it has an illiteracy rate of 30%, which is almost thrice the Dutch average of 11,9% (5). Furthermore, only 23% of its population is of Dutch origin (6).

Functionally illiterate adults face various obstacles, including challenges in the medical context. Examples of such challenges are barriers with regards to understanding

medication labels and package leaflets, or providing information to and obtaining medical knowledge from the physician. Such a misinterpretation within a patient-physician relationship could lead to detrimental health complications, such as hospitalization. For example, during the Muslim fasting period Ramadan, more people were admitted to the hospital due to incorrect use of their medication (2).

Research shows that these functionally illiterate adults are less likely to ask questions to their health care professionals, but are more inclined to request a statement to be repeated, which suggests difficulties with

understanding information concerning their medication. Additionally, such patients have been found to use less medical terminology, which also implies lesser understanding (3). Other research shows that this group are 3.4 times more likely to interpret medical icons on labels incorrectly (95% confidence interval: 2.3 to 4.9) (4).

Therefore, there is a great need for education in these functionally illiterate adults, so as to attain the knowledge needed to comprehend and apply health-related vocabulary.

The objective of this study is to analyze the effect of teaching health-related vocabulary and essential medical knowledge to functionally illiterate adults of minority groups in Delfshaven, the Netherlands.

Methods

Subjects in this research were participants of a community project called “*Weet U Wat U Slikt?*” (translation: *Do You Know What Medication You Take?*). This ‘Weet U Wat U Slikt’-programme took place in the Rotterdam district Delfshaven and included participants with a non-Western background that experienced difficulties with the Dutch language. People were approached and invited to participate in the ‘Weet U Wat U Slikt’-programme by visiting, for example, mosques and community centres in the district. This was done by several voluntary organisations, including vereniging DSB, Hoedje van Papier, stichting Azagua, Zorgimpuls and Zowel Delfshaven.

The participants received five lessons in the Dutch language and five theoretical lessons about medication and health. They were divided in groups of no more than fifteen participants, and followed lessons together. Lessons were held in different community centres, schools and mosques in Delfshaven.

Dutch language lessons

The Dutch language lessons were given by NT2 teachers specialized in teaching Dutch as a second language, as well as so-called ‘language volunteers’. During five lessons of two hours, the participants worked their way through a textbook and made use of several interactive and educative games, developed by Stichting Hoedje van Papier, a non-profit organisation in Rotterdam. In these lessons, there was a strong focus on language proficiency in healthcare settings, and health literacy.

Theoretical lessons on health & medicine

After completion of the five language lessons, participants received five lessons about medication and health. The first four of these lessons were developed by the authors, and given by medical students from the Erasmus MC. The first lesson consisted of a general introduction to medication, i.e. the mechanisms behind certain medication, when to take medication and where to preserve them. The second lesson discussed the proper way to ingest medication, with a focus on the usage of antibiotics and how to read labels and package leaflets. The third lesson covered subjects such as side-effects and interactions of medication, cultural aspects of medication (medication intake during Ramadan or medication usage from foreign countries) and when to approach your pharmacist or general practitioner. The fourth lesson discussed several common chronic diseases (asthma, COPD, diabetes and cardiovascular diseases). The complete description and study material of these lessons are to be found in appendix 1. Each theoretical lesson was estimated at two hours. The theoretical lessons were given by one medical student, and supported by the language volunteer who also gave the language lessons. The fifth and last lesson was given by a pharmacist or general practitioner, which included answering remaining questions of the participants.

Data collection

In order to test the efficacy of the lesson series, two different questionnaires were used. The first one was filled out by the participants and contained theoretical questions in Dutch about different subjects that were covered in the medication and health lessons, in order to gain insight in the knowledge gained and level of progress in health literacy of the participants. We will call this questionnaire the participants examination (PE). The PE was constructed by the authors based on the subjects of the lessons and contained 10 multiple choice questions. For the complete PE, see appendix 2. Every correct answer equaled one point. Participants could score a total of 10 points on the PE. Every question provided an option 'I don't know', in order to reduce the chance of getting the correct answers due to guessing. When this option was chosen, zero points were given.

The second questionnaire was given to the language volunteer who supported participants during both the language and theoretical lessons of the 'Weet U Wat U Slikt'-programme. The language volunteer filled in this questionnaire for every participant in his/her group. We will call this questionnaire the language volunteer assessment (LVA). The LVA consisted of six questions on skills that were trained during the lessons. For these questions, the language volunteer had to make an estimate of the level of proficiency of the participant with regard to these skills. This could be good (3 points), sufficient (2 points), mediocre (1 point) or insufficient (0 points). A participant could score a total of 18 points on the LVA. The LVA was developed based on different skills that were found important or relevant by the authors and 'Weet U Wat U Slikt'-programme supervisor namely the understanding of medical terms; knowledge on why to take medicine; knowledge on how

to take their medicine; being able to read and understand labels and package leaflets; knowing when to contact a doctor or pharmacist; and being able to maintain a conversation with a doctor or pharmacist. For the complete LVA, see appendix 3.

Both the PE and LVA were filled in during the first (pre-PE/LVA) and last (post-PE/LVA) lesson. The language volunteers received instruction on how to fill in the LVA. They were also instructed to read through the PE classically, discussing any terms or questions that were unclear to the participants, so as to ensure that participants understand the questions fully, and would not give wrong answers due to linguistic barriers.

Statistical analysis

Our primary outcome - the difference between pre-PE and post-PE results - was measured by a Paired Sample T-Test using SPSS.25. A p-value <0,05 was considered as statistically significant.

As a secondary outcome, we looked at the concordance of the outcomes of the PE and LVA, for both the pre- and post-intervention tests. We plotted the results of the PE against those of the LVA and looked for a correlation.

Results

Between the 21st of August and the 21st of December, 305 participants commenced and completed the 'Weet U Wat U Slikt'-programme. The participants consisted of adults originating from various countries, such as Turkey, Morocco, Surinam and Cabo Verde (results not included). All participants were residing in Delfshaven, Rotterdam during the 'Weet U Wat U Slikt'-programme. 99 of these 305 participants (32,5%) filled out both the pre- and post- participants' examination. A flow-chart describing the loss of data and the final sample size can be found in figure 1.

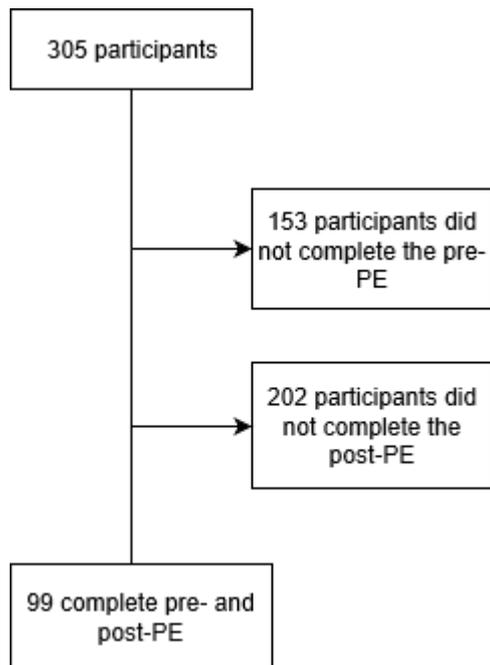


Table 1 – Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Post-PE	7.35	99	2.314	.233
Pre-PE	4.81	99	2.787	.280

Paired differences	Mean	95% CI	Std. Deviation	Std. Error Mean	Significance
	2.545	2.043 - 3.048	2.520	.253	.000

Figure 1 – Flowchart of pre- and post-participant’s examination (PE)

In figure 2, the percentage of correct answers per question on the pre- and the post-Participants’ Examination (PE) is shown. When comparing the pre-and post-PE results, an increase is seen for all questions in terms of the percentage of correct answers. Figure 3 shows a normal distribution of the differences in points between the pre- and post-PE.

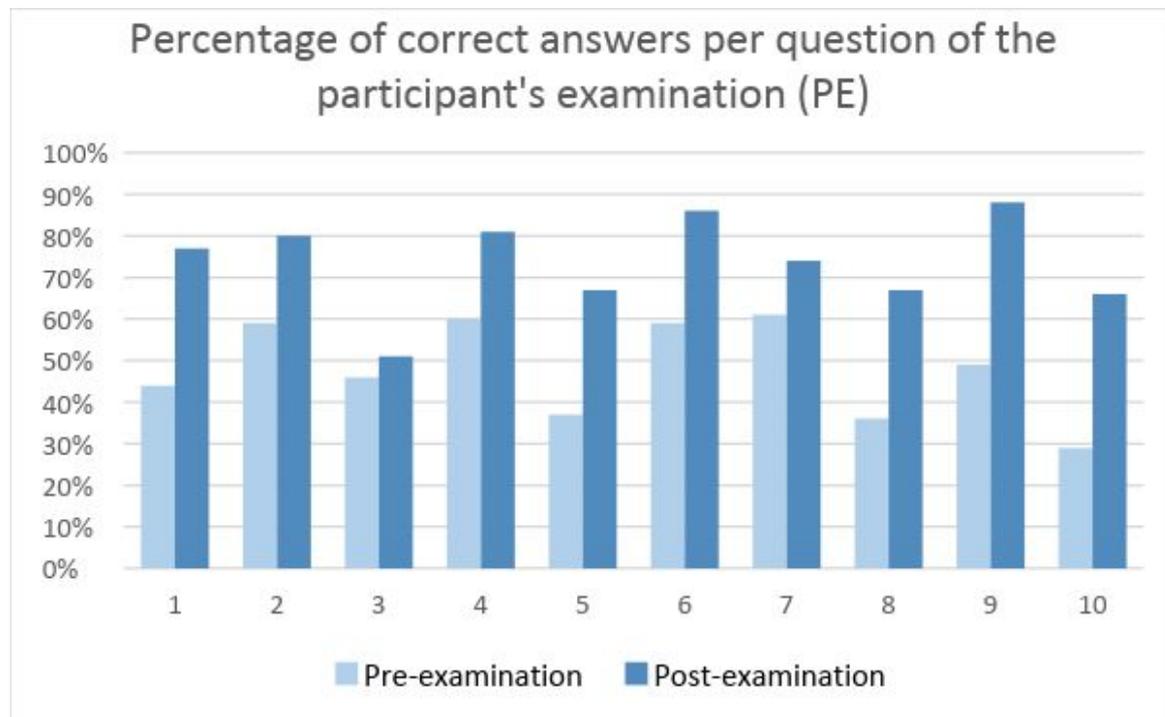


Figure 2 – Percentage of correct answers per question of the participant’s examination (PE)

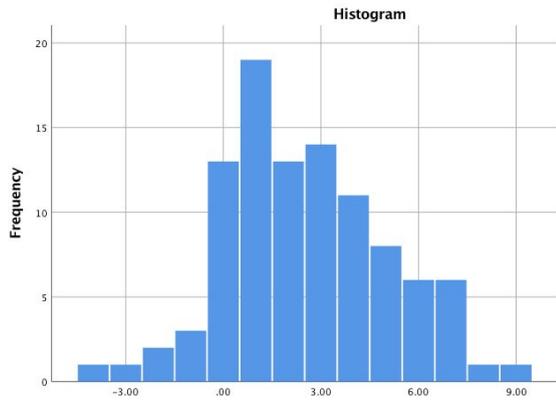


Figure 3 – Distribution of points improved on the participant's examination (PE) plotted against the number of participants

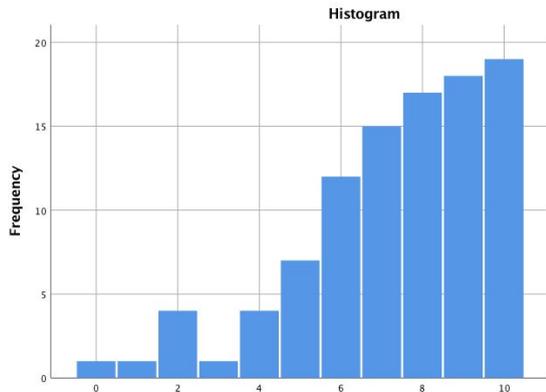


Figure 5 – Distribution of points at the post-participant's examination (PE) plotted against the number of participants

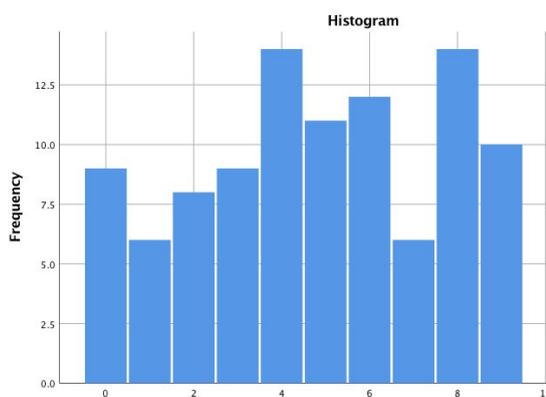


Figure 4 – Distribution of points at the pre-participant's examination (PE) plotted against the number of participants

In figure 4, the results of the pre-PE are shown; in figure 5, the results of the post-PE is shown. We see that the results vary amongst all categories in the former, while the bar graph is right-skewed in the latter.

Table 1 shows that the mean amount of points reached by every participant in one test is 4,81 at the pre-PE. The mean amount of points post-PE was 7,35. The mean significant improvement in test score results was 2,545 (2,043 – 3,048 [95% CI], p-value <0,05).

In figure 6 and 7, a linear relation between the LVA and the PE is suggested, for both pre- and post-results.

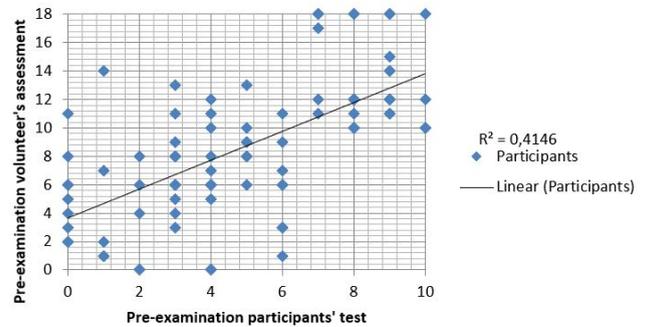


Figure 6 - Pre-examination tests in which the maximum amount of points of the PE is plotted against the maximum amount of points of the LVA

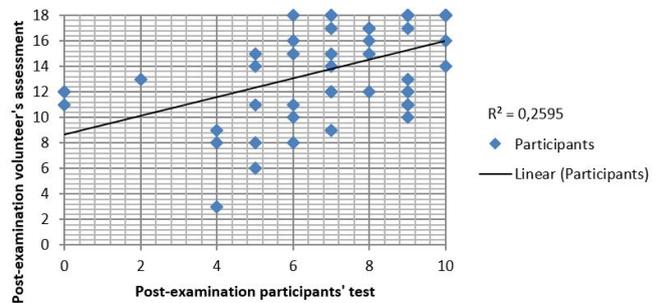


Figure 7 - Post-examination tests in which the maximum amount of points of the PE is plotted against the maximum amount of points of the LVA

Conclusions & Discussion

The major finding of this study is that teaching health-related vocabulary and essential medical knowledge to functionally illiterate adults in Delfshaven, the Netherlands led to an increase of 25% in theoretical knowledge. However, several remarks should be made surrounding our study method and consequent conclusions.

Anonymity of patients and patient characteristics

Participants were included in the programme by aforementioned external voluntary organisations, that had limited records on said participants. This led to a list of characteristics that was scarce and incomplete. Apart from this, we have limited insight in the selection procedure of the participants. Because the recruitment of participants was done by several different organisations, it is plausible that there were differences in the medical knowledge and level of illiteracy of participants. This can also be seen in the large differences between participants' scores at the pre-participant examinations (figure 4) and was mentioned in evaluations with student teachers. We assume that not all participants actually were functional illiterate. Although we think these participants still could have benefitted from this project (students could adapt their lessons to the level of knowledge of their group), our study design falls short in order to determine the progress of these participants. Since there was a notable amount of participants who had a high or maximum score on the pre-participants' examination, we were not able to fully determine their increase in knowledge, which could have influenced our results.

These are major setbacks in our research, as they prohibited us in evaluating the group of participants fully and making conclusions based on these characteristics. For example,

we were unable to make more than an estimation of the academic level of the participants, their level of prosperity, or the level of medical contact of participants (e.g. whether or not they were suffering from a chronic disease). Thus, this restricted us in preventing confounders from influencing our results. We strongly recommend asking for permission for obtaining all information on the population via the medical ethical committee, to ensure full information on the population that will be researched. We also recommend that the level of literacy of participants would be determined before enrolling in the program or study. In order to determine the effect of teaching health-related vocabulary and essential medical knowledge to functionally illiterate adults, literate adults should be excluded from the study.

Limited data on written participant examinations

Only 32,5% of participants (99 of 305 participants) had completely written out the PE. This lack of data on the remaining participants could have many causes. We hypothesize that a number of participants failed to fill out examinations due to the fact that not they did not follow the full curriculum and/or did not stay until the very end of class on the dates of examinations. Indeed, based on experiential information of several student-teachers, some participants were obliged to leave early to fulfill other obligations, such as picking up children from school. We recommend taking the time and dates of the examinations into consideration, in order to prevent such practical difficulties.

A more systemic hurdle of the participant examination is the fact that it is a written test. This poses difficulties when working with and researching on a sample group of adults with a linguistic barrier and/or illiteracy. Of course the language lessons that were provided could

have aided the participants in answering the questions. We also tried to dissolve such issues by providing the aid of a language volunteer, not only in helping during the language lessons, but also during the examinations. However, perhaps the level of linguistic understanding of the tests still prohibited participants in fully filling out the examinations. Possible solutions for preventing such problems include separating the examination of participants' linguistic skills and the examination of their medical knowledge into two tests, by providing the questions on medical knowledge in the native language of the participants. This allows for an examination that purely tests the medical knowledge, and avoids hindrances such as linguistic barriers and/or illiteracy.

Limited questions on participants examination and volunteer assessment

During this research, participants and volunteers were asked to fill out a multitude of questionnaires, including but not limited to the PEs and LVAs. Indeed, other organisations have also asked the participants to provide information in the form of questionnaires/interviews.

Due to an overwhelmingly negative response of the participants and the volunteers after filling out the first draft of pre-PE (which consisted of more than 30 questions), conveying that the tests were too much of a linguistic hurdle and caused demotivation in large amounts of participants, a re-evaluation was done quickly. This led to a drastically shorter PE of merely 10 questions and a LVA of 6 questions. A possible solution would be to test the medical knowledge by means of an oral interview, possibly in the native language of the participant. This might make the PE less of a demotivator.

Validity of the participants examination and volunteer assessment

The PE and LVA were developed by the authors. Albeit the fact that many factors were taken into consideration when developing these, such as the vocabulary that was used and length of the examination, the test is not validated. This was done because of the fact that the authors were unable to find a validated test that examined all subjects that were covered during the lessons. We recommend either finding or developing a validated test for future studies.

PE and LVA

We were interested in whether or not there is a difference in assessment of knowledge based on a theoretical test (PE) as opposed to a judgement of an experienced assessor (LVA). If an experienced assessor believes a participant to be more (or less) knowledgeable than she/he actually is, this might be a reason for a misinterpretation within a patient-physician relationship. For this reason, we included the aforementioned secondary outcome. However, due to a lack of sufficient data and statistical difficulties, we were only able to find a relation between the PE and LVA, and no definitive conclusions could be made. The relation, however, does suggest that a language volunteer is indeed able to assess the knowledge and skills of a participant correctly. We recommend future research to be done on the relationship between the assessment of knowledge level by the experienced assessor (i.e. the physician) and the actual, objective level of knowledge (i.e. a PE), as this is telling of the possible hurdles in the patient-physician relationship.

Future aims

Linguistic and medical education of functionally illiterate adults is an excellent way of providing primary and secondary prevention, as well as an opportunity to strengthen the patient-physician relationship, as the medical community will seem much

more approachable. Furthermore, having young medical professionals be student-teachers allows for this group to experience proper ways of interacting with this frail patient group in the future. The authors hope that this study may be an incentive for future studies and programmes with similar aims of educating both this frail patient group and their future physicians.

Acknowledgements

The authors would like to thank the following organisations and people. The NT2 teachers, the language volunteers, and student-teachers of the Erasmus MC for their skillful teaching and dedication. Prof. dr. Charles Boucher, Leyla Koseoglu, David van de Vijver, and Carola van der Meer for their advice and help during the entire research. DSB, Hoedje van Papier, stichting Azagua, Zorgimpuls and Zowel Delfshaven for their assistance during the 'Weet U Wat U Slikt'-programme.

Conflict

The authors confirm to have no conflicts of interest.

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Appendices

- 1 - The complete description and study material of these lessons (Dutch)
- 2 - The pre- and post-linguistic participants examination (Dutch)
- 3 - The pre- and post-linguistic volunteer assessment (Dutch)
- 4 - The experiences of the students (Dutch)