

The Social and Economic Return of Health Literacy Interventions in the WHO EURO Region

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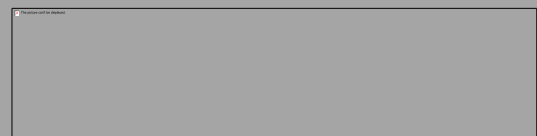
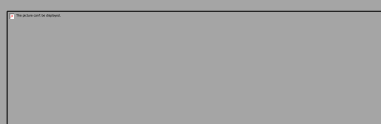
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Abstract

Background: Health literacy allows people to make informed decisions regarding their health, enabling them to understand health promotion activities and to self-manage their disease or complication without requiring support from healthcare services. Health literacy has the potential to support sustainability in health systems by decreasing healthcare expenditure stemming from lowered disease occurrence and progression, it can also impact on the rest of peoples' lives and their surroundings by allowing them to be more independent. This study researched the evidence for return on investment and the social return on investment for health literacy interventions within the WHO EURO region.

Methods: A narrative literature review on published peer-reviewed reviews and grey literature was conducted by use of keywords and MeSH terms. Google, Google Scholar and PubMed were used find literature. The search on PubMed was restricted to reviews, published within the last 10 years (2009-2019), in English.

Results: In total, 450 publications were screened 12 publications that analysed the economic or social aspect of HL interventions were identified. Five discussed the cost-effectiveness of health literacy, three the return on investment (ROI) and the remaining three the social return on investment (SROI) of health literacy. Types of health literacy interventions ranged from health promotion campaigns, web-based HL programs, prevention systems to education-based interventions. Cost-effectiveness differed between studies and fields. Evidence for ROI was found, the return ratios ranged from 0.62 to 27.4. Findings show SROI between 4.41 and 7.25, indicating additional value of social benefit next to improved health.

Conclusions: A link between cost-effectiveness and health literacy interventions was established and ROI and SROI evaluations showed positive ratios. Further research is required in order to investigate whether health literacy interventions consistently achieve positive returns.

Main Messages:

- A link between health literacy interventions and positive investment returns has been established.
- Health literacy interventions show potential for sustainable development of health systems

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1.0 Introduction

Maintaining good health is an important aspect of life and in order to know how to, one needs to be aware of certain health knowledge and skills (Nielsen-Bohlman, Panzer, & Kindig, 2004). This knowledge is brought to the individual through their culture, education system, social surroundings or even the media, and further influenced by socio-demographic indicators such as level of education, age or gender (Sun et al., 2013). Next to the ability to gain this knowledge, it is important that the individual is able to evaluate the sources they received this knowledge from, as the quality of these sources will impact the recipients' health literacy (Diviani, Putte, Giani, & Weert, 2015). In order to maintain and improve good health, one also needs to be able to interact with the health systems that are available to them. As modern health systems allow individuals to be more autonomous in their health decisions, general knowledge and skills are necessary to make sure that the individual is able to do so (Nielsen-Bohlman et al., 2004). Besides interactions with the health systems, this knowledge can, for example, also be applied to one's diet, physical exercise regimen and sleeping patterns in order to maintain good health. The term for one's knowledge and skills related to health is called 'Health Literacy'. The World Health Organization (WHO) uses Nutbeam's definition of the term, who defined health literacy as:

"The cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health" (Nutbeam, 1998, p. 357).

Besides solely going by Nutbeam's definition, in more recent literature the term health literacy is used in a more practical sense. Sørensen et al. (2013) describe it as follows:

"Health literacy concerns the capacities of people to meet the complex demands of health in modern society" (Sørensen et al., 2013, p. 1).

The emphasis on 'complex demands for health in modern society' indicates that health literacy does not only concern physical health but encompasses all determinants of health. Therefore, this thesis will use Nutbeam's definition with the perspective of the definition given by Sorensen et al. (2013), thereby putting the meaning of health literacy in the context of health systems. The Economic and Social Council of the United Nations (UN ECOSOC) stressed the importance of health literacy in its Ministerial Declaration in 2009. In this

statement the UN ECOSOC called for the development and implementation of action plans to promote health literacy (United Nations Economic and Social Council, 2009).

1.1 The case for improving health literacy

A lack of health literacy is associated with lowered adherence to health promotion, interventions or medical treatments (Gebroers et al., 2015). Several studies have shown that low levels of health literacy can be regarded as a risk factor for poor health (Kirsch, Jungeblut, Jenkins, & Kolstad, 2002; Sihota & Lennard, 2004). Further, a report called “Health literacy – The solid facts” published by the WHO in 2013 quotes Barry & Weiss (2007, p.13): “... literacy is a stronger predictor of an individual’s health status than income, employment status, education level, and racial or ethnic group”. The report introduces three major problems related to limited literacy: it significantly affects health, it follows a social gradient and can reinforce existing inequalities, and it is associated with high costs to health systems.

Limited health literacy can lead to higher smoking rates due to underestimation of smoking related risks, higher chance of (work-related) accidents or even disregard for personal hygiene (Kickbusch, Pelikan, Apfel, & Tsouros, 2013; Sørensen et al., 2015). The Health Literacy Study of the European Union (HLS-EU) conducted by Sørensen et al. (2015) indicates that limited health literacy is not only a risk to the individual, but it can also be hazardous to others in their environment or populations where these misconceptions occur. Next to increased vulnerability to health risks, low health literacy has also been found to negatively affect one’s self-assessed health status, which is an important determinant of general health and well-being (Hu et al., 2016; Kickbusch et al., 2013). In terms of benefits of increased health literacy, Taggart et al. (2012) found increased up-take of preventive care, increased levels of diagnosis of diseases and better self-management skills. Another study researched the association between health literacy and cancer-related attitudes, behaviours, and knowledge and found that people with higher health literacy tended to be more critical of gained health knowledge, seeking out various sources to gain a complete picture of the situation. Whereas people with limited health literacy tended to trust their friends and family for information (Morris et al., 2013). This indicates that people with higher health literacy can be more active participants in their own care, instead of following the advice from sources directly.

In order to tackle the problems stemming from limited health literacy, it is important to understand the spread and division of health literacy disparities among population groups. The WHO describes low health literacy levels to be common, and very prevalent globally (Kickbusch et al., 2013). Limited or low health literacy was described in the HLS-EU as a sub-par knowledgeability of health literacy, combining the 'inadequate' and 'problematic' groups in their score, scoring lower than a 7 out of 10 on their survey (Sørensen et al., 2015). Besides this, the spread does not only vary between social classes or cohorts, but also between countries. (Kickbusch et al., 2013). The HLS-EU conducted by Sørensen et al. in 2015 researched and compared the health literacy of general populations of eight European member states. The sample populations were aged 15 and over, and all included one thousand individuals. The results from their surveys were used to calculate a 'health literacy score', which were then linked to levels of health literacy. The study found that at least one in ten (12%) respondents showed insufficient health literacy, and that almost one in two (47%) respondents had limited health literacy (insufficient or problematic) (Sørensen et al., 2015). The distribution of health literacy levels varied between countries, with the national proportion of limited health literacy ranging from 29% in the Netherlands to 62% in Bulgaria. Besides disparities in health literacy score between countries the HLS-EU identified determinants of low health literacy such as monetary hardship, low social status, old age and low education level (Sørensen et al., 2015). Furthermore, the authors state that limited health literacy is an important challenge for health policies and practices across the European Union (EU). The HLS-EU concludes that solving the social disparities in terms of the distributions of health literacy level can be an important step to improve health equality in Europe. Meeting the health literacy needs of the most disenfranchised groups can help reducing health literacy gaps between cohorts and even different social groups, which can consequentially help reduce health inequalities and improve health outcomes within populations.

1.2 Economic consequences of low levels of health literacy

Next to the preventable harm and health inequalities that low levels health illiteracy cause to both individuals and populations, it also carries a significant economic burden on health systems (Rasu, Bawa, Suminski, Snella, & Warady, 2015). This burden stems from increased

hospital or health care service use. This leads to increased health care spending. However, this healthcare expenditure is unnecessary and should therefore be avoided. Eichler et al. (2009) analysed the economic burden of limited health literacy and found that it could be responsible for 3-5% of the total health care costs on health systems in Canada in 2009. The costs range from \$143 to \$7,798 per person (Eichler, Wieser, & Brügger, 2009). Next to this, a study conducted in the United States found that limited health literacy cost about 73 billion US dollars in 1998 (Kickbusch et al., 2013).

Considering the costs of low health literacy, it comes as no surprise that it has been mentioned in the 2010 Agenda for Sustainable Development and has been interwoven into several Sustainable Development Goals (SDGs). Health literacy can be linked to SDG 1 'No Poverty', as reduced poverty will consequently improve health literacy in term by more access to health literacy tools such as the internet. Health literacy also plays a part in SDG 2 'Zero Hunger', as health literate parents understand nutritional benefits of breastfeeding, their general diet and excessive sugar content, which will all promote better health. Quality Education (SGD 4) links directly to the availability of information for everybody, such as sexual and reproductive health knowledge for adolescent girls to shield them better against health risks such as unwanted pregnancy and sexual transmitted infections (World Health Organization, 2016a). Health literacy will besides this also contribute to reduced (health) inequalities (SDG 10), will promote work, industry, innovation, infrastructure and economic growth (SDG 8 and 9) and can ultimately promote global peace and justice and the strength of institutions (SDG 16) (World Health Organization, 2016a). All these factors will promote the sustainability of economies and thus health systems worldwide (World Health Organization, 2016b).

In the report published by the European Commission (EC) the effects of Ageing on the economic and budgetary projections of 2016-2017 for the 28 Member States (MSs) were discussed (European Commission & Directorate-General for Economic and Financial Affairs, 2018). The impacts of the ageing EU population and other non-demographic drivers of healthcare expenditures will test the long-term sustainability of public finances. It is therefore necessary to strive for more and increasingly sustainable healthcare finances and health systems. Because of these future challenges, it is important to find areas of improvement

within health systems. With the motivation to reduce health service use to decrease health care expenditure, this study will investigate the cost-saving potential of health literacy-based disease management or disease prevention.

1.3 Health literacy interventions

Public health interventions can unintentionally be health literacy interventions, as they can improve the health literacy of patients without it being the main goal. For example, interventions can be evaluated by the effectiveness of the health education given in health outcomes, but not in health literacy score. In order to talk about these interventions, the thesis needs to be clear about what interventions can be included. There are two categories of interventions that aim to reduce the gaps in low health literacy: single strategy interventions and mixed interventions (Sheridan et al., 2011). Even though these interventions are structured differently in terms of approach and methodology, they still aim largely for the increase of knowledge comprehension, knowledge gained, self-efficacy, use of healthcare services, skills, and the accuracy of one's risk perception (Sheridan et al., 2011). These interventions can aim to improve different aspects of the participants' health literacy. They can aim to increase the participants' motivation to process information or existing health policies (critical health literacy), addressing the problem of low health literacy through traditional education (functional health literacy), change in physician behaviour or practice structure(s) (interactive health literacy) (Sheridan et al., 2011). Interventions can achieve these aims by targeting the determinants of health literacy. These determinants range from the health systems itself, the health context where the individual lives, works and acts in, to the education system they were taught by (Nielsen-Bohlman et al., 2004).

In order to address the issue of limited health illiteracy, educational interventions are needed to appropriately communicate health knowledge to the population. Thereby reducing the amount of people who fail to adhere to medical advice or health promotion (Miller, 2016). These interventions can include a wide range of strategies: self-management programs for patients with chronic diseases, health promotion campaigns, changes in health knowledge communication (use of alternative media or document design, adjustment of doctor-patient interaction' and Online (eHealth) knowledge platforms (Berkman et al., 2011; Park, Rodgers,

& Stemmler, 2013). Health literacy interventions do not solely focus on increasing health literacy levels, but they can also aim on improving self-management skills in patients or spreading awareness of certain behavioural risks that are detrimental to health.

1.4 Economic evaluations

As these programs do not always prove to be effective (or cost-effective) it is important to know the general Cost-Effectiveness (CE), Cost-Benefit (CB), Return On Investment (ROI) and Social Return On Investment (SROI) for these kinds of interventions (Visscher et al., 2018). This data can also help decision makers, politicians and health professionals in deciding which interventions should have priority over others and which interventions can help best in what situation. With a variety of interventions to choose from, health professionals will need to base their decisions on evidence available to them. Economic evidence can be presented in various forms, of which; CE, CB, ROI and SROI analyses, are often used as they clearly depict whether the investment in an intervention will be cost-effective or brings return on its investment, these are explained in table 1 (Botchkarev & Andru, 2011).

Cost-effectiveness (CE) analysis	Analyses relate the costs of the intervention/program to its main outcomes or benefits (in natural units), usually put in costs per quality adjusted life years (QALY) gained attributable to the intervention/program (Cellini & Kee, 2015).
Cost-benefit analysis	A systematic approach to determine the net benefits of the intervention/program by setting out the benefits out over the costs, assigning monetary values to both (Boardman, Greenberg, Vining, & Weimer, 2018).
Return on investment (ROI)	Calculates the gains or losses generated from an investment made relative to the amount of money invested. Similar to the Cost-benefit analysis, the outcome of this analyses is the

	ratio of economic benefits over the costs (Masters, Anwar, Collins, Cookson, & Capewell, 2017).
Social return on investment (SROI)	The SROI methodology builds on the cost-benefit analysis of the ROI, but accounts for a wider range of variables by measuring social, environmental, economic outcomes by expressing them in monetary values (Laing & Moules, 2017)

1.5 Conceptual model of health literacy

The conceptual model of health literacy (Figure 1) of the HLS-EU, divides the different determinants of health literacy into three categories: social-environmental, personal and situational (Sørensen et al., 2012). Next, it depicts the conceptual model of health literacy. Sørensen et al. (2012) elaborate on this model stating that it contains four types of competencies: *Access, Understand, Appraise* and *Apply*.

- **Access:** “refers to the ability to seek, find and obtain health information” (Sørensen et al., 2012, p. 9);
- **Understand:** “refers to the ability to comprehend the health information that is accessed” (Sørensen et al., 2012, p. 9);
- **Appraise:** “describes the ability to interpret, filter, judge and evaluate the health information that has been accessed” (Sørensen et al., 2012, p. 9);
- **Apply:** “refers to the ability to communicate and use the information to make a decision to maintain and improve health” (Sørensen et al., 2012, p. 9).

Figure 1. Conceptual Model of Health Literacy (Sørensen et al., 2012)

This differentiation of competences involved in health literacy is important to make as they all depend upon different cognitive abilities (Sørensen et al., 2012). Furthermore, these four competences all help the individual to understand and access the different domains within the health sector; healthcare, disease prevention and health promotion. These will be experienced in differently as a patient, participant and citizen respectively as their roles within these systems differ, as their role in this participation varies depending on the situation. Next to illustrating the different roles an individual can have whilst applying health literacy knowledge, it also indicates differences in perspectives on health risks and (sources of) health knowledge between the individual and population (Sørensen et al., 2012). Finally, the model depicts the outcomes of limited health literacy, and their effect on the determinants on health literacy levels by describing the effects on health service use and costs, behaviour and health outcomes, patient participation and empowerment, as well as health equity and sustainability. As the study will use the model for analysis of the costs of health literacy, the consequences depicted of 'Health service use', 'Health costs' and 'Health outcomes' are of special interest. By use of this model, this study will review health literacy interventions through the scope of the conceptual model of health literacy, placed in different dimensions while identifying specific outcomes. The review will frame the identified literature within the health sectors in the centre to see what determinants the interventions tackled, and outcomes of health literacy were set out to improve.

1.6 Levels of health literacy

Nutbeam, whose definition for health literacy published in 1998 is still used by the WHO, differentiates between three different levels of health literacy in: Functional health literacy, interactive health literacy and critical health literacy (Nutbeam, 2000). **Functional health literacy** is described as the outcome of traditional health education based on health risks and how to use services within the health systems. It is usually one sided (top-down approach) and the interventions that improve functional health literacy generally aim at direct benefit to the population, by promoting screening and immunization programs. Examples are patient education and the production of information leaflets. The second level Nutbeam mentions is **interactive health literacy**. It is the result of a specific health education approach that targets the development of individual skills by supporting people and is directed to improve personal capacity to act independently. This manner of health education is based on interaction between the educator(s) and the recipient(s), and the interventions based within this level of health literacy are, for example, school programs. Finally, the third level is called **critical health literacy**, which reflects the development of cognitive and general skills with the aim of supporting personal, social and political actions. This type of health education is generally directed towards the benefits of the population, but also aims for individual benefits. It includes “communication of information, and development of skills which investigate the political feasibility and organizational possibilities of various forms of action to address social, economic and environmental determinants of health” (Nutbeam, 2000; p.265). In order to differentiate the areas of health literacy targeted by the interventions, Nutbeam’s definition of the three levels of health literacy will be used to discuss what concept of health literacy is targeted by the identified interventions in this literature review.

1.7 Knowledge gap

Current literature fails to collate clear evidence for the economic and social return and return of health literacy interventions. The WHO reported that health systems in the US and Canada monitor the costs of health literacy to their health systems and indicated a lack of comparative European data (Kickbusch et al., 2013). With health expenditures increasing annually the pressure on current health budgets to allocate resources wisely is also increasing. Health professionals need to assess the potential of health literacy interventions to reduce health expenditures (The Economist Intelligence Unit, 2011). As current evidence for this

potential scarce, it is important to research both the economic and social returns of health literacy (McDaid, 2016). This study sets out to find whether health literacy interventions are cost-effective and what both the return on investment and social return on investment are for health literacy interventions. This evidence informs policymakers and health professionals of the cost-saving potential of health literacy interventions.

1.8 Research question

The aim of this study is to reveal the evidence on ROI and SROI of health literacy interventions within the WHO EURO Region. The evidence for existing health literacy programs and determinants on social, economic and environmental level (on micro, meso and macro scale) within the WHO EURO Region will be mapped. The economic level will be collated to reveal direct health cost-saving potential stemming from health literacy interventions. On the social level, published evidence for social return on investment will be used to review the value of non-monetary return. Finally, on the environmental level the study will assess the social and economic impact the interventions (can) have on their surroundings, both in local and national health system scale. The research question is formulated accordingly:

- What is the evidence for the economic and social return of health literacy interventions within the WHO EURO Region?

Furthermore, the research sets out the following objectives:

- I. Review the economic return of health literacy interventions within the WHO EURO Region.
- II. Collate the social return of health literacy interventions within the WHO EURO Region
- III. Find what types of health-literacy interventions show greatest return.

2.0 Methodology

A narrative literature review on published peer-reviewed reviews and grey literature was conducted in order to identify the evidence for the economic and social return on investment of health literacy interventions within the WHO EURO Region. In order to fill the knowledge gap and provide evidence to achieve the objectives, the academic databases PubMed and the database of Google Scholar were searched for this review. The search was conducted by using the search strings, a combination of keywords and MeSH terms as outlined in Appendix I. The primary search on PubMed was restricted to peer-reviewed English language review papers reviews, published within the last 10 years (1st January 2009 to 1st of April 2019) and whether the material was based on relevant statistical data within the WHO EURO Region. Besides peer-reviewed literature, Google, Research Gate and WorldCat were used to find grey literature from recognized and established governments, international organisations, and universities. In order to find economic evidence including CE, CB, ROI and SROI analyses, search strings were used on PubMed and variations of keywords used in the search string were used in the search on Google Scholar. The search string used to find published peer-reviewed reviews on PubMed in this review was inspired by the search string from the Health Evidence Network reports 51 and 57 (Dyakova et al., 2017; Rowlands et al., 2018). If material was found that does not meet one or more of the criteria, but still shows to be useful for the review to determine CE or other trends in health literacy interventions, the material will be used as background information or will be included in the discussion. The focus of the WHO European Region (WHO EURO) was decided upon as this will be most relevant for the European Union. The WHO EURO Region consists of 53 countries reaching from the Atlantic to the Pacific Ocean (WHO Regional Office for Europe, 2019). Previous reviews showed that there was limited evidence from the WHO EURO Region, therefore the literature search was expanded to other WHO Regions in order to get a more concrete image on the returns of health literacy interventions (Kickbusch et al., 2013). The focus of the study is the effect of health literacy interventions within the European Union. Further, the results will be presented according to their relevance to each objective. The study will classify the results in level of preventative: primary, secondary or tertiary. Primary prevention is regarded to be any action that aims to prevent disease or injury before it occurs, such as smoking cessation programs. Secondary prevention aims to reduce disease or injury that has already occurred, such as

targeted screening programs for e.g. diabetes type II or cardiovascular disease risk. Tertiary prevention aims to lessen the impact of the occurred injury or disease, this is done by use of self-management programs or even support groups (Institute for Work & Health, 2015).

2.1 Approach

In order to answer the research questions and achieve the study objectives, the literature review used academic evidence and grey literature that either directly mentioned health literacy as the outcome measure or that reviewed economic evidence for health literacy interventions. As these interventions can vary in both methodology and outcome measure, it can be difficult to directly compare them, therefore, this review chose to compare their economic or social return on investment in order to identify potential returns that these interventions have. This study included studies conducted and articles published outside of the WHO Euro Region in order to gather more evidence for the benefits of health literacy interventions, as evidence published within the WHO EURO Region appeared to be scarce. This study builds on literature identified by Masters et al. (2017), whose literature review indicated that both local and national public health interventions are highly cost saving. With health literacy receiving increased recognition within the European discourse, the study sought out to frame the cost-saving potential and beneficial effects that health literacy interventions carry with them. With different interventions, the outcome measures needed to be established for comparison. Both CE and ROI values were used to analyse the direct economic impact stemming from improved health status in participants from the new interventions. SROI was used to gain a perspective on the broader benefits, the interventions had to offer. After the results were gathered, the identified interventions were analysed by the use of conceptual model of health literacy by Sørensen et al. (2015). This was done to get a clear image of what determinants and what outcomes were affected by the interventions. Nutbeam's (2000) classification of health literacy levels was applied in order to discuss whether there should be a focus on one aspect of health literacy or whether the levels should be viewed as inseparable from each other, and does that distinction have practical value. After analysis, this classification was found to be of value when it came to the discussion of the different aspects of health literacy interventions, not to identify errors within them.

3.0 Results

From the 471 identified published articles screened, a total of twelve publications met the screening criteria and the inclusion criteria, this process is depicted in the Prisma chart (Figure 2). Out of twelve included studies, three (25%) were grey literature, while nine studies (75%) were peer-reviewed journal articles. Of the 12 found publications, five discussed the CE of health literacy interventions. Three studies discussed the ROI and the remaining four studies discussed on the SROI of health literacy interventions. Regarding the aims of the studies, five examined the effectiveness and CE of the programs, interventions or intervention methods. Three aimed to calculate the ROI and four set out to provide the SROI of the health literacy programs or interventions.

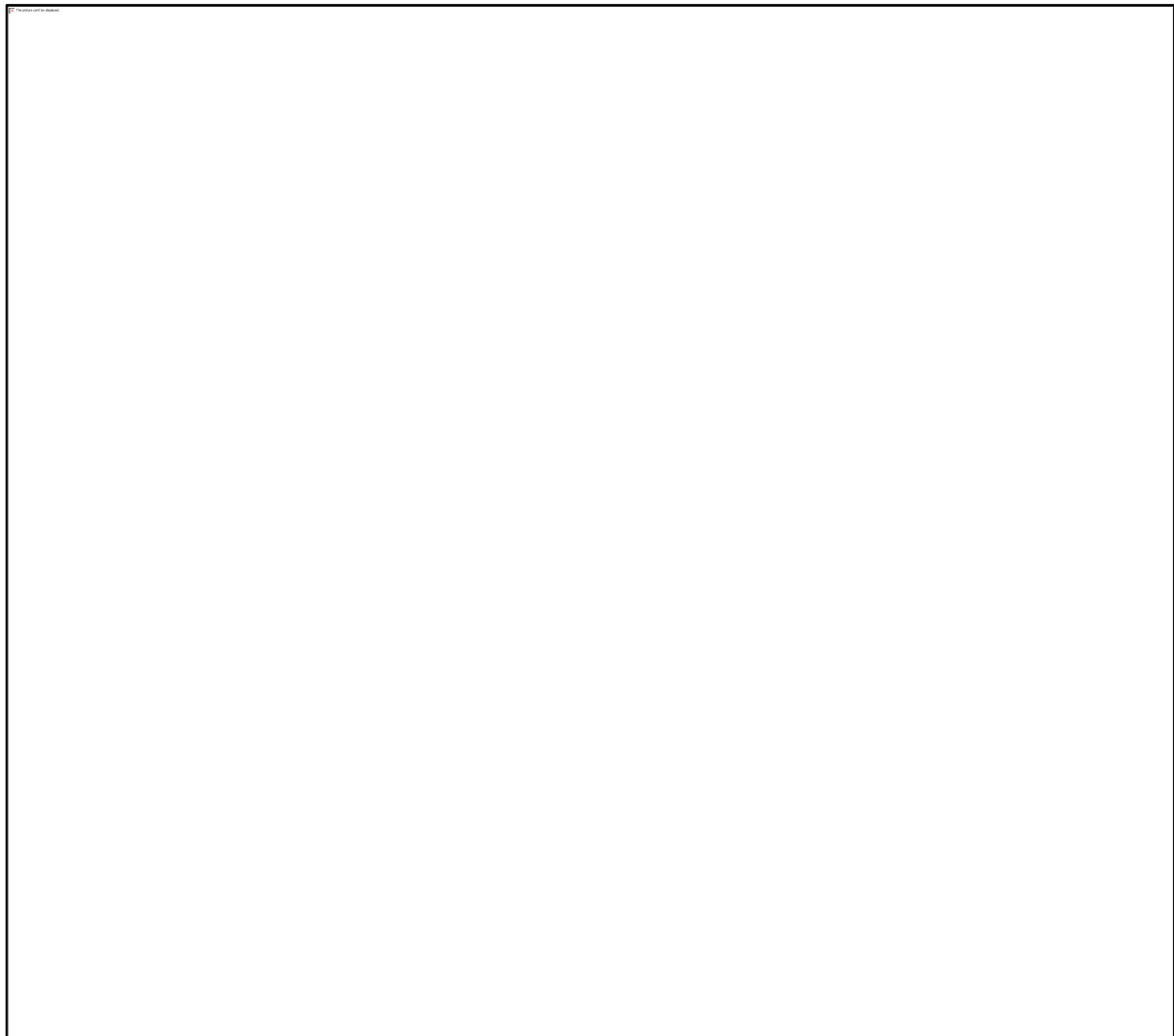


Figure 2: PRISMA chart of search results

The types of health literacy interventions differed between studies. From the twelve studies reviewed, two focussed on health literacy campaigns, two were based on web-based (eHealth) health literacy programs, one was conducted on a prevention system and seven were conducted on education-based interventions. Of the 12 identified studies, only six were conducted within the WHO European Region, all of which were conducted within the United Kingdom. Two studies were carried out in Australia, three studies were conducted in the United States and a single study review from various countries included evidence from different countries. With regard to the time span that the studies set out for the programs or interventions, there was a wide variation in follow-up period between types of interventions. Interventions that targeted the general population in order to promote health behaviours lasted from three months up to a year. Web-based interventions did not seem to adhere to a certain timeframe, as data collection happened up to 15 years after the intervention took place. Furthermore, education-based interventions operated on a wide variety of timeframes, with the time span of these interventions ranging from half a day to several years. Finally, the prevention program lasted for four years. The identified literature was further discussed by their study design in order to compare the findings according to the theories explained in the introduction. In order to discuss the results in a clear order, objectives will be discussed one by one, with the evidence identified through this literature review, the findings will then be discussed in the final chapter.

3.1 Objective I

For objective I "*Review the economic return of health literacy interventions within the WHO EURO Region*" the study found eight articles that contained CE and ROI evaluations, three of which were primary sources and five were secondary sources.

3.1.1 Primary prevention

The studies that evaluated the effectiveness and cost-effectiveness of media campaigns were published in 2010 and 2018, respectively and both were conducted in Australia. Cobiac et al. (2010), measured the outcomes up to five years after the intervention had taken place. However, in Allom et al. (2018), due to the study design, the results were only measurable within the 13 weeks of the intervention itself, due to the fact that it compared different timeslots in those 13 weeks to one another (Allom et al., 2018). Cobiac et al. (2010) evaluated the cost-effectiveness of interventions that promote fruit and vegetable intake that were

aimed at the general healthy population. In order to measure results, the outcome measure of the study selected to be the amount of fruit and vegetables consumed per day, defining one portion as 80 grams (Cobiac, Vos, & Veerman, 2010). The evaluated studies all targeted the same goal but varied greatly in execution. The target populations ranged from the general population to single supermarkets and from health care settings to work sites and low-income areas. Cobiac et al. (2010) found that out of the 23 evaluated studies identified through their search, only 5 were deemed cost-effective. These five interventions' consisted mainly of telephone counselling and follow-ups, information mail-out, community based events, health promotion and dietary counselling (Cobiac et al., 2010). Besides the components that directly target increase or maintenance of health literacy, one of the CE interventions included environmental change in the form of cafeteria changes, and one intervention included sponsorship (Cobiac et al., 2010). The study found that when calculating the cost-effectiveness with a 25% decay of effect per year after the intervention ended, only one intervention remained within the realm of cost-effectiveness. This intervention solely consisted out of information mail out targeted towards the general population. Allom et al. (2018) set out to evaluate the effectiveness the CE of a mass media smoking cessation campaign that operated for 13 weeks (Allom et al., 2018). The research tested what combination of campaigning methods were most effective in which combination, and which were most effective. In order to measure the results, certain 'response events' were selected, these included calls to a smoking cessation phone service, campaign website views and registrations for smoking cessation services (Allom et al., 2018). In the campaign the intervention highlighted the causal effect smoking has on a variety of cancers, which shows people that they should refrain from smoking. Allom et al. (2010) found that online delivery alone was found to be most cost-effective of achieving the nominated response events. The research concluded the next most CE option was any combination of online video and online display, television advertisements were found to be the least cost-effective (Allom et al., 2018).

3.1.2 Secondary Prevention

Kuklinski et al. (2012) conducted a cost-benefit analysis on the Communities That Care (CTC) prevention programme. The CTC programme is a public community wide approach to reducing the prevalence of adolescent health and behavioural problems by reducing risks and

enhancing protection measures. The study based its outcomes on a panel of students followed from grade five through eight in a RCT involving 24 communities in seven different states in the United States (US) (Kuklinski, Briney, Hawkins, & Catalano, 2012). As the outcome measure the study selected the total costs, total benefits and consequentially the cost-benefit ratio as outcome measures. The study found a net present benefit of \$5,250 per youth, and a cost-benefit ratio of \$5.30 per \$1.00 invested and a cost-benefit ratio of \$10.23 under less conservative measurements. This return was broken down further in stakeholder cost-benefit ratios where the participants benefitted \$0.68 to \$1.31, tax payers benefitted \$2.20 to \$4.24 and the general public benefitted \$2.43 to \$4.69 per \$1 US dollar invested in the CTC program. The research concluded that benefits from the CTC's reduction in alcohol initiation as well as broader inclusion of quality-of-life gains would further increase the CTC's cost-benefit ratio. The results provide evidence that CTC is a cost-beneficial prevention system, and is therefore a preventive intervention well-worth the public investments, even under very conservative cost-benefit assumptions (Kuklinski et al., 2012).

A study by Zhang et al. published in 2018 conducted a systematic review of economic evidence on community hypertension interventions. The study analysed cost-benefit, cost-effectiveness, cost-utility and budget impact analyses. 25 out of 34 articles found were educational interventions. In the United States, 31.3% of the found educational interventions were cost-effective, with \$62 as the mean cost per participant per 1mmHg reduction in systolic blood pressure and \$13,986 per life year gained (44). From the studies outside the United States, the mean costs range between \$0.62 (China) and \$29 (Pakistan) for 1 mmHg reduction in systolic blood pressure. The authors conclude that community-based interventions. Targeting health behaviour change and medication adherence, were considered to be cost-effective. Next to this, the study found that these interventions had a high potential to reduce healthcare expenditure in the future.

3.1.3 Tertiary prevention

With regard to tertiary prevention, four educational programs were found: two eHealth interventions and two regular programs (non-eHealth). Three studies (Davies et al., 2017; Murray et al., 2018; Tate, Finkelstein, Khavjou, & Gustafson, 2009) were footed in the UK and one study (Hsu, Wilhelm, Lewis, & Herman, 2016) was conducted in the US.

Two web-based interventions were identified. Tate et al. (2009) searched for evidence on cost-effectiveness of internet interventions. Murray et al. (2018) aimed to develop, evaluate and implement a web-based self-management programme for people with type 2 diabetes mellitus (T2DM) in the UK, with a goal of improving access to, and uptake of, self-management support. Tate et al. (2009) analysed web-based health promotion interventions that were based on, or included, health education. This review included studies that presented cost-effectiveness analysis, cost-benefit analysis and return on investment of the health promotion interventions. Eight articles reported selected economic analyses associated with internet-based interventions, many lacked a comprehensive analysis. The evidence for ROI in the studies was found to be \$1.9 per \$1 invested for a multi-component worksite health promotion program and \$2.13/\$1 invested of the internet-based cardiac rehabilitation program, respectively (Tate et al., 2009). The paper concluded that there is a clear lack of (comprehensive) publications on economic analyses of web-based interventions. The authors mentioned that these interventions are still in their early phases. Despite this lack homogeneous literature, a link between internet-based education interventions and cost-effectiveness was established, showing potential as a cost-saving measure for health literacy education in the future (Tate et al., 2009). Murray et al. (2018) evaluated a web-based T2DM self-management programme. The programme called Healthy Living for People with Type 2 Diabetes (HeLP-Diabetes) comprised of five different work packages (WPs). All WPs had different functions: WP A and WP B determined the patient's (WP A) and healthcare provider's (HCPs) (WP B) requirements respectively. WP C developed, and user tested the HeLP-Diabetes programme. WP D was an individually randomised control trial (RCT) with a health economic analysis. WP E used a mixed methods approach and a case-study design to study the potential for implementing the HeLP-Diabetes programme within routine NHS practice. The relevant outcome measurements for this analysis stemmed from the results of WP D and E. The outcome measures were glycated haemoglobin (Hb1Ac) and diabetes mellitus-related distress for WP D and the implementation outcomes for WP E. The authors found that the incremental intervention costs were lower for the intervention group compared to the control group (-£111 with a 95% confidence interval (CI)). Besides lower costs, the results also reported an increase in quality-adjusted life-years (QALYs) of 0.02 (95%

CI). After analysis of the results of WP E, the authors concluded that the HeLP-Diabetes programme is an effective self-management support programme that is implementable in primary care settings.

Davies et al. (2017) set out to establish whether or not a structured education programme targeting lifestyle and behaviour change was clinically effective and cost-effective at preventing progression of T2DM in pre-diabetics. The study combined targeted screening with a randomised control trial, after the intervention the study had a three-year follow-up period to acquire further data from participants. The study invited 17,972 potential participants from 44 practices across Leicestershire in central England after screening. From the screened group, only 3,449 (19.2%) attended. From the attended only 880 (25.5% of the attended) were found to be pre-diabetics. The study found a non-significant reduced risk of T2DM of 26% in the intervention group compared to the control group that was given standard care. Next, there were significant improvements in Hb1Ac concentrations, low-density lipoprotein cholesterol levels, psychological well-being, sedentary time and step count in the intervention group. After the three-year follow-up, an incremental net gain of 0.046 QALYs was found at a cost of £138 per participant, that yielded an incremental cost-effectiveness ratio of £3643 per QALY, with 86% likelihood of being cost-effective at a willingness-to-pay threshold of £20,000 per QALY. The authors concluded that cost-effective low-resource programs can result in a reduction of T2DM and can improve both the physical and mental health.

Hsu et al. (2016) is a study by the National Centre for Environmental Health as part of the CDC, reviewed the evidence for economic outcomes reported for intensive outpatient Asthma Self-Management Education (AS-ME) or home-based intervention programs for asthma in the United States. The research found nine articles on outpatient AS-ME and 17 publications on home-based interventions that included ROI analyses. The study found that most programs were associated with a positive ROI, but they also indicate that this finding is limited due to a lack of heterogeneous ROI calculations, The ROIs reported differed greatly and ranged from \$0.62 to \$27.4 per \$1 invested. Nonetheless, the authors concluded that US-based outpatient AS-ME and home-based asthma interventions appear to be a sustainable

alternative to standard practice health interventions. Finally, the study indicates that more research is required in order to maximize the program effectiveness, economic sustainability and the economic benefit.

3.2 Objective II

For objective II “*Collate the social return of health literacy interventions within the WHO EURO Region*” four studies were found that all discussed social benefits and contained SROI-analysis. The only identified literature that contained SROI analyses were education-based programs. All of the found articles used for objective II were primary sources.

3.2.1 Primary prevention

A study conducted by a research group at the University of West England (UWE) in Bristol from Jones et al. was published in 2016. The study aimed to evaluate the impact of the Food-For-Life (FFL) programme in local authority areas. FFL seeks to promote a good ‘food culture’ through supporting practical delivery and influencing public decision making. The intervention was delivered in all grant-maintained schools where the program was taken up in the curriculum and the programme was aimed towards students, staff, teachers and even parents. The outcome measures were extensive and included improved behaviour and curriculum developments linked to local issues. The study was based on two case studies, which together provided a SROI of £4.41 of social value generated for every £1 invested (Jones et al., 2016).

3.2.2 Secondary prevention

Clifford et al. (2015) is another study carried out by a research team at the UWE in Bristol. The research set out to evaluate the impact of the “Living Well, Taking Control” (LWTC) T2DM prevention and management programme on the lives of those involved. The study also aimed to calculate the value of expected and unexpected changes created by the project. The target audience of the project were pre-diabetics and the intervention itself existed of self-management education combined with the encouragement for goal setting at each of the weekly group sessions where their progress in these goals was reviewed. The outcome measures included (a healthier) diet, increased physical activity and consequentially weight loss, improved health and social networks and ultimately decreased risk for developing T2DM.

The study found that the approximate value of the social return from the LWTC T2DM prevention programme was £5.80 for every £1 invested. After a sensitivity analysis, the study found that the SROI for every pound invested lied between £1.30 and £6.57. The authors concluded that the LWTC programme showed a significant SROI for the investments made, and that feedback from both the stakeholders and participants indicated a positive impact on creating changes for the participants.

3.2.3 Tertiary prevention

A report by Robin Brady called 'Value for Money in Arthritis Care's Training Courses' got published by Arthritis Care in 2011. The report examines the value for money generated for the participants of 15 training courses delivered by Arthritis Care in Northern Ireland in 2010. The training courses of the Arthritis Care's Self-Management Training Programme (ACSMTP) consisted of eight different programmes ranging from concise workshops to full courses, some of which were tailored to specific audiences, such as children or young people. As outcome measures Brady (2011) focussed on improved health condition, better self-management of pain and improved social life. Results from the ACSMTP were analysed and projected over five years and the study calculated that the program had generated a SROI of £7.25 for every pound invested. The study mentions that the results are in line with other SROI evaluations conducted in the UK and suggests that the value being created by the ACSMTP in Northern Ireland is similar to the social benefit being generated by other agencies in the UK. Brady, however, failed to provide evidence to support these claims. The report states that most value is generated through improved health conditions through a better diet, followed by the increased ability to self-manage pain and finally improved social life (Brady, 2011).

Kennedy and Philips (2011) used SROI methodology to evaluate the social impact of the Expert Patient Programme (EPP) for substance and alcohol misuse in the UK. The EPP was based on group-based workshops and aimed to improve the quality of life for people with long-term health conditions by teaching self-management skills and stimulating self-confidence. This will in turn improve the participant's motivation to take control over their illness and take back their lives. The selected outcome measures included improved diet and mental health, increased self-awareness and self-worth. Next to this the participant's social circle would also

be expanded by meeting new like-minded people, which adds to the social return. The authors found that self-confidence itself was the most important direct outcome for the participants. Important indicators for personal change were improved relationships, participation in volunteering work and the chasing of educational and employment opportunities. The study concluded that the SROI was £6.09 for every £1 invested, which appeared to be robust in the sensitivity analysis.

3.3 Objective III

For objective III “*Find what types of health-literacy interventions show greatest return*” The literature included in this review presented ROIs ranging between \$0.62 and \$27.4 per \$1 invested regarding intensive outpatient asthma self-management (tertiary prevention level intervention) (Hsu et al., 2016). The web-based intervention that was the subject of an ROI analyses presented a ROI of £1.9 per £1 invested (Tate et al., 2009), which is a primary prevention level intervention. The studies that presented SROI programs all presented SROI values between £4.41 up to £7.25 per £1 invested (Brady, 2011; Clifford et al., 2015; Jones et al., 2016; Kennedy & Phillips, 2011). All these studies covered education-based interventions on different levels of prevention. The studies in tertiary level prevention showed the highest social returns (£6.09 and £7.25 respectively) (Brady, 2011; Kennedy & Phillips, 2011).

3.4 Application of the conceptual model of health literacy

The application of the framework starts off with the determinants of health literacy flowing into the process of gaining and applying health information. This process is framed towards different sectors of its application, and finally it considers the effects of health literacy on the selected outcomes. Since health literacy interventions aim to prevent accidents, preventable diseases or further progression of diseases like diabetes or arthritis, the study categorised the results according to their level of disease prevention. In order to stick to this method, the application of the framework will solely focus on the sphere of disease prevention.

Beginning with identified studies focussing on health campaigns, Allom et al. (2018) and Cobiac et al. (2010) were both conducted at a population level. Allom et al. (2018) studied the cost-effectiveness of multiple advertising or communication methods in order to convey a public health message, which they tested with a smoking cessation campaign. The campaign

warned about the side effects of smoking, stimulating the recipients' personal knowledge on why not to smoke, thereby targeting their **personal determinants** on population level (Allom et al., 2018). Cobiac et al. (2010) evaluated the effectiveness of fruit and vegetable intake, focussing on interventions targeting various levels of the population. Of the 23 analysed interventions, only five were found to be cost-effective, these interventions used a multi-component approach that not only targeted the individual but held community events and engaged more with the individual than just spreading the message to a wider audience. The cost-effective interventions were estimated to have an effect decay of 25% per year and further analysis led to the conclusion that only information mail out would be cost effective after a single year of the campaign ending (Cobiac et al., 2010). From these five interventions, it can be noted that in the right circumstances, targeting **social and environmental determinants** can potentially be more effective and cost-effective. But that a low-cost long-term strategy that only targets the individual's knowledge, or other **personal determinants** was found to be sustainable.

The identified web-based interventions aimed to educate participants about their disease and help them in self-manage their disease or help them recover from it. The self-management program for people with T2DM was aimed towards the needs of the patient and healthcare provider, thereby targeting the personal determinants and possibly social or environmental determinants (Murray et al., 2018). Tate et al. (2009) analysed the cost-effectiveness of internet-based interventions, two studies with elaborate economic analyses were identified. A multi-component worksite health promotion program included an internet web portal for information combined with face-to-face workshops and printed materials. The other study was a web-based cardiac rehabilitation program that aimed to educate people, it included a website for information and self-testing the participant's knowledge (Tate et al., 2009). Both studies focussed primarily on **personal knowledge** and therefore focus on **personal determinants**. An economic evaluation of a health literacy-based prevention system was found. The study conducted a cost-benefit analysis of the Communities That Care (CTC). The analysis selected outcomes from a follow-up panel from grade five through grade 8 in a RCT in 24 different communities in seven states in the USA (Kuklinski et al., 2012). This prevention system based on health literacy score within a certain cohort allows for identification of

educational or informational needs that has shown to reduce harm to health and the community, considering the different cost-benefit ratios as there has been no specific SROI carried out. Programs like the CTC allow for detection of personal knowledge or health literacy gaps, to which the local educational board or school can act. Thereby focussing on identification of **personal determinants**, and then aiding these factors by use of **social** or **environmental change**. Although the identified educational interventions varied from target group, aim (relieve, self-management, better health etc.) or even aspect of disease, they all shared the common goal of increasing self-management or teaching the participants valuable life-long skills (Brady, 2011; Clifford et al., 2015; Davies et al., 2017; Hsu et al., 2016; Jones et al., 2016; Kennedy & Phillips, 2011; Zhang, Wang, & Joo, 2017). These will empower them as patients but will also have an impact on their social lives as they are more independent from health services. From the educational interventions identified in this search, all seven focussed on improving personal health literacy determinants, three focussed on improving social circumstances for participants by bringing them in touch with patients with similar disease patterns (Brady, 2011; Kennedy & Phillips, 2011; Zhang et al., 2017). Two interventions were identified that set out to modify **environmental and social determinants** of health literacy (Hsu et al., 2016; Jones et al., 2016; Zhang et al., 2017).

4.0 Discussion

The conceptual model of health literacy by Sørensen et al. (2015) was applied to discuss the tackled determinants of health literacy and expected outcomes of the identified interventions. To discuss the benefits of the health literacy interventions, the study separated the findings into economic and social outcomes. The major factors contributing to the benefit or cost-saving potential will be identified and categorised by use of the three levels of health literacy as proposed by Nutbeam (2000) to evaluate which level yields most economic or social potential. Further, the study will assess itself, identifying strengths and weaknesses of its methodology and assessing its limitations. Recommendations for future research and key messages will be provided at the end of the discussion.

After discussion of the results, it has become clear that the identified literature mainly focusses on changing personal and social-environmental determinants of health literacy, such as the education system, personal knowledge and understanding of diseases or lifestyle patterns such as certain behaviours or diets. These findings show that there is an opportunity to address and look at situational determinants, such as interventions focussing on peer influence, the family as a whole or even the use of media to improve health literacy (Sørensen et al., 2012). The outcomes of the conceptual model of health literacy that were targeted most often by the health literacy interventions were found to be health behaviour and health outcomes. As the outcome measures of several identified articles focus on behavioural improvement and consequentially health outcomes (Allom et al., 2018; Brady, 2011; Clifford et al., 2015; Davies et al., 2017; Jones et al., 2016; Kennedy & Phillips, 2011; Kuklinski et al., 2012; Zhang et al., 2017). Besides this, health cost suppression was mentioned in almost all cases even though it was not the main outcome measure for the interventions. Furthermore, several articles discussed the effects of health literacy on health service use and health costs (Allom et al., 2018; Brady, 2011; Davies et al., 2017; Hsu et al., 2016; Jones et al., 2016; Kennedy & Phillips, 2011; Murray et al., 2018; Tate et al., 2009). Finally, other outcome measures such as patient participation and empowerment, health equity and sustainability were often part of the discussion, however they were not the focus of the review.

4.2 Returns of health literacy interventions

This study has collated evidence for both CE and positive ROI or SROI of health literacy interventions. The data on CE and (S)ROI was mixed, as several reviews presented both positive and negative returns of health literacy interventions, these studies explain this by stating that specific requirements should be met in order to achieve CE or acquire a positive ROI or SROI from the interventions (Hsu et al., 2016; Zhang et al., 2017). These requirements can range from specific target audiences to fitting methods depending on the targeted problem. This has also been established in a systematic review conducted by Visscher et al. (2018), who set out to study the effectiveness of health literacy interventions within the EU. The authors conclude that the most promising interventions were tailored to the needs and general literacy of the patients and participants, and addressed all three levels of health literacy (functional, interactive and critical) (Visscher et al., 2018). Next to this, the findings indicate that specific outreach methods in order to target certain audiences for health campaigns are more successful than others, and that certain combinations of communication strategies are more cost-effective than alternative options (Allom et al., 2018; Cobiac et al., 2010). This also correlates with the findings from Visscher et al. (2018), as the outreach method will have a determining effect on the effectivity of the interventions.

When considering the economic returns of the included health literacy interventions, the results are clear. The economic benefit can stem from the interventions by reducing health service use by helping participants to self-manage their disease, prevent progression of their condition or even serve as an alternative for usual care (Brady, 2011; Davies et al., 2017; Hsu et al., 2016). The social benefit resulting from these interventions were established in the form of increased self-managing skills of disease complications such as pain, increased social activity and participation, increased mental and physical well-being and increased self-confidence (Brady, 2011; Clifford et al., 2015; Davies et al., 2017; Jones et al., 2016; Kennedy & Phillips, 2011). It is important to keep in mind however that the found values for SROI might be subjective and highly dependent on the individual and methodologies used to calculate these values. The evidence for SROI however presents the effects of interventions beyond just the scope of (clinical) health outcomes, and it shows clear evidence for the broader effect that health literacy interventions create and offer to their participants, as the interventions causes a ripple effect. Starting within the participants with increased health literacy,

behaviour or health and ending within the increased social participation and productivity, generating more value than just the direct health benefit. These broader outcomes were also established in a study that assessed the value of a community health programme. Where the authors argued that the benefits of health promotion programmes are not limited to direct economic benefit, but also to the changes and opportunities they bring to the participants (Courtney & Baker, 2017). These interventions attribute to the participant's autonomy within the care process and gave them more benefits than just the health improvement itself. When considering the social benefits, it also needs to be stressed that the social return can vary per group, even within the community where the intervention is held. As demonstrated by Kuklinski et al. (2012), health literacy interventions can benefit the community even more than the participants themselves. This is then a result of reduced health service use and reduced exposure preventable health risks such as smoking and excessive alcohol consumption (Kuklinski et al., 2012).

4.3 Main factors for change in health literacy levels

This review applied Nutbeam's (2000) description of the varying levels of health literacy: functional, interactive and critical. Functional health literacy is considered to be the effect of traditional health education based on risk and use of health system services (Nutbeam, 2000). Interactive health literacy is the result of health education that targets specific skills that can for example be used to self-manage disease or to maintain a healthy lifestyle. Critical health literacy regards the collection of cognitive and general skills necessary to support personal, social or political action (Nutbeam, 2000). As for functional health literacy, Food For Life applied curriculum change in schools to have a better health and nutritional education from primary schools and onwards next to the general food campaigns (Jones et al., 2016). The CTC prevention system described in Kuklinski et al. (2012) assessed the needs of the cohort by a health literacy measure, and then adapted the curriculum accordingly, which can also be seen as part of improvement of functional health literacy. Interactive health literacy entails all interventions that target specific diseases, as it is new knowledge specifically tailored to the recipient in terms of disease or health hazard, Cobiac et al. (2010), Tate et al. (2009), Murray et al. (2018), Zhang et al. (2017), Davies et al. (2017), Hsu et al. (2016), Clifford et al. (2015), Brady. (2011), Kennedy and Philips (2011) can all be considered as health literacy

interventions on the interactive level. Finally, critical health literacy interventions teach specific knowledge to the recipients in order to change, behaviour, interventions such as Jones et al. (2016), Kuklinski et al. (2012), Allom et al. (2018), and Cobiac et al (2010) aim for the improvement on this level. A literature review conducted by Visscher et al. (2018) analysed the effectiveness of health literacy interventions in Europe and they found an overwhelming amount of evidence on functional health literacy interventions. This evidence was, however, very heterogeneous in methodology together with low evidence-strength (Visscher et al., 2018). The study concluded that the most promising interventions were tailored to the health needs of the participants while addressing all three levels of health literacy interventions. Studies that showed the strongest returns such as Brady (2011) or Jones et al. (2016) were aimed at improving participants' lives, not merely improve their health. Even though Brady (2011) was assigned to interactive health literacy, and Jones et al. (2016) to critical health literacy, they both contained elements that aimed at all three levels of health literacy.

Ultimately, it is necessary to look at the duration of the effects of the interventions are present, in order to assess the cost-effectiveness. In Cobiac et al. (2010) it was established that after one year of operating, the effect of the interventions diminished, and the costs of the interventions accumulated to the point where the interventions were not cost-effective anymore for most of the interventions tackled except for one intervention that consisted solely of information mail-out (Cobiac et al., 2010). This can be attributed to 'information drop-off', meaning that the taught knowledge and skills gradually will fade over time if they are not kept up to date.

4.4 Implications for Europe

As health literacy research within Europe is limited as of yet, it is important to generate more awareness in order to generate a better image of the status of health literacy within Europe and the WHO Euro Region. In order to do this, the main points to be identified and researched are as follows: (1) Research needs to continue where the HLS-EU by Sørensen et al. (2013) left of, measuring the health literacy of the different countries within Europe, this data could then be used in order to complete the next objectives; (2) Once the status quo is known, the costs

stemming from low health literacy can be brought into a picture, these costs could then potentially then serve as a further argument for increased awareness and attention spend on health literacy research and interventions; (3) Once more evidence for the problems stemming from lowered health literacy are published, policy makers and health professionals are expected to be more inclined to promote health literacy as a tool for economic sustainability of health systems, health-equality and general increase of well-being stemming from increased social well-being. This study has shown the cost-saving potential of health literacy interventions, with both direct economic returns and social returns that both benefit the health system in terms of cost-saving, and also bring the participants and patients more benefits than just health outcomes.

4.5 Critical assessment

Making the case for economic and social return of health literacy programmes is difficult as there is a clear lack of academic literature that aims to analyse health literacy interventions, not to mention the lack of economic or social evaluations of these programs. Even though Nutbeam's (1998) definition of health literacy has been very popular since its publication, he stresses that the concept of health literacy is ever evolving, which means that determinants that we include today may not be considered part of health literacy in the future (Nutbeam, 1998, 2000). Before final conclusions can be drawn on ongoing debates within the health literacy discourse, there ought to be a clear agreement on the definition of health literacy, and health literacy interventions (Visscher et al., 2018). As before this happens, small incremental discrepancies between definitions, approach or methodologies can lead to confusion or false discoveries. Due to this limitation the research was not able to solely focus on health literacy within the WHO EURO Region, which led to the use of material published outside of the WHO EURO Region in order to build a case for the economic and social benefits of health literacy interventions.

After discussing the limitations of health literacy research itself, it is also important to look at the methodologies followed in the evidence used for this discussion. As for the articles used to comment on the SROI of health literacy interventions, there were clear limitations, in availability of literature, lack of homogeneity or subjectivity of benefit values. As indicated by

Banke-Thomas et al. (2015), there is a need to establish a comprehensive database in order for more engagement from research, thereby benefitting the methodology of SROI.

4.6 Limitations

Within this study itself there are clear limitations, there is an increased chance of bias due to a sole researcher having conducted it, and the lack of a secondary reviewer. Nor was a quality assessment conducted on the literature that was used in this narrative literature review. As indicated in the critical assessment, research on health literacy is challenging as it is a term that does not cover all research data within its parameters. Therefore, the key words used for the final search may not be perfect. Furthermore, there was a lack of homogeneity in the found literature in terms of methodologies used for ROI and SROI evaluations. Next to this the study used literature covering a wide variety of settings and disease types, which makes the arguments build using the literature weaker than if the study had stayed with a single disease type and had only used literature that focussed on T2DM. Finally, even though the presented results make a promising case for both the economic and social returns of health literacy interventions, a definite answer to this objective remains to be discovered.

4.7 Recommendations for future research

This literature review found that despite the supporting evidence for health literacy, it is important to fill the knowledge gaps left by current research. This study calls for policy makers, health professionals and others alike to expand collaboration efforts to increase and improve upon the attention spend on health literacy interventions and health literacy research. This evidence showed that these interventions are not only successful in saving costs and reducing burden of chronic diseases (Brady, 2011; Clifford et al., 2015; Davies et al., 2017; Murray et al., 2018), but can also be used as a tool for general health promotion, such as demonstrated by Kuklinski et al. (2012). Next, a clear definition for health literacy interventions would assist necessary future efforts of analysing their outcomes. This research is especially necessary within the EU, as there is limited economic evidence for either the costs to e.g. health systems caused by limited or low health literacy, or the benefits from health literacy interventions (Kickbusch et al., 2013). This study expects that efforts to fill these gaps will be established in upcoming projects by Sørensen, Brand and Pelikan, who collaborate on 'Health Literacy in Europe' at Maastricht University.

4.8 Conclusions

Several studies have shown that health literacy interventions are worth investing in, despite uncertainties such as effectiveness drop-off affecting the cost-effectiveness of the interventions (Cobiac et al., 2010). This study has found evidence to support the promotion of health literacy interventions as a measure for cost-suppression within health systems. Benefits of health literacy interventions were measured in the form of increased well-being, increased self-management skills and independence, up to increased social participation and activity. Evidence for positive ROI and SROI was found, however there are indicators that these interventions need to be carefully tailored to their recipients, as Hsu et al. (2016) only found positive ROI when selecting specifically tailored to their recipients. Future research efforts are necessary to increase understanding of health literacy and gain more evidence for the benefits of health literacy interventions. The results from the review proved these programs to be beneficial in every level of disease prevention, especially in preventing disease progression. Finally, in order to reduce healthcare expenditure and reduce unnecessary health service use, it is important for policy makers and public health officials to pay attention to the existing and future publications on health literacy interventions. As this evidence base shows health literacy to be a valuable option in promoting sustainability of health systems.

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Appendix

Search strategy planner				
Identify type of question / problem and create a focussed question. Apply appropriate tools (PICO PICOCS, SPICE, ECLIPSE)				
What is the evidence for the return on investment and the social return on investment for health literacy interventions within the WHO EURO region?				
Identify / separate the main concepts of the question into key words				
Concept 1	Concept 2	Concept 3	Concept 4	Concept 5
Evidence	Return on Investment	Social Return on Investment	Health Literacy	Interventions
Alternatives keywords or concepts				
Effect	Social welfare		Health Literacy	Public health
Outcome	Cost(s)		Health education	Health promotion
Util	Costing		Health knowledge	Primary prevention
Consequenc	Econom		Health attitudes	Health in all policies
Impact	Invest		Health practice	
Evaluat	Financ		Health adj literacy	
Analy	Funding		Health adj knowledge	
	Budget			
	Monetary resource			
	Benefit			
	Return on investment (ROI)			
	Social return on investment (SROI)			
	Win-win			
	Best buy			
	Good buy			
	Value for money			
Search				
PubMed:				
(((“public health” OR “health promotion” OR “primary prevention” OR “health in all policies” OR “social welfare”)) AND ((cost OR costs OR costing OR econom OR invest OR financ OR funding OR budget OR “monetary resource”) AND (benefit OR effect OR outcome OR utilit OR consequenc OR impact OR evaluat OR analy) OR (“return on investment” OR “win-win” OR “best buy” OR “good buy” OR “value for money” OR ROI OR SROI))) AND (health literacy OR (health education OR health knowledge / attitudes / practice OR (health adj literacy OR health adj knowledge))				
→ Review → 10 years → humans → free full text				
450 results on 28-02-2019				

Google Scholar:
Combinations of handpicked key words from the alternatives mentioned above.

Limitations

- Limited amounts of data available
- Keep search terms as broad as possible

Sources

Evidence Based Resources:

Databases: PubMed – Google Scholar

Grey Literature: Reports from international organisations, public health organs and universities.

Inclusion and exclusion criteria:

Inclusion

- Peer-reviewed resources/evidence
- Published in the last 5 years
- Published/ available in the English
- Conducted at population level, specific populations or individual level within the WHO EURO Region
- If it is a health literacy intervention, using president from Visscher et al. (2018)
- Including primary research data due to lack of secondary data sources covering the topic
- Economic analysis

Exclusion

- Studies that focus on literacy (reading ability) instead of health literacy
- Studies about normal reading development (that is or is not brought about by a medical condition e.g. dyslexia).

PRISM chart: adapted from: <http://prisma.thetacollaborative.ca/generator>