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Ageism in Healthcare: a systematic review of operational definitions and inductive conceptualizations

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Abstract

Purpose: International and national bodies have identified tackling ageism in healthcare as an urgent goal. However, health professionals, researchers and policy makers recognize that it is not easy to identity and fight ageism in practice, as the identification of multiple manifestations of ageism is dependent on the way it is defined and operationalized. This article reports on a systematic review of the operational definitions and inductive conceptualizations of ageism in the context of healthcare.

Design and Methods: We reviewed scientific articles published from January 1995 to June 2015 and indexed in the electronic databases Web of Science, PubMed and Cochrane. Electronic searches were complemented with visual scanning of reference lists and hand searching of leading journals in the field of ageing and social gerontology.

Results: The review reveals that the predominant forms of operationalization and inductive conceptualization of ageism in the context of healthcare have neglected some components of ageism, namely the self-directed and implicit components. Furthermore, the instruments used to measure ageism in healthcare have as targets older people in general, not older patients in particular.

Implications: The results have important implications for the advancement of research on this topic, as well as for the development of interventions to fight ageism in practice. There is a need to take into account underexplored forms of operationalization and

inductive conceptualizations of ageism, such as self-directed ageism and implicit ageism. In addition, ageism in healthcare should be measured by using context-specific instruments.

Keywords: ageism; healthcare; systematic review

Introduction

Almost 50 years ago, Robert Butler (1969, p.243) coined the concept of ageism, having then offered the following definition of it: "prejudice by one age group towards other age groups". His work signaled increased societal and research interest in the phenomenon of ageism and strategies to combat it. Initial studies on ageism in healthcare revealed ageist attitudes and practices of professionals (Greene et al., 1986) in the fields of psychology (Gatz & Pearson, 1988), psychiatry (Ray et al., 1985), rehabilitation (Benedict & Ganikos, 1981) and dentistry (Gilbert, 1989), to name just a few. Currently, abundant evidence of ageism in the healthcare domain, as well as in other domains, has accumulated (Levy, 2016). A report by the Economist Intelligence Unit on healthcare strategies for an ageing society, published in 2009, underlined that there is strong evidence of widespread ageism in medical treatment around the world (Economist Intelligence Unit, 2009). This evidence had been previously confirmed by other reports at national level, such as in the United States of America (Alliance for Aging Research, 2003) and the United Kingdom (Roberts, Robinson, & Seymor, 2002).

Ageism in healthcare can be found in social interactions, in organizational cultures and in health policies. In each of these levels of reality, it can assume multiple

manifestations. For example, at the micro level of reality, ageism may be conveyed by conscious or unconscious behaviors and attitudes of healthcare professionals, patients and their relatives, such as ordering fewer diagnostic tests for older patients when compared to young patients, and assuming that communicating with older patients is very frustrating.

Ageist behaviors and attitudes in the context of healthcare are far from innocuous, given that the amount and quality of care requested, delivered, and received is affected by the existence of ageism (Ouchida & Lachs, 2015). A recent study conducted in the United States of America found that "one in 17 [adults over the age of 50 years] experience frequent healthcare discrimination, and this is associated with new or worsened disability by 4 years" (Rogers, Thrasher, Boscardin, & Smith, 2015, p.1413). In the worst scenarios, ageism in healthcare may imply a higher probability of death for older than for younger patients (Grant, Henry, & McNaughton, 2000; Peake, Thompson, Lowe, & Pearson, 2003).

Because of its potential harmful effects, the issue of ageism has gained increasing importance on the political agendas of international and national bodies. In 2010, the General Assembly of the United Nations called upon Member States "to eliminate and address discrimination on the basis of age and gender" (United Nations, 2010, p.3). In 2012, the European Network of Equality Bodies (Equinet) elected tackling ageism as an essential condition to promote active ageing (Equinet, 2011). In the United Kingdom, the Equality Act 2010 made age discrimination illegal, meaning that the National Health Service cannot provide services on the basis of the patients' age, unless there are justified reasons.

However, eradicating ageism from healthcare is not an easy task. Ageist health policies and regulations can be identified easily and be abolished in a relatively short period of time. The same cannot be said in relation to more indirect and subtle forms of ageism, such as unconscious age-based rationing in clinical decisions. These covert forms of ageism are not only difficult to identify but also difficult to change (Dey & Fraser, 2000; Roberts et al., 2002).

Therefore, identifying the multiple manifestations of ageism, including those more surreptitious or invisible, is a fundamental prerequisite to developing interventions and policies to eradicate ageism in healthcare. Nevertheless, in order to identify the full spectrum of ageism manifestations in healthcare one first needs to know how to define and operationalize it. To date, there is no broad consensus on the definition and operationalization of ageism, which results from the negligence with respect to its conceptual aspects (Iversen, Larsen, & Solem, 2009).

This article intends to provide a systematic review of operational definitions and inductive conceptualizations of ageism, which have been used/produced by empirical research on ageism in healthcare. By operational definitions we mean the specific way in which a construct is measured in quantitative studies, referring to the dimensions/components and respective indicators which are defined before data collection (from the construct to data collection). In turn, by inductive conceptualizations we mean the constructs which emerge from an inductive analysis (from data collection to the construct), which is normally conducted in qualitative studies. It is important to underline that we are interested in the way ageism, as a

concept, has been operationalized and inductively conceptualized rather than in the evidence of the phenomenon of ageism. Hence, this systematic review aims to answer the following review questions: How has ageism in healthcare been operationalized in quantitative studies? How has ageism in healthcare been inductively conceptualized in qualitative studies? To the best of our knowledge, no published review with similar objectives exists.

It is our conviction that answers to the aforementioned questions will raise awareness of the need to take into account underexplored forms of operationalization and inductive conceptualizations of ageism. This will enable us to capture the full picture of this phenomenon. In addition to contributing to the advancement of research, a more comprehensive operationalization and inductive conceptualization of ageism in healthcare would put us in a better position to identify and fight it in practice.

There is an expectation that research on ageism, including ageism in healthcare, will increase significantly in the coming years due, in part, to the rapid population ageing (Levy & Macdonald, 2016) and the implementation of a European Concerted Research Action on ageism (http://notoageism.com/). Considering this expectation, in our view, this review is not only necessary but also timely.

Conceptual framework

There are two central concepts in this review that we need to clarify: ageism and healthcare. Regarding ageism, we adopt the extended definition proposed by (blinded for review) that builds on the work of Iversen and colleagues (2009):

> Ageism is defined as negative or positive stereotypes, prejudice and/or discrimination against (or to the advantage of) us on the basis of our chronological age or on the basis of a perception of us as being 'old', 'too old', 'young' or 'too young'. Ageism can be self-directed or other-directed, implicit or explicit and can be expressed on a micro, meso or macro-level.

This definition includes four dimensions, each one with its respective components: the dimension of the three classic components (cognitive-stereotypes, affective-prejudice, behavioral-discrimination); the self-directed/other-directed dimension (self-directed ageism, other-directed ageism); the conscious/unconscious dimension (explicit ageism, implicit ageism); and the positive/negative dimension (positive ageism, negative ageism). From our viewpoint, the micro, meso and macro levels are not dimensions of the phenomenon but rather the levels of reality in which the phenomenon manifests. Combining the four dimensions and respective components of ageism, we obtain a conceptual framework with 24 possibilities of operationalizing ageism (see Table 1). These multiple forms of operationalization also serve to classify the inductive conceptualizations of ageism.

<please, insert Table 1 about here>

Following Abrams, Swift, Lamont and Drury (2015), and Iversen and colleagues (2009), it is important to clarify that the cognitive component refers to "what we think about", accounting for stereotypes (e.g.: holding the assumption that older patients are problematic), whilst the affective component refers to "what we feel about", accounting for prejudice (e.g.: to dislike having conversations with older patients). Finally, the

behavioral component refers to "how we behave towards", accounting for discrimination (e.g.: asking fewer questions to older patients than to younger patients when making a diagnosis). In turn, the self-directed component refers to ageism directed towards people of one's own age or towards oneself (e.g.: assuming that I am too old to receive certain treatments), whereas the other-directed component refers to ageism directed from a person (or persons) towards a person (or persons) of other age groups (e.g.: believing that older patients are always complaining about their health). Looking now at the rows, the explicit component corresponds to conscious ageism (ageist beliefs, feelings and behaviors, which are consciously enacted) and the implicit component corresponds to unconscious ageism (ageist beliefs, feelings and behaviors, which are automatically enacted without conscious awareness). Consciously believing that older patients are always complaining about their health can be an example of explicit ageism, whilst not asking for information about sexual life to older patients can be an example of implicit ageism (a health professional may not be aware of this behavior, based on the assumption, also unconscious, that older people do not have active sexual lives). Finally, the positive component consists of stereotypes, prejudices and discrimination in favor of someone on the basis of age (e.g.: giving priority to older patients when prescribing treatments), whilst the negative component consists of stereotypes, prejudices and discrimination in disfavor of someone on the basis of age (all the other examples offered previously). More illustrations of the different components of ageism can be found in the Appendices 2, 3 and 4, Section A.

With respect to the concept of healthcare, we adopt the following general definition by the World Health Organization (2004, p.28): "Services provided to individuals or communities by health service providers for the purpose of promoting, maintaining, monitoring or restoring health". For the purposes of this review, we exclude long-term

care from this definition, although in some countries long-term care in an integral part of the healthcare system. We based this decision on the findings of a European research project, designated by "Interlinks", that there is a functional differentiation (in terms of services provided, providers, methods, legal frameworks and policies) between health care, social care and long-term care for older people (Billings, Leichsenring, & Wagner, 2013). Therefore, long-term care responses, such as nursing homes, day care centers, "meals on wheels" and other services intended to support activities of daily living (bathing, dressing, toileting, etc.) are excluded from the definition of healthcare adopted in this review.

Methods

This systematic review followed the guidance for undertaking reviews in healthcare provided by the Center for Reviews and Dissemination (CRD) at the University of York (CRD, 2009) and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Moher, Liberati, Tetzlaff, & Altman, 2009).

Inclusion and exclusion criteria

We established the inclusion/exclusion criteria in relation to timespan, language, study focus, study type and publication type. We searched for studies published from 1 January 1995 to 30 June 2015. Our searches date back to 1995, as research on ageism in healthcare barely existed before this date.

We included studies exclusively reported in English, which is the common language of communication amongst the authors of this paper.

Regarding the study focus, we only included studies which meet, cumulatively, the following criteria: to address ageism in healthcare (studies not focused on ageism, and studies focused on ageism, but in long-term care and social care, were excluded); to make an explicit reference to the terms "ageism" or "ageist" (studies making reference only to "age discrimination" and related terms were excluded, as this review intends to systematize the way the specific concept of ageism has been worked in empirical research); and to provide an operational definition of ageism or an inductive conceptualization of ageism (studies offering solely conceptual definitions of ageism, i.e. definitions of the meaning of ageism adopted before data collection, were excluded). These criteria are justified by the aim and questions of this review, as well as the concept of healthcare adopted in this review.

We also only included studies based on empirical research, excluding theoretical studies, opinion articles, policy documents and literature reviews. However, we visually scanned the reference lists of literature reviews with the aim to identify relevant studies.

Finally, in order to ensure quality in the reviewed publications, we only included articles published in peer-reviewed journals.

Search strategy

The electronic databases Web of Science, PubMed and Cochrane were searched in order to find relevant studies. In the Web of Science database we searched in "all databases", selecting the option "basic search" and using the following fields and keywords/specifications: TOPIC: ("ageism" or "ageist") AND TOPIC: ("healthcare" or "health care"); Timespan: 1995-2015. Subsequently, this search was refined by: DOCUMENT TYPES: (ARTICLE OR REVIEW) AND LANGUAGES: (ENGLISH).

In the PubMed database we selected the option “advanced” and used the following fields and keywords/specifications: "ageism"[Title/Abstract] OR "ageist"[Title/Abstract] AND "healthcare"[Title/Abstract] OR "health care"[Title/Abstract] AND "1995/01/01"[Date-Publication]:"2015/06/30"[Date-Publication] AND "english"[Language] AND "journal article"[Publication Type].

Finally, in Cochrane database we also selected the option “advanced search” and used the keywords “ageism” OR “ageist” in the fields “Title, Abstract, and Keywords”. We limited the search by “Publication Year from 1995 to 2015”.

Searches in these electronic databases were complemented with visual scanning of reference lists from literature reviews and articles which met the inclusion criteria. We also conducted a hand search of the following journals on the field of ageing and social gerontology: The Gerontologist, Journal of Aging Studies and European Journal of Ageing.

Selection of the publications

The identified publications were selected according to the PRISMA flow diagram (Moher et al., 2009). All the stages of the selection process were carried out in parallel by two authors of this article, working independently, and any disagreements were resolved by consensus.

<please, insert Figure 1 about here>

Data extraction

All relevant data contained in the reviewed articles were extracted to a data extraction form. We pilot-tested a preliminary version of this form in five randomly selected articles and the form was subsequently refined. The final version of the data extraction form includes the following items: author and date, aims of the study, theoretical underpinnings, conceptual definition of ageism, operational definition of ageism, inductive conceptualization of ageism, and research design and methods of data collection. The process of data extraction was executed in parallel by two authors of this article, working independently, and any disagreements were resolved by consensus.

Systematic reviews which look at the available empirical evidence normally conduct a quality appraisal of the reviewed studies, which is focused on the quality of the results/findings. Considering that, on one hand, our systematic review does not look at findings/results but rather at operational definitions and inductive conceptualizations and that, on the other hand, there is no established methodology for quality appraisal in conceptual or construct reviews, we decided not to undertake a quality appraisal of the reviewed studies. This decision was also taken in other reviews of operational definitions (e.g. Cosco, Prina, Perales, Stephan, & Brayne, 2013; Ozawa & Sripad, 2013).

Data synthesis

The data that were needed to answer the review questions were synthesized by using two approaches: narrative synthesis (Popay, Roberts, & Sowden, 2006) and thematic synthesis (Thomas & Harden 2008). Narrative synthesis "(…) refers to an approach to the systematic review and synthesis of findings from multiple studies that relies

primarily on the use of words and text to summarize and explain the findings of the synthesis. Whilst narrative synthesis can involve the manipulation of statistical data, the defining characteristic is that it adopts a textual approach to the process of synthesis to 'tell the story' of the findings from the included studies." (Popay et al., 2006, p.5). Normally, a narrative synthesis is supported by "tabulation", which consists in organizing and presenting data in tabular form. In turn, thematic synthesis consists, basically, in reducing the extracted data by a process of transforming "free codes" in "descriptive themes" and these themes in more abstract ones, the "analytical themes" (Thomas & Harden 2008).

We started by collecting all the indicators of ageism, both quantitative and qualitative, explicitly reported in the reviewed studies. By indicators of ageism, we mean a cognition, feeling or behavior chosen to measure or capture ageism. Then, these indicators were submitted to four operations. First, they were categorized in facets of ageism, following the basic procedures of thematic synthesis. The facets were categorized by stereotypes, prejudice and discrimination and by the specific themes found within each of these three components (see Appendixes 2, 3 and 4, Section A). Second, all the indicators were classified in terms of the components of ageism described in the conceptual framework section (see Appendixes 2, 3 and 4, Section A). Third, we counted the indicators included in each facet and in each component (see Appendixes 2, 3 and 4, Section B). Finally, on the basis of the last count, we counted the indicators and the studies included in each of the 24 forms of operationalization/inductive conceptualization of ageism, as described in Table 1 (see Tables 2, 3 and 4).

Results

The searches in electronic databases yielded a total of 311 publications. After removing 100 duplicates and adding 15 more articles from searching reference lists, we obtained a total of 226 publications to screen. After applying the inclusion/exclusion criteria to titles and abstracts, 181 publications were excluded. The majority of the screened publications were excluded because they are not based on empirical research. Upon screening the full text publications, eight publications were excluded, chiefly because they do not offer an operational definition of ageism. This means that 37 articles were included in this review (see Figure 1).

Almost all reviewed articles were published after 2000 and most of them after 2010. Due to the inclusion criteria, all of the reviewed studies provide an operational or inductive conceptualization of ageism. In addition, most of them also provide a conceptual definition of ageism, although some only implicitly, and about a quarter do not offer any conceptual definition. It is also worth mentioning that only a minority of the studies make an explicit reference to their theoretical underpinnings (see Appendix 1).

We created three groups of studies in order to organize the presentation of the results: quantitative studies which did not administer validated scales of ageism (21 studies), quantitative studies which administered validated scales of ageism (eight studies), and qualitative studies (eight studies). There are two mixed methods studies, which were incorporated in the group of quantitative studies, given that data analysis followed a clear quantitative logic. From this point onwards, the reviewed studies are referenced by their identification numbers, as described in Appendix 1.

Quantitative studies which did not administer validated scales of ageism

The 50 indicators of ageism, which were used by quantitative studies that did not administer validated scales of ageism, are distributed between 22 facets of ageism. Almost all of these facets account for discrimination (19 out of 22), with only one accounting for stereotypes and beliefs and two accounting for prejudice. Amongst the discrimination facets, those which refer to discrimination in treatment and management (13 out of 19) stand out, with discrimination in prescribing treatments and access to care services/facilities, being the two facets covered by the largest number of indicators and studies. Four facets of discrimination refer to diagnosis, with the facet accounting for discrimination in ordering/performing diagnostic tests/examinations being the one which includes more indicators and studies. Only one facet of discrimination accounts for clinical trials and another one for survival rates (see Appendix 2, Section B).

If we look now at the number of indicators and studies by components of ageism, we verify that there are major imbalances between the attention that each component receives in the literature (see Table 2). Amongst the classic components (cognitive, affective, behavioral), the behavioral component is clearly predominant. Strong contrasts are also found with respect to the self-directed or other-directed components, as well as explicit and implicit components, heavily favoring the other-directed and explicit ones. Regarding the last two components (positive and negative), we find a significant balance, although with a slight predominance of the negative component.

<please, insert Table 2 about here>

Table 2 also shows the number of indicators and studies which are inserted in each of the 24 possible forms of operationalizing ageism. Two main forms of operationalizing ageism emerge as the most predominant, namely "behavioral, other-directed, explicit, negative" and "behavioral, other-directed, explicit, positive". The majority of the other possible forms of operationalization are not covered at all, whereas the remaining ones have between one and two indicators and one and two studies.

Quantitative studies which administered validated scales of ageism

Eight studies administered validated scales of ageism. Most of these studies adopted only one scale, whereas one study adopted two scales and another one three scales. The scales of ageism which were administered were the following: Attitudes Towards Older People Scale (Kogan, 1961), Aging Semantic Differential Scale (Rosencranz & McNevin, 1969), Facts on Aging Quiz (Palmore, 1998), Fraboni Scale of Ageism (Fraboni, Saltstone, & Hughes, 1990), Reactions on Aging Questionnaire (Gething, 1994). All the scales are composed of several statements (with the exception of the Aging Semantic Differential Scale) and use a Likert scale format. It is important to clarify that these scales were not designed to measure ageism towards older persons in the context of healthcare, but rather towards older persons in general (a more detailed characterization of theses scales can be found in Appendix 3, Section C).

We considered each statement of the scales as one indicator of ageism, with the exception of the Aging Semantic Differential Scale, in which each pair of adjectives was considered to have two indicators. The 173 indicators used by the quantitative

studies that administered validated scales of ageism are distributed between 34 facets of ageism. Almost all indicators relate to the facets that account for stereotypes and beliefs (28 out of 34). There are four facets accounting for prejudice and two accounting for discrimination. The great majority of the facets which account for stereotypes and beliefs has older people as targets (24 out of 28), with the exception of four facets which are directed to ageing, old age and the priority given by medical practitioners to older persons. Amongst the facets accounting for stereotypes and beliefs about older people, the one focused on interaction style and mood stands out, as it is covered by a significant number of indicators and by all studies (see Appendix 3, Section B).

We also found significant imbalances in the distribution of the indicators by components of ageism (see Table 3). The cognitive and affective components are covered by the same number of studies but the cognitive component includes much more indicators than the affective component. The behavioral component is covered only by five indicators and one study. In turn, the other-directed component is clearly predominant when compared to the self-directed component. The explicit component is covered by all the indicators and by all the studies, contrasting clearly with the implicit component, which was not covered at all. The absence of indicators and studies in the implicit component is not surprising, as all of the aforementioned scales were developed to measure explicit forms of ageism. Finally, we find a slight predominance of the negative component when compared with the positive component, as it is covered by more indicators and studies.

<please, insert Table 3 about here>

The studies which administered scales of ageism have employed three major forms of operationalization, namely "cognitive, other-directed, explicit, negative", "affective, other-directed, explicit, negative" and "cognitive, other-directed, explicit, positive" (see Table 3). However, the first operationalization is covered by more than half of all indicators and was used by all studies, whilst the second operationalization includes the same number of studies but with much fewer indicators. The third operationalization was adopted by seven studies, although it has more indicators than the second operationalization. Amongst the other possible forms of operationalization, most of them are not covered by any indicator and study, two have a relatively significant number of indicators but only one study, one has only one indicator and five studies and the remaining ones have five or fewer indicators and only one study.

Qualitative studies

The 18 indicators of ageism which were used by the qualitative studies are distributed between two major facets of ageism, the facets accounting for stereotypes and beliefs about older patients (seven out of 14) and the facets accounting for discrimination in treatment and management (six out of 14). There is one facet accounting for discrimination in diagnosis and another one accounting for discrimination in social interactions in the context of healthcare settings. There is no facet accounting for prejudice. The facets covered by the largest number of indicators and studies are the ones accounting for "stereotypes and beliefs about the older patients: symptoms" and "discrimination in treatment and management: disempowering older patients", although closely followed by the others (see Appendix 4, Section B).

In line with the previous two groups of studies, the qualitative studies also exhibit some imbalances with respect to the distribution of the indicators and studies by components of ageism (see Table 4). The cognitive and behavioral components are covered by nearly the same number of indicators and studies, given that five indicators are duplicated in the cognitive component (one indicator measures both self-directed and other-directed ageism, whilst four indicators measure both explicit and implicit ageism). The affective component is not covered at all. In turn, the other-directed component includes more indicators and studies than the self-directed component. With respect to the explicit and implicit components, the first one is covered by all the indicators and all the studies (in Table 4 it appears 19 indicators, as one indicator is duplicated), whereas the second one has much less indicators and fewer studies. The positive component is not covered at all, contrasting clearly with the negative component, which includes all the indicators and all the studies.

<please, insert Table 4 about here>

Looking now at the inductive conceptualizations of ageism, we find three major conceptualizations: "cognitive, other-directed, explicit, negative", "behavioral, other-directed, explicit, negative" and "cognitive, other-directed, implicit, negative" (see Table 4). We verify that the first two conceptualizations are covered by the same number of indicators but the first one includes one more study. The vast majority of the other possible conceptualizations are not covered by any studies and three conceptualizations have up to two indicators and two studies.

Discussion

This systematic review aims to answer two review questions: How has ageism in healthcare been operationalized in quantitative studies? How has ageism in healthcare been inductively conceptualized in qualitative studies?

We found two main forms of operationalizing ageism in the quantitative studies that did not administer scales of ageism and three main forms of operationalizing ageism in the quantitative studies that administered scales of ageism. If we look at the two groups of quantitative studies as a whole, we can verify that the components of ageism which are completely absent in these five forms of operationalization are the self-directed and the implicit components. This has clear implications for the study of ageism in the context of healthcare, as well as for developing interventions to tackle ageism in practice. With respect to the self-directed ageism in relation to older patients, this component of ageism can assume several manifestations, such as refusing certain diagnostic procedures/tests and certain treatments because of the perception of being "too old", and believing that certain symptoms have to do with "normal ageing" (articles 19 and 28). Not paying due attention to these practices, attitudes and beliefs carries the risk of not capturing the full picture of ageism in healthcare, underestimating its prevalence and perpetuating situations with potential severe consequences for older patients. Furthermore, self-directed ageism tends to be implicit (unconscious), which makes it particularly insidious and harmful (Levy & Banaji, 2002). This justifies the importance of identifying the possible manifestations of self-ageism in the context of health care, so that appropriate interventions can be developed to fight them.

Regarding implicit ageism, it is important to underline that it is insidious (Levy & Banaji 2002) and can assume different manifestations in healthcare, such as believing that older people do not fit in the hospital environment (article 30) and believing that older patients cannot tolerate the same treatment administered to younger patients (article 35). Many ageist practices are rooted in implicit negative stereotypes about older people and old age (Nelson, 2002) and this is also found in the care contexts (Clark, Bennett, Korotchenko, 2009). A review of the literature on ageism and age discrimination in primary and community health care in the United Kingdom concluded that "Age barriers are often implicit rather than explicit so that simply removing age criteria from clinical protocols and guidelines will not necessarily eliminate ageist practices" (Clark et al., 2009). This urges us to take into account the implicit component of ageism in future operationalization and inductive conceptualization of this concept, as we can only effectively tackle ageism in healthcare if we are able to identify and measure their implicit manifestations.

We also verified that the quantitative studies which did not administer scales of ageism neglected the facets of discrimination in diagnosis and clinical trials. Ageism in diagnosis is no less important than ageism in treatment and management, and for this reason the existing negligence of the first facet should be overcome. Concerning clinical trials, international regulatory agencies recommend avoiding arbitrary upper age limits, as the exclusion of older persons from clinical trials implies that health professionals have limited clinical evidence when treating older patients, with obvious risks for the later.

There is one more aspect related to the quantitative studies which used scales of ageism that is important to mention. The indicators (statements) of these scales do not measure ageism directed towards older patients but rather towards older people in general. There are even some statements which are irrelevant to healthcare, such as the following one included in the Attitudes Towards Older People Scale: Most old people would prefer to quit work as soon as pensions or their children can support them (for other examples, please refer to Appendix 3, Section A). In this respect, it is important to recognize that the condition of being an older patient is different from the condition of being an older person, and this leads us to believe that there are stereotypes, prejudices and discriminatory practices specifically related to the condition of being an older patient. Furthermore, considering that there is evidence that some health professionals have positive attitudes towards older people, but exhibit negative attitudes towards older patients (Penner Ludenia, & Mead, 1984), probably the prevalence of ageism would not be the same if we administered a scale of ageism in which the targets were older patients instead of older persons. In our viewpoint, measuring/capturing ageism directed specifically towards older patients in the context of healthcare has two chief advantages. First, it enhances our understanding of the phenomenon of ageism in the particular setting of healthcare. Second, this understanding is essential to develop interventions to tackle ageism specifically tailored to the reality of healthcare, and these tailored interventions are more likely be more effective. For example, we are convinced that interventions to fight ageism in the daily practices of healthcare professionals would be more effective if focused on negative stereotypes and prejudices towards older patients rather than towards older people in general.

With regard to qualitative studies, we found that the self-directed, affective and positive components are absent in the inductive conceptualizations produced. The implications of the inattention devoted to the self-directed component were already addressed. In turn, ignoring aspects of affective and positive ageism also contributes to a partial exploration of ageism in healthcare, mainly with respect to its manifestations and prevalence.

The inductive conceptualizations of ageism offered by qualitative studies include facets of ageism accounting for discrimination but almost exclusively in treatment and management. As we had the opportunity to note, this also happens with respect to the dominant forms of operationalizing ageism found in the quantitative studies that did not administer scales of ageism. The implications are discussed above.

Recommendations for future research

Based on the discussion of the results, priority recommendations for future research on ageism in healthcare can be formulated. First, considering that any operational definition and inductive conceptualization is influenced, at least partially, by the conceptual definition of the phenomenon under study, we recommend that future studies adopt a comprehensive conceptual definition of ageism, like the one provided in this article. As argued by Iversen and colleagues (2009, p.5), "A clear definition may thus be the starting point on the way to achieving a higher degree of reliability and validity in future studies of ageism".

Second, we recommend that future research make efforts to measure and assess stereotypes and prejudices specifically directed towards older patients. If we think of scales or similar instruments, this could be achieved by selecting older patients as the targets of statements containing stereotypes and prejudices.

Third, it would be important that future studies devote special attention to measuring and assessing self-stereotyping, self-prejudice and self-discrimination. This could be done through different research methods and approaches, such as scales and other self-reporting techniques, experimental designs (similar to those adopted by articles 1 and 2), interviews and diaries. In addition to the manifestations and prevalence of self-directed ageism, it would also be important to explore its etiology and consequences.

Fourth, implicit ageism also deserves more attention in future research. However, measuring and assessing this component of ageism is a particularly difficult task, as recognized by Abrams and colleagues (2015) and by the authors of one of the reviewed studies (article 32). One of the instruments that are commonly used to measure implicit ageism is the Implicit Association Test (IAT). However, this instrument has some limitations, as it is unable, for example, to capture how implicit ageism is produced and reproduced through language in daily life (Gendron, Welleford, Inker and White, 2016). In this respect, it is important to underline that we still know little about how implicit biases are manifest in naturally occurring social interactions (Stivers and Majid, 2007). Therefore, one of the main challenges regarding the study of implicit ageism in the context of healthcare, as in other contexts, is to develop research approaches able to capture it in naturally occurring interactions. Videotaping the care encounters is an interesting research approach to achieve this (see Stivers and Majid, 2007), but

participant observation could also be a valid approach, given that it is very powerful in grabbing the finer and the taken for granted aspects of daily practices. Still in relation to implicit ageism, it would also be important to explore in more depth not only its manifestations and prevalence, but also its etiology and consequences.

There are other recommendations that should not be dismissed by future studies, such as discrimination in diagnosis, discrimination in clinical trials and positive ageism.

Strengths and limitations

The inclusion of quantitative and qualitative studies adds comprehensiveness to this review. This comprehensiveness was reinforced by the fact that the electronic searches were complemented with hand searching of leading journals in the field of ageing and social gerontology. Furthermore, the first and second screen, as well as data extraction and synthesis were executed in parallel by two reviewers, thereby decreasing the probability of misinterpretations.

However, we also identify some limitations. In our viewpoint, the main one relates with some subjectivity that may persist in the judgments made by the reviewers. Despite good inter-reviewer agreement, the classification of the indicators in terms of facets and components may continue to suffer from some subjectivity. We recognize another limitation, namely, only scientific articles written in English were included. Finally, despite the care that we have put in the search strategy, some relevant articles may still be missing.

Concluding remarks

There is a significant number of empirical studies that have focused on ageism in healthcare. However, the different forms of operationalization and inductive conceptualization of ageism, which were used/produced by the reviewed studies, are far from covering the many possibilities of operationalizing and inductively conceptualizing this phenomenon. Some operational definitions of ageism have acquired a prominent position in empirical research, but there is still "much ground to explore". The multidimensionality and complexity of the phenomenon, i.e. its multiple components and combinations between components, have not been fully explored. Of particular relevance is the lack of attention to the most surreptitious and insidious forms of ageism, i.e. self-directed ageism and implicit ageism. As long as these forms of ageism continue to be under-studies and poorly understood, their harmful consequences will prevail. Therefore, we need to pay more attention not only to these components of ageism, but also to research approaches which are able to measure/capture them in an appropriate way. We hope that this systematic review and the associated recommendations could contribute to advance research on ageism in healthcare and interventions to fight it.

Appendix A. Supplementary data

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Tables and Figures

Table 1. Multiple possibilities of operationalizing ageism

		Cognitive		Affective		Behavioral	
		Self-Directed	Other-Directed	Self-Directed	Other-Directed	Self-Directed	Other-Directed
Explicit	Positive	1	2	3	4	5	6
	Negative	7	8	9	10	11	12
Implicit	Positive	13	14	15	16	17	18
	Negative	19	20	21	22	23	24

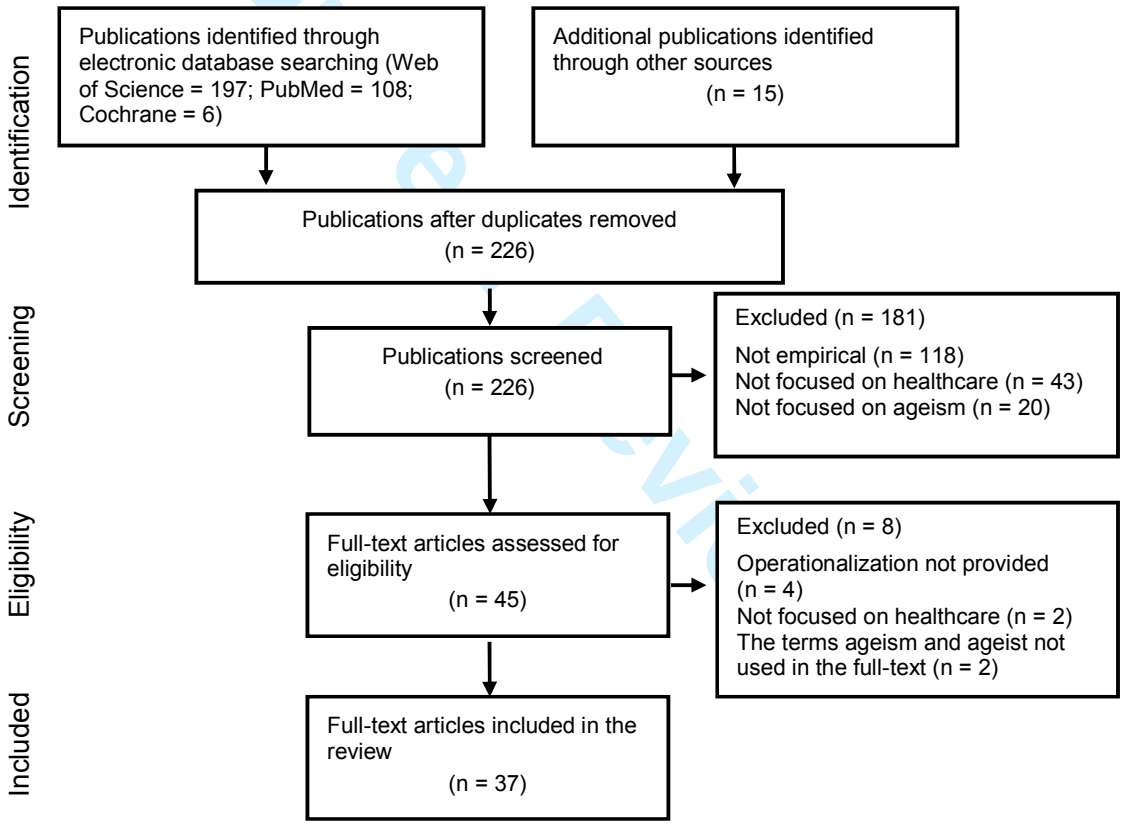

Figure 1. Process of the selection of publications.

Table 2. Number of indicators and studies in each component and operationalization of ageism (quantitative studies which did not administer scales of ageism)

		Cognitive		Affective		Behavioral		No. of indicators	No. of studies
		Self-Directed	Other-Directed	Self-Directed	Other-Directed	Self-Directed	Other-Directed		
Explicit	Positive	0	1 [15]	0	0	0	37 [1; 2; 3; 4; 5; 7; 13; 14; 18; 20; 23; 29; 31; 33; 34]	38	16
	Negative	0	2 [15;23]	1 [23]	1 [23]	0	43 [1; 2; 3; 4; 5; 6; 7; 9; 13; 14; 18; 20; 27; 29; 31; 33; 34; 37]	47	20
Implicit	Positive	0	0	0	0	0	2 [32]	2	1
	Negative	0	0	0	0	0	2 [32]	2	1
No. of	indicators	0	3	1	1	0	45		
No. of	studies	0	2	1	1	0	20		

Notes:

- The numbers between square brackets correspond to the identification numbers of the reviewed studies, which are described in Appendix 1.
- The total number of indicators in the other-directed component (behavioral) is 45, because 39 indicators (37 explicit and two implicit) have the potential to measure both positive and negative ageism.

Table 3. Number of indicators and studies in each component and operationalization of ageism (quantitative studies which administered scales of ageism)

		Cognitive		Affective		Behavioral		No. of indicators	No. of studies
		Self-Directed	Other-Directed	Self-Directed	Other-Directed	Self-Directed	Other-Directed		
Explicit	Positive	2 [12]	37 [10; 11; 12; 21; 25; 26; 36]	0	1 [10; 11; 21; 25; 26; 36]	0	0	40	7
	Negative	8 [12]	90 [10; 11; 12; 21; 24; 25; 26; 36]	12 [12]	18 [10; 11; 12; 21; 24; 25; 26; 36]	0	5 [24]	133	8
Implicit	Positive	0	0	0	0	0	0	0	0
	Negative	0	0	0	0	0	0	0	0
No. of	indicators	10	127	12	19	0	5		
No. of	studies	1	8	1	8	0	1		

Table 4. Number of indicators and studies in each component and inductive conceptualization of ageism (qualitative studies)

		Cognitive		Affective		Behavioral		No. of indicators	No. of studies
		Self-Directed	Other-Directed	Self-Directed	Other-Directed	Self-Directed	Other-Directed		
Explicit	Positive	0	0	0	0	0	0	0	0
	Negative	2 [19; 28]	8 [8; 16; 17; 19; 30; 35]	0	0	1 [8]	8 [8; 17; 19; 22; 35]	19	8
Implicit	Positive	0	0	0	0	0	0	0	0
	Negative	1 [19]	4 [19; 30; 35]	0	0	0	0	5	3
No. of	indicators	3	12	0	0	1	8		
No. of	studies	2	6	0	0	1	5		

Appendices

Appendix 1 – Characterization of the reviewed studies

Author, Date	Aims of the study	Theoretical underpinnings	Conceptual definition of ageism	Operational definition of ageism (quantitative studies)	Inductive conceptualization of ageism (qualitative studies)	Research design and methods of data collection
1- Adams et al. (2006)	"This paper examines the influence of age on primary care doctors' clinical decision-making and the extent to which ageism is present." (p. 304)	Psychological model of clinical decision-making as a classification process	"Direct ageism occurs where policies specifically state that goods and services are unavailable to people of a certain age, thus making it clearly observable and identifiable. Indirect ageism occurs when practitioners' or organisations' ageist attitudes and assumptions inform decision-making and service provision, as when older people are seen as having lower priority than younger people and are therefore less likely to receive the care they need." (p. 305)	Diagnosis: differences between the number of cues considered by doctors for midlife and older patients; the 'age' cue is not equally influential in doctors' decision-making accounts for older and midlife patients; differences in the number of diagnostic inferences considered by doctors for older compared with midlife patients; doctors' use of sophisticated pattern-recognition approaches when making diagnostic decisions is not the same for older and midlife patients Assessing potential outcomes if diagnoses are left untreated: differences between midlife and older patients in doctors' consideration of the potential outcomes of not treating suspected conditions	Not applicable	Mixed, although the analysis follows a quantitative logic (randomized experimental design: selected doctors were shown videotaped vignettes of actors portraying patients with coronary heart disease; during the interviews, doctors gave free-recall accounts of their decision-making; factorial experimental design)

				Determining interventions: differences between midlife and older patients in doctors' citations of health-care system constraints as reasons for non-intervention		
2- Arber et al. (2006)	"(1) To what extent four patient characteristics—gender, age, class and race (singly and in combination)—influence primary care doctors' diagnostic and management decisions for patients presenting with identical symptoms of CHD (coronary heart disease)? (2) Whether there are significant differences between the UK and US in the influence of patient characteristics on primary care doctors' diagnostic and management decisions? (3) Given the risk profiles for CHD by gender,	Not mentioned	Ageism is implicitly associated with age discrimination	Examining the range of actions undertaken by doctors during consultations, each of which can potentially be influenced by patients' social characteristics (gender, age, class and race). The examined actions were: information gathering activities (asking the patient additional questions, undertaking a physical examination, and ordering diagnostic tests); management or treatment decisions (type of prescription given (if any), giving lifestyle or behavioral advice, referral to a specialist, and timing of follow-up visit).	Not applicable	Mixed, although the analysis follows a quantitative logic (randomized experimental design: the doctors viewed video-vignettes of a scripted consultation where the patient presented with standardized symptoms of coronary heart disease (CHD). After viewing the video simulated consultation, the interviewer asked several questions to the doctors related with the diagnostic decision-making and the management of the patient. For each question, the interviewer recorded verbatim the doctor's full response)

	age, class and race, do doctors' diagnostic and management decisions vary in expected directions with these known base rates?" (p.105)					
3- Austin et al. (2013)	"To examine whether age bias exists in physicians' recommendations for physical activity among individuals with arthritis." (p. 222)	The Behavioral Model of Health Services Utilization	Not mentioned	Likelihood of older people (≥ 65 years old) receiving physicians' recommendations for physical activity compared with the middle-aged group (45–64 years old) (p. 222)	Not applicable	Quantitative (random-digit dial telephone survey)
4- Bond et al. (2003)	"To analyse access by age to exercise testing, coronary angiography, revascularisation (percutaneous transluminal coronary angioplasty/stent insertion and coronary artery bypass graft surgery) and receipt of thrombolysis, where indicated, for hospital patients with diagnosed cardiovascular disease" (p. 40).	Not mentioned	In the context of healthcare, the authors refer that "(…) the application of rationing or prioritisation criteria on the grounds of age alone, independent of physiological condition and ability to benefit, can be labelled as ageist". They also clarify that ageism is discriminating against people on grounds of age alone" (making reference to Bowling, 1999).	Differences in diagnostic testing (exercise tolerance testing, referrals for cardiac catheter and angiography) and treatment (revascularization, receipt of thrombolysis) - according to The Canadian Cardiovascular Society and the New York Heart Association – between four age <65; 65-75; 75-80; >80	Not applicable	Quantitative/ observational study (retrospective case note analysis, tracking each case backwards and forwards by 12 months from the patient's date of entry to the study)
5- Bouman and	"The aim of this	Not mentioned	Not mentioned	Differences between middle	Not applicable	Quantitative (a postal

Arcelus (2001)	study is to examine the attitudes and perceived current clinical practice of psychiatrists with regard to taking a sexual history and management of sexual dysfunction of their patients by comparing responses of old age and general psychiatrists." (pp-27-28)			aged men and older patients with respect to taking a sexual history Differences between middle aged men and older patients in referring to sexual therapy and community psychiatric nurse		questionnaire survey) "Two versions of a survey questionnaire containing a case vignette and questions relating to the vignette were devised. One described an 83 year old man with no previous psychiatric history and without any cognitive impairment complaining of low mood for two months (vignette A), the other a 40 year old man with the same complaint (vignette B). The survey questionnaire was anonymous and half of the old age psychiatrists (36) and their matched general counterparts (36) were sent vignette A, whilst the other psychiatrists received vignette B." (p.28)
6- Briggs et al. (2012)	"(...) to gauge whether exclusion of older people was prevalent in research proposals submitted to Dublin teaching hospitals" (p.311)	Not mentioned	Not mentioned	Using arbitrary upper age limits (not justified on medical grounds) to exclude patients from clinical trials	Not applicable	Quantitative (auditing all clinical research proposals submitted to the Research Ethics committee (REC) covering the teaching hospitals attached to Trinity College Dublin (TCD) over a 3 year

						period from July 2008 to July 2011 inclusive)
7- Chambaere et al. (2012)	"1) are there differences in 2007 in the incidence of the various end-of-life decisions across age groups 2) what are the incidence shifts between 1998 and 2007 in the different age groups 3) what is the preceding decision making process and 4) does the formulation and granting of euthanasia requests differ in incidence across age groups." (p.2)	Not mentioned	Not mentioned	In a physician survey, differences by patient age (65 and above) were investigated for: involvement of patients in decision making to intensify pain alleviation	Not applicable	Quantitative (post-mortem survey among physicians certifying a large representative sample of death certificates in 2007)
8 - Clarke et al. (2014)	To identify "to consider (1) perceived sources of, and explanations for, satisfaction and dissatisfaction with primary care physicians and (2) the strategies that older adults with multiple chronic conditions employ to maximize the care they	Butler (1969; Butler (1980); Bytheway (1995); Calasanti, (2003); Calasanti & Slevin, (2006); Nelson (2002).	"Butler (1980) defined ageism as "(1) prejudicial attitudes toward the aged, toward old age, and toward the aging process … (2) discriminatory practices against the elderly … and (3) institutional practices and policies which … perpetuate stereotypic beliefs about the	Not applicable.	Data revealed "six recurring themes across the interviews: (a) thoroughness; (b) gatekeeping; (c) interpersonal skills; (d) constraints of medical appointments; (e) ageism; and (f) strategies for addressing the problems in interactions with physicians" (p. 30).	Qualitative (in-depth semi-structured interviews with 16 men and 19 women aged 73 years or older, with several chronic conditions. These men and women were all patients receiving care from General Practitioners in Canada; Thematic analysis was undertaken).

	receive" (p. 27).		elderly, reduce their opportunities … and undermine their personal dignity" (p. 8)" (p. 28).		Text related with the theme of ageism: One patient complained about the negligence of the doctor: "Doctors are mostly male and they don't pay attention to women anyway … and as you get older they treat you with even less regard … The older you get, it's almost like, "You should be off the face of the earth" … They've got big practices, and old people are a pain in their ass" (p. 33). Patients expressed that "doctors perceived them to be nuisances who were "complaining for nothing" rather than legitimate patients" (p. 33). This led doctors to dismiss the patients complains, rather than to act upon them. "the participants [patients] actively distanced themselves from those older adults who they felt consulted	

					their physicians for frivolous reasons or who conformed to negative stereotypes of elderly patients as invariably frail, dependent, and overly difficult" (page 34). "many of our participants perceived that they were not receiving thorough and comprehensive medical care, including referrals to specialists and full examinations, as a result of the personal failings of their physicians, the constraints of typical medical consultations, and perceived ageism" (p. 34).	
9- Cruz-Jentoft et al. (2013)	"To assess the extent of exclusion of older individuals from ongoing clinical trials regarding type 2 diabetes mellitus." (p. 734)	Not mentioned	Not mentioned	"Proportion of trials excluding individuals using an arbitrary upper age limit or other exclusion criteria that might indirectly cause limited recruitment of older individuals." (p. 734)	Not applicable	Quantitative (information regarding ongoing clinical trials on diabetes mellitus was obtained from the World Health Organization International Clinical Trials Registry Platform on July 31, 2011)

10- Furlan et al (2009)	"To evaluate attitudes towards older patients among nurses caring for individuals with spinal cord injury (SCI), and examine potential determinants of ageist attitudes." (p.674)	Not mentioned	"Negative attitudes, stereotypes and behavioural discrimination based solely on a person's chronological age" (p. 675)	Attitudes Towards Old People scale (Kogan, 1961); The instrument's statements measure explicit stereotypes and prejudices, both positive and negative "Data were analyzed using Fisher's exact test, Mann–Whitney U-test, multivariate linear regression analysis and analysis of variance with Bonferroni's post hoc test." (p.675)	Not applicable	Quantitative (Attitudes Towards Old People scale)
11- Gallagher et al. (2006)	The study will determine: (i) what health-care personnel group (nurses, assistant personnel or porters) possess more negative attitudes towards older adults; (ii) do health-care personnel who work in acute settings have more negative attitudes than personnel from long-terms settings; and (iii) in terms of health-care personnel's demographics, years	Nor mentioned	Ageism is associated with "ageist stereotypes"(p. 274); "ageist misconceptions" (p. 277); "stereotypical perceptions" (p. 278)	Attitudes Towards Old People scale (Kogan, 1961); The instrument's statements measure explicit stereotypes and prejudices, both positive and negative "However, because of heterogeneity of variance, differences were analysed by non-parametric ANOVA ($\chi 2$), post-hoc independent samples, and, due to uneven sample sizes, Mann–Whitney U-tests. Demographic predictor variables were analysed by multiple regression." (p. 275)	Not applicable	Quantitative (Attitudes Towards Old People scale)

	of experience and training, what is associated with negative attitudes?" (p.274)					
12- Gething et al. (2002)	"(…) to determine whether ageism is prevalent among nurses in Australia and the United Kingdom. It also explored whether patterns of stereotyping extended across the two countries." (p. 75)	Hoyer (1997): "(…) ageism is reflected in the view that older people are a burden, contribute little and are largely dependent on the finances of others. Similarly, Smith [1997] added that growing older is widely viewed as being associated with increased dependence, loss of self control, social isolation and disengagement from life" (p. 74).	"The term "ageism" refers to attitudes and stereotypes about a particular age group in society. It refers to generalisations about people who fall into a similar age bracket, with these generalisations widely argued to be negative in regard to older people." (p. 74).	Reactions to Ageing Questionnaire (Gething 1994); The instrument measures beliefs and affective attitudes, positive and negative, towards frailty, tedium and losses in later life Facts about Aging Quiz (Palmore 1977, 1998); The instrument's statements measure right and wrong knowledge about older people and ageing, as well as positive and negative stereotypes about older people Aging Semantic Differential (Rosencranz and McNevin 1969); The instrument measures beliefs, positive and negative, about the level of effective goal orientation, adaptability and energy output of older people (instrumental/ineffective), the level of dependency upon others and personal autonomy (autonomous/dependent) and	Not applicable	Quantitative (Reactions to Ageing Questionnaire; Facts about Aging Quiz; Aging Semantic Differential)

				the level of social interaction (personal acceptability/unacceptability)		
13- Gnavi et al. (2007)	"To investigate which of a wide range of social and clinical factors influence the start of statins treatment in persons with IHD [ischaemic heart disease] in the city of Torino, a population with one of the lowest prescribing rates in Europe" (p. 492)	Not mentioned	Not mentioned	Differences between older patients and younger patients regarding prescription of statins	Not applicable	Quantitative (all 2001/2002 residents in Torino, aged 30–85 years, with a hospital discharge diagnosis of IHD were linked to the regional Database of Drug Prescriptions to identify those persons who, within 3 months after discharge, had been prescribed statins)
14- Grant et al. (2000)	"The objectives of this study were to determine the in-hospital mortality for injured elderly patients, and by analysing key features of their management, to ascertain whether these trauma patients were managed less aggressively than their younger counterparts." (p. 519)	Not mentioned	Not mentioned	Differences by patient age regarding: use of resuscitation room facilities; senior medical staff involvement in treatment; admission to intensive care units; transfers to regional neurosurgical centers; and mortality with increasing age	Not applicable	Quantitative (this prospective study was carried out using data collected by the Scottish Trauma Audit Group; STAG collects data on all injured patients who are admitted for 3 days or more or who die within hospital. Criteria used in the study were those of the Major Trauma Outcome Study)
15- Gunderson et al. (2005)	"(…) to examine the perceptions and	Not mentioned	"Ageism refers to the unfair judging of	The administered attitude instrument (which captures	Not applicable	Quantitative (a survey instrument designed to

	attitudes of rural Florida physicians who routinely provide care for the elderly" (p.168)		elderly adults simply because of their advanced age. It is a systematic discrimination against the fastest growing segment of the population in the United States, those 65 and older (Matteson, 1988). This stereotyping can be so prevalent in society that it is almost invisible, but it can perpetuate negative attitudes that influence behaviours (Reinsch and Tobis, 1991; Grant, 1996; Tomkoviak and Gunderson, 2004)" (p.167)	positive and negative assumptions) contains17 items that were divided into 4 factors: 1) competence regarding health; 2) patient intelligence; 3) uniqueness of the elderly; 4) frustration with ageing		measure the perceptions and attitudes of health care professionals toward 3 different cohorts of elderly people: a nursing home cohort; patients older than 85 years; and elderly patients)
16- Hansen et al. (2015)	"This study is a secondary analysis of semi-structured, face-to-face interviews collected as part of a larger descriptive, exploratory study of older African Americans' strategies for adapting to the challenges of aging"	Not mentioned	"the concept of being made to feel "less than" because of one's age" (p.4)	Not applicable	Theme related with ageism: "The Added Insult of Ageism," referring to how ageism emerged in health care encounters" (p. 6) "Older people tend to be poor and don't hear as well and they [healthcare	Qualitative (semi-structured interviews with 53 adults 55 years or older recruited from an urban senior center in a Northeastern city primarily serving African American; Thematic analysis was undertaken).

	(p. 3).				professionals] may become a little impatient at times with the person" (p. 4) "Participants also identified a sense of being prejudged because of age, especially about health beliefs and the ability to self-manage" (p. 5).	
17- Higgins et al. (2007)	"The aim of the primary study was to explore the attitudes of health care workers in an acute tertiary referral hospital towards older people. The research question guiding the study was: 'What are the attitudes that exemplify excellent and poor care for older people in an acute tertiary referral hospital?' For the purpose of this paper the data from interviews held with nurses	Butler (2005); Stevens (1999); Kearney, Miller, Paul & Smith (2000); Cuddy and Fiske (2002); Foucault (1991).	"the systematic stereotyping and discrimination of a person because they are no longer young or middle-aged" (p. 226)	Not applicable	Themes related with ageism: "Marginalisation and oppression of older people' with a sub-theme, 'if we only had time', that describes the ways in which older people are overtly and covertly marginalised as a group in the acute hospital setting" (p. 230). "Stereotyping the older person' along with the sub-theme, 'Chinese Whispers' (UsingEnglish.com 2006), captures the ways negative stereotypes are perpetrated throughout	Qualitative (in depth interviews with 9 nurses working in large metropolitan teaching hospital in New South Wales, Australia. A thematic analysis was undertaken to analyze the data from the interviews)

	is reported." (p. 228).				the time of older patients' hospitalisation" (p. 230). "the language the nurse uses unconsciously stereotypes the older person; 'oldies in the corner'" (p. 232) Older persons are considered a burden to nurses, as they are perceived to require more work. Care for older people is considered a waste of time, because it is perceived that cure is not a possibility and it is perceived that it is not possible to improve their quality of life. "the inability to get things done on time results in the older patient receiving only the bare essentials of care and attention" (p. 234). "Knowing that older people are less likely to	

					complain allows nurses to provide marginal care" (p. 234)	
18- Hubbard et al. (2003)	"The aim of this study was to determine whether access to critical care in south Wales is related to age" (p. 383)	Not mentioned	Ageism is implicitly associated with age discrimination	Differences by patient age regarding access to critical care Age groups: -55 years, 55–64 years, 65–74 years, 75–84 years and 84 years	Not applicable	Quantitative (Quantitative secondary analysis and Delphi technique)
19- Iliffe et al. (2005)	"(…) to explore obstacles to recognition of and response to dementia in general practice within Europe" (p. 1)	Not mentioned	"Ageism in this context means the negative attributes attached to ageing as degenerative or disabling process, in which memory loss and to a lesser extent functional loss are seen as normal phenomena of low priority when compared to the other demands of daily existence. The early changes of dementia are then attributed to normal ageing, and can be assimilated into everyday life and accommodated by the person with dementia and those around him/her." (p. 3).	Not applicable	"Ageism" and "Stigma" emerged as two factors within the theme "the journey of the person with dementia along the disease process" Indicators of ageism: attribution of the changes of early dementia to normal ageing; ageist attitudes (at the meso level) that give low priority to the health needs of older people; age barriers for referral to neurologists or psychiatrists (p. 3).	Qualitative (a modified focus group methodology)
20- Jerant et al. (2004)	To compare "(…) age related patterns of screening for	Not mentioned	Ageism is associated with: "Ageist health care provider	Differences by patient age regarding the completion of evidence-based colorectal	Not applicable	Quantitative (telephone-administered

	colorectal cancer with those for breast and prostate cancer in persons aged 50 years and older" (p. 481)		perceptions (e.g., prostate cancer is an older man's disease) and practices (e.g., failure to adequately inform older men of the potential drawbacks of PSA screening along with" (p. 485). "Inaccurate provider perceptions regarding the receptiveness of older women to mammography, a form of ageism bias"	cancer screening		questionnaire)
21- Kearney et al. (2000)	What attitudes do oncology healthcare professionals hold towards elderly people?; Do differences exist in attitudes towards elderly people between physicians, nurses and radiographer?; Do clinical experience, gender or education impact on attitudes towards elderly people?	Butler and Lewis (1973) Bytheway and Johnson (1990)	Butler (1973): "(…) a process of systematic stereotyping of, and discrimination against, people because they are old" (p. 599). Bytheway and Johnson (1990): "Ageism generates and reinforces a fear and denigration of the ageing process and legitimises the use of chronological age to mark out classes of people who are systematically denied resources and	Attitudes Towards Old People scale (Kogan, 1961); The instrument's statements measure explicit stereotypes and prejudices, both positive and negative "Analysis of variance techniques were used to compare the various groups. A test for linear trend was used when examining grades of nursing staff." (p. 600)	Not applicable	Quantitative (Attitudes Towards Old People scale)

			opportunities" (p. 599).			
22- Koch and Webb (1996)	The aim of this study was "to listen to the voices of older patients as they described their experiences of being a patient in a care of elderly people ward." (p. 954)	Ageism is viewed as shaped by the biomedical construction of old age	Ageism is mainly associated with negative stereotypes	Not applicable	Themes: Routine geriatric style: "describes the 'conveyor belt' way of organizing care in wards. Patients subjected to this style in the present study felt dominated by the demands of the work timetable, powerless to have any influence on their own care and unable to express their individual needs" (p. 955) " Segregation" (age-based segregation): labelling older adults as "old" "Segregation reinforces the notion that each patient should he treated in the same way and so the two themes of routine geriatric style and segregation are linked" (p. 956)	Qualitative (Heidegger's (1962) existential phenomenology and Gadamer's (1976) philosophical hermeneutics)
23- Kydd et al. (2014)	"To explore the attitudes of nurses and nursing students in Scotland, Sweden	Not mentioned	Not mentioned	Multifactorial Attitudes Questionnaire (Kydd et al. 1999; Kydd and Wild 2013); The section on ageism	Not applicable	Quantitative study (20-item Multifactorial Attitudes Questionnaire)

	and the US towards working with older people" (p. 33)			measures negative assumptions about older people, and negative prejudice towards older people and ageing. Statements to measure ageism: "Older people should have access, if appropriate, to medical and surgical procedures regardless of their age"; "As older people become increasingly old they become more irritable, touchy and unpleasant"; On the whole, communicating with older people can be very frustrating; The thought of being old worries me"		
24- Leung et al. (2011)	"(i) to investigate hospital doctors' attitudes towards older people and (ii) to determine whether factors that were identified in studies on other health professionals (age, gender, cultural background, work experience and social contact) influence hospital doctors' attitudes." (p. 309)	Not mentioned	Ageism is conceptualized as comprising both cognitive and affective components	Fraboni Scale of Ageism (Fraboni et al., 1990); This instrument is organized by three main dimensions: antilocution, discrimination and avoidance. Antilocution refers, essentially, to stereotypes, positive and negative, about older people. Discrimination refers to attitudes, positive and negative, towards social rights and social participation of older people. Avoidance has to do with affective attitudes and behavior, positive and	Not applicable	Quantitative (Fraboni Scale of Ageism)

				negative, with respect to social contact with older people		
25- Lookinland and Anson (1995)	"The purposes of this comparative descriptive study were to (a) describe and compare the attitudes of registered nurses (RNs) and health career work study students (HCS) who work with elderly people in the clinical setting, and (b) determine whether relevant demographic variables of the two groups were related to their attitudes" (p. 47).	"Allport's theory of prejudice proposes that all groups create mechanisms to survive and adapt to their needs" (p. 48). Levin & Levin (1980)	"ageism consists of more than individual negative attitudes toward older people Ageism also suggests a societal categorization, whereby prejudice and discrimination based solely on age pervade the social climate" (p. 48)	The study used Kogan's (1961) Attitudes Toward Old People Scale: The instrument's statements measure explicit stereotypes and prejudices, both positive and negative	Not applicable.	Quantitative: (Kogan's Attitudes Toward Old People Scale; a survey of 82 registered nurses was undertaken; full sample used: 59 nurses).
26- Lui and Wong (2009)	"(…) to determine the attitudes of our house officers (HO), medical officers (MO) and registrars towards the elderly" (p. 125)	Not mentioned	"Negative attitudes lead to ageism, a process of systematic stereotyping of, and discrimination against, people because they are old." (p. 125). "Ageism generates and reinforces a fear of the ageing process and legitimises the use of	Attitudes Towards Old People scale (Kogan, 1961); The instrument's statements measure explicit stereotypes and prejudices, both positive and negative	Not applicable	Quantitative (Attitudes Towards Old People scale)

			chronological age to classify people who may be systematically denied resources and opportunities" (p. 125) In this last quote the authors make reference to Bytheway and Johnson (1990)			
27- Mackay et al. (2004)	"This study prospectively investigated the effects of age and other Parsonnet risk factors on the incidence and outcome of cardiac arrests following open-heart surgery. We also retrospectively studied the effects of age and organ system failure score on the placement of DNAR ['Do Not Attempt Resuscitation'] orders" (p. 67).	Not mentioned	Ageism is implicitly associated with age-based discrimination	1) The proportion of patients aged < 70 years old and the proportion of patients aged ≥ 70 years old, adjusted for risk, for whom cardiopulmonary resuscitation was attempted prior to death; 2) The proportion of patients aged < 70 years old and the proportion of patients aged ≥ 70 years old, adjusted for risk, for whom Do Not Attempt Resuscitation (DNAR) order had been used;	Not applicable	Quantitative: ("Prospective audit of cardiac arrest calls following 6550 consecutive open-heart surgery cases and retrospective audit of all cardiac surgical deaths not preceded by cardiac arrest") (p. 66); Statistical tests were undertaken to compare proportions by age and risk group.
28- Makris et al (2015)	"The objective of this research was to understand the experiences of older adults who report back pain severe	Levy and Banaji (2002); Levy et al. (2014); Butler (1969) These authors are	"By 'ageism' we mean the overt and subtle ways in which older adults may be unfairly assessed and treated by medical providers, e.g.,	Not applicable	Ageism emerged as the theme" Participant-reported beliefs about age-related inevitability of restricting back pain" (dismissing or	Qualitative (semi-structured interviews and focus groups)

	enough to restrict activity, hereafter referred to as restricting back pain." (p. 2)	mentioned with respect to the negative impact of ageism on older adults' physical and psychological health	as physically or mentally disabled or unworthy of treatment, simply because of their advanced age. We know that ageism or negative age stereotypes have been implicated in unfavorable outcomes" (p. 1)		minimizing comments by providers can serve to inform or reinforce older adults' beliefs that back pain is directly related to old age, or perhaps, that providers have nothing more to offer.)	
29- Mitford et al. (2010)	"The purpose of this paper is to compare the incidence, diagnostic groups and hospitalisation of two differing age groups with first-episode psychosis" (p. 1113)	Ageism in health care could be a reflection of ageist attitudes in wider society (Bowling, 2007, Tonks, 1999). "There is a deep-rooted cultural attitude towards ageing, where older people may be seen as incapable and dependent, particularly by the media (Healthcare Commission, 2006 Living Well in Later Life, 2006)." (p. 1116)	Not mentioned	Differences by patient age regarding the access to a range of services appropriate to people with psychosis	Not applicable	Quantitative (a basic data form completed either by the patient's consultant psychiatrist or by "population adjusted clinical epidemiology" staff)
30- Parke and Chappell (2010)	To explore the interactions between older adults'	The social ecological perspective	Not mentioned	Not applicable	Ageism emerges in this study as a by-product of the pressure on	Qualitative (critical ethnographical study)

	experiences and the hospital environment	(Moos, 1979; Stokols, 1992; Stott, 2000)			hospital employees to keep the system moving. This conflict exaggerates inflexibility and disabilities, and reinforces the incorrect notion that all old people in hospital are problematic (they do not fit in the hospital environment)	
31- Peake et al. (2003)	To study age-related differences in the outcomes of lung cancer patients, controlling for case-mix factors, and to study the impact of ageism on lung cancer patients survival	Not mentioned	Ageism is implicitly associated with denying optimal treatment to older people on the basis of age alone	Differences between three age groups (<65, 65–74, 75>) regarding active treatment Differences by patient age regarding the likelihood of dying within 6 months of diagnosis Differences by patient age regarding histological confirmation	Not applicable	Quantitative (questionnaires)
32- Pedersen and Mehlsen (2011)	"In the present study we investigate the relation between age of adult citizens with brain injury and (a) staff estimation of unsatisfied needs, and (b) staff estimation of service provision relevance. It is discussed whether	Not mentioned	"(…) negatively biased perceptions of older adults" (Butler, 1969) (p. 26) "(…) prejudice of younger age groups toward older age groups" (Butler, 1969) (p. 26) "(…) explicit versus implicit, negative	Differences by patient age regarding staff estimation of unsatisfied needs for help and service Differences by patient age regarding staff estimation of service provision relevance	Not applicable	Quantitative (questionnaires)

	age of citizens with brain injury may bias staff appraisals of brain injury service provision in Denmark." (p. 28)		versus positive ageism in different levels of analysis i.e. individual, social network, institutional and cultural discrimination (Iversen, Larsen, & Solem, 2009)" (p. 26)			
33- Portière et al (2010)	"To determine whether discriminatory practices exist (based on horizontal equity: same treatment for similar patients) in decision-making when dealing with breast cancer patients aged 70+"	Not mentioned	Not mentioned	Differences by patient age regarding access to treatment Differences by patient age regarding prescription of chemotherapy	Not applicable	Quantitative (mail questionnaire)
34- Rudd et al. (2007)	"(…) to determine whether access to high-quality stroke care is affected by the age or gender of the patient or by weekend admission." (p. 247)	Not mentioned	Ageism implicitly associated with age-based discrimination	Royal College of Physicians Intercollegiate Working Party Stroke Audit Tool Likelihood of being treated in a stroke unit by patient age Likelihood of being scanned within 24h by patient age Likelihood of receiving secondary prevention and rehabilitation by patient age Likelihood of being	Not applicable	Quantitative (National Sentinel Audit of stroke in 2004, both on the organization of in-patient stroke care and the process of care to hospitals managing stroke patients)

				subjected to brain imaging at weekends by patient age		
35- Skirbekk and Nortvedt (2014)	"We have studied ethical considerations of care among health professionals when treating and setting priorities for elderly patients in Norway" (p. 192)	Not mentioned	Ageism is implicitly associated with age-based discrimination	Not applicable	Themes: "What is Left to Save?" (Elderly patients are not as likely to recover completely from their illnesses as younger patients) "Elderly Patients Can't Tolerate the Same Treatment" (the risk associated with many forms of treatment becomes greater as the patients get older "The Oldest and Sickest Patients are Treated Extremely Aggressively" (elderly patients frequently got medical treatment that was too aggressive, and sometimes futile or meaningless for the patient)	Qualitative (in-depth interviews and focus groups)
36- Topaz and Doron (2013)	"The goals of this study were (a) to explore nurses' level of knowledge related to ageing and the attitudes of nurses toward older	Allport's intergroup contact theory (Ajzen, 2005; Allport, 1954): attitudes have a strong influence on an	Ageism is "discrimination against individuals based on their chronological age" (Corner, Brittain, and Bond, 2007; Nelson, 2002)	Attitudes towards Older People Scale (Kogan, 1961); The instrument's statements measure explicit stereotypes and prejudices, both positive and negative	Not applicable	Quantitative (survey requesting selected demographic and work characteristic information; Attitudes towards Older People Scale (Kogan, 1961);

	people in acute care; and (b) to examine the association between nurses' attitudes toward aging and their socio-demographic (sex, ethnic group, age, place of birth) and work characteristics (professional training, academic education, hospital unit, geriatric experience, working experience, shift).” (p. 3)	individual's actual behavior	“Negative biases and ageist attitudes among caregivers, and particularly nurses, toward older people in acute care settings, are among its more notable expressions in the health care system (Holroyd, Dahlke, Fehr, Jung, & Hunter, 2009)” (p. 1)	Palmore's Facts on Ageing Quiz 1 (Palmore, 1977); The instrument’s statements measure right and wrong knowledge about older people and ageing, as well as positive and negative stereotypes about older people “(…) bivariate analysis of attitudes with all study variables using the t-test for continuous data, the chi-square test for categorical data, and the one-way ANOVA for categorical variables with more than two categories. Furthermore, we created a multiple regression model to predict nurses' attitudes toward older people.” (p. 4-5)		Palmore's Facts on Ageing Quiz 1- Palmore (1977)
37- Wonnacott et al. (2012)	“to analyse what nephrologists do for their outpatients and seek to specifically delineate any difference in intervention rates on the basis of patient age, with an aim to differentiate those patients who require active management	Not mentioned	“difference in intervention rates on the basis of patient age” (p. 705)	Description of the indicators used: Patients were grouped into two groups: group 1- patients receiving surveillance (biochemistry, proteinuria, Blood Pressure) without intervention to management, and group 2 - patients with a change in management. Furthermore, patients were	Not applicable	Quantitative (analysis of the clinical records of 546 patients [312 under 75 years old and 234 over 75 years old] from a single NHS Trust in South Wales, United Kingdom. Descriptive statistical analysis and statistical tests were undertaken to compare the results

	in a secondary care setting from those who are simply being monitored under this service" (p. 705).			separated into two age groups: under 75 years old; 75 years or older. A comparison of results for intervention and non-intervention patients was undertaken, and also by age group Indicators of ageism: % of patients under 75 years old (or 75 and older), who had an intervention (change in patient management) during the period analyzed, adjusted for Chronic Kidney Disease (CKD) staging The proportions of patients under 75 years old (and 75 and older) who received a specific intervention, adjusted for CKD staging		between the two groups of patients (Chi squared, Kruskal–Wallis and Mann–Whitney tests).

Appendix 2 - Supplementary data_Quantitative studies which did not administer a validated scale of ageism

Section A – Indicators, facets and components of ageism

Indicators of Ageism	Facets of Ageism	Components of Ageism									Studies
		Cognitive	Affective	Behavioral	Self-Dir.	Other-Dir.	Explicit	Implicit	Positive	Negative	
Indicator implicitly defined	Stereotypes and beliefs about older people and ageing: mood	√				√	√		√		15- Gunderson et al. (2005)
Indicator implicitly defined		√				√	√			√	15- Gunderson et al. (2005)
As older people become increasingly old they become more irritable, touchy and unpleasant		√				√	√			√	23- Kydd et al. (2014)
On the whole, communicating with older people can be very frustrating	Prejudice towards older people: communication		√			√	√			√	23- Kydd et al. (2014)
The thought of being old worries me	Prejudice towards old age: being old		√		√		√			√	23- Kydd et al. (2014)
The "age" cue is not equally influential in doctors' decision-making accounts for older and midlife patients	Discrimination in diagnosis: the influence of the "age cue"			√		√	√		√	√	1- Adams et al. (2006)
Differences between the number of cues considered by doctors for midlife and older patients	Discrimination in diagnosis: asking information to patients			√		√	√		√	√	1- Adams et al. (2006)
Differences between the number of additional questions considered by doctors for midlife and older patients				√		√	√		√	√	2- Arber et al. (2006)
Differences between middle aged men and older patients with respect to taking a sexual history				√		√	√		√	√	5- Bouman and Arcelus (2001)
Differences in the number of diagnostic inferences considered by doctors for older patients compared with midlife patients	Discrimination in diagnosis:			√		√	√		√	√	1- Adams et al. (2006)

Doctors' use of sophisticated pattern-recognition approaches when making diagnostic decisions is not the same for older and midlife patients	diagnostic inferences and pattern-recognition approaches			√		√	√		√	√	1- Adams et al. (2006)
Differences between the number of diagnostic tests ordered by doctors for midlife and older patients	Discrimination in diagnosis: ordering/performing diagnostic tests/examinations			√		√	√		√	√	2- Arber et al. (2006)
Differences by patient age regarding the completion of evidence-based colorectal cancer screening				√		√	√		√	√	20- Jerant et al. (2004)
Differences by patient age regarding histological confirmation				√		√	√		√	√	31- Peake et al. (2003)
Likelihood of being scanned within 24h by patient age				√		√	√		√	√	34- Rudd et al. (2007)
Likelihood of being subjected to brain imaging at weekends by patient age				√		√	√		√	√	34- Rudd et al. (2007)
Differences between four age groups between (<65; 65-75; 75-80; >80) in exercise tolerance testing				√		√	√		√	√	4- Bond et al. (2003)
Differences between the number of physical examinations performed by doctors for middle and older patients				√		√	√		√	√	2- Arber et al. (2006)
Differences between midlife and older patients in doctors' consideration of the potential outcomes of not treating suspected conditions	Discrimination in treatment and management: consideration of the potential outcomes of not treating suspected conditions			√		√	√		√	√	1- Adams et al. (2006)
Differences between midlife and older patients in doctors' citations of health-care system constraints as reasons for non-intervention	Discrimination in treatment and management: doctors' citations of health-care system constraints as reasons for non-intervention			√		√	√		√	√	1- Adams et al. (2006)
Differences by patient age regarding the involvement of patients in decision making to intensify pain alleviation	Discrimination in treatment and management: involvement of patients in decision making			√		√	√		√	√	7- Chambaere et al. (2012)
Differences by patient age regarding staff estimation of unsatisfied needs for help and service	Discrimination in treatment and management: evaluating the patients unsatisfied needs			√		√		√	√	√	32- Pedersen and Mehlsen (2011)
Differences by patient age regarding staff estimation of service provision relevance	Discrimination in treatment and management: estimating the relevance of the provided services			√		√		√	√	√	32- Pedersen and Mehlsen (2011)
Differences by patient age regarding senior medical staff involvement in treatment	Discrimination in treatment and management: senior medical staff			√		√	√		√	√	14- Grant et al. (2000)

	involvement										
Differences between midlife and older patients in doctors' prescription of appropriate coronary heart disease medication	Discrimination in treatment and management: prescribing treatments			√		√	√		√	√	2- Arber et al. (2006)
Differences between older patients and younger patients regarding prescription of statins				√		√	√		√	√	13- Gnavi et al. (2007)
Differences by patient age regarding prescription of chemotherapy				√		√	√		√	√	33- Portière et al (2010)
Differences between four age groups between (<65; 65-75; 75-80; >80) in revascularization and receipt of thrombolysis				√		√	√		√	√	4- Bond et al. (2003)
Differences between three age groups (<65, 65–74 and 75>) regarding active treatment (surgery, radiotherapy, chemotherapy)				√		√	√		√	√	31- Peake et al. (2003)
Differences by patient age regarding access to treatment				√		√	√		√	√	33- Portière et al (2010)
Differences between midlife and older patients in doctors' referral to a specialist, and timing of follow-up visit	Discrimination in treatment and management: referrals to other health professionals/services			√		√	√		√	√	2- Arber et al. (2006)
Differences by patient age regarding transfers to regional neurosurgical centers				√		√	√		√	√	14- Grant et al. (2000)
Differences between middle aged men and older patients in referring to a sexual therapist and a community psychiatric nurse				√		√	√		√	√	5- Bouman and Arcelus (2001)
Differences between four age groups between (<65; 65-75; 75-80; >80) in referrals for cardiac catheter and angiography				√		√	√		√	√	4- Bond et al. (2003)
Differences between midlife and older patients in doctors' giving lifestyle or behavioral advice	Discrimination in treatment and management: doctors' advice and recommendations			√		√	√		√	√	2- Arber et al. (2006)
Likelihood of older people (≥ 65 years old) receiving physicians' recommendations for physical activity compared with the middle-aged group (45–64 years old)				√		√	√		√	√	3- Austin et al. (2013)
Likelihood of receiving secondary prevention and rehabilitation by patient age				√		√	√		√	√	34- Rudd et al. (2007)
Differences by patient age regarding the use of resuscitation room facilities	Discrimination in treatment and management: access to care services/facilities			√		√	√		√	√	14- Grant et al. (2000)
Differences by patient age regarding admission to intensive care units				√		√	√		√	√	14- Grant et al. (2000)
Differences by patient age regarding access to critical care				√		√	√		√	√	18- Hubbard et al. (2003)
Differences by patient age regarding the access to a range of services appropriate to people with psychosis				√		√	√		√	√	29- Mitford et al. (2010)

Likelihood of being treated in a stroke unit by patient age				√		√	√		√	√	34- Rudd et al. (2007)
Older people should have access, if appropriate, to medical and surgical procedures regardless of age				√		√	√			√	23- Kydd et al. (2014)
The proportion of patients aged < 70 years old and the proportion of patients aged ≥ 70 years old, adjusted for risk, for whom cardiopulmonary resuscitation was attempted prior to death	Discrimination in treatment and management: resuscitation			√		√	√			√	27- Mackay et al. (2004)
The proportion of patients aged < 70 years old and the proportion of patients aged ≥ 70 years old, adjusted for risk, for whom Do Not Attempt Resuscitation (DNAR) order had been used				√		√	√			√	27- Mackay et al. (2004)
Proportion of patients <75 years old and ≥ 75 years old who had an intervention (change in patient management) during the period analyzed, adjusted for Chronic Kidney Disease staging	Discrimination in treatment and management: surveillance vs intervention			√		√	√			√	37- Wonnacott et al. (2012)
The proportions of patients <75 years old and ≥ 75 years old who received a specific intervention, adjusted for Chronic Kidney Disease staging	Discrimination in treatment and management: type of intervention			√		√	√			√	37- Wonnacott et al. (2012)
Proportion of trials excluding individuals using an arbitrary upper age limit or other exclusion criteria that might indirectly cause limited recruitment of older individuals	Discrimination in clinical trials			√		√	√			√	9- Cruz-Jentoft et al. (2013); 6- Briggs (2012)
Differences by patient age regarding the likelihood of dying within 6 months of diagnosis	Discrimination in survival rates			√		√	√		√	√	31- Peake et al. (2003)
Differences by patient age regarding unexpected deaths in three injury severity groups				√		√	√		√	√	14- Grant et al. (2000)

Section B - Number of indicators by facets of ageism and components of ageism

Facets of ageism	No. of indicators in each facet	Number of indicators in each component of ageism									Identification number of the studies
		Cognitive	Affective	Behavioral	Self-Dir.	Other-Dir.	Explicit	Implicit	Positive	Negative	
Stereotypes and beliefs about older people and ageing: mood	3	3	0	0	0	3	3	0	1	2	15; 23
Prejudice towards older people: communication	1	0	1	0	0	1	1	0	0	1	23
Prejudice towards old age: being old	1	0	1	0	1	0	1	0	0	1	23
Discrimination in diagnosis: the influence of the "age cue"	1	0	0	1	0	1	1	0	1	1	1
Discrimination in diagnosis: asking information to patients	3	0	0	3	0	3	3	0	3	3	1; 2; 5
Discrimination in diagnosis: diagnostic inferences and pattern-recognition approaches	2	0	0	2	0	2	2	0	2	2	1
Discrimination in diagnosis: ordering/performing diagnostic tests/examinations	7	0	0	7	0	7	7	0	7	7	2; 4; 20; 31; 34
Discrimination in treatment and management: consideration of the potential outcomes of not treating suspected conditions	1	0	0	1	0	1	1	0	1	1	1
Discrimination in treatment and management: doctors' citations of health-care system constraints as reasons for non-intervention	1	0	0	1	0	1	1	0	1	1	1
Discrimination in treatment and management: involvement of patients in decision making	1	0	0	1	0	1	1	0	1	1	7
Discrimination in treatment and management: evaluating the patients unsatisfied needs	1	0	0	1	0	1	0	1	1	1	32
Discrimination in treatment and management: estimating the relevance of the provided services	1	0	0	1	0	1	0	1	1	1	32
Discrimination in treatment and management: senior medical staff	1	0	0	1	0	1	1	0	1	1	14

involvement											
Discrimination in treatment and management: prescribing treatments	6	0	0	6	0	6	6	0	6	6	2; 4; 13; 31; 33
Discrimination in treatment and management: referrals to other health professionals/services	4	0	0	4	0	4	4	0	4	4	2; 4; 5; 14
Discrimination in treatment and management: doctors' advice and recommendations	3	0	0	3	0	3	3	0	3	3	2; 3; 34
Discrimination in treatment and management: access to care services/facilities	6	0	0	6	0	6	6	0	5	6	14; 18; 23; 29; 34
Discrimination in treatment and management: resuscitation	2	0	0	2	0	2	2	0	0	2	27
Discrimination in treatment and management: surveillance vs intervention	1	0	0	1	0	1	1	0	0	1	37
Discrimination in treatment and management: type of intervention	1	0	0	1	0	1	1	0	0	1	37
Discrimination in clinical trials	1	0	0	1	0	1	1	0	0	1	6; 9
Discrimination in survival rates	2	0	0	2	0	2	2	0	2	2	14; 31
Total	50 [21]	3 [2]	2 [1]	45 [20]	1 [1]	49 [21]	48 [20]	2 [1]	40 [17]	49 [21]	

Notes:

- The numbers between square brackets refer to the number of studies.
- The sum of the number of indicators and studies in the positive and negative components exceeds the total number of indicators and studies, because 39 indicators measure both positive and negative ageism.

Appendix 3 - Supplementary data_Quantitative studies which administered a validated scale of ageism

Section A – Indicators, facets and components of ageism

Indicators of Ageism	Facets of Ageism	Components of Ageism									Studies
		Cognitive	Affective	Behavioral	Self-Dir.	Other-Dir.	Explicit	Implicit	Positive	Negative	
There is something different about most people; it's hard to find out what makes them tick (ATOPS)	Stereotypes and beliefs about older people: communication	√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people are really no different from anybody else; they're as easy to understand as younger people (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people get set in their ways and are unable to change (ATOPS)	Stereotypes and beliefs about older people: adjustment to change	√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people are capable of new adjustments when the situation demands it (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)

The majority of old people are unable to adapt to change (FAQ)		√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
I will be more set in my ways and reluctant to change (RAQ)		√			√		√			√	12- Gething et al. (2002)
Most old people would prefer to quit work as soon as pensions or their children can support them (ATOPS)	Stereotypes and beliefs about older people: labor market participation	√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people would prefer to continue working just as long as they possibly can rather than be dependent on anybody (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
The majority of old people (age 65 or older) are working or would like to have some kind of work to do (including housework or volunteer work) (FAQ)		√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
Most old people tend to let their homes become shabby and unattractive (ATOPS)	Stereotypes and beliefs about older people: home cleaning and maintenance	√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people can generally be counted on to maintain a clean, attractive home (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
It is foolish to claim that wisdom comes with age (ATOPS)	Stereotypes and beliefs about ageing and old age: wisdom	√				√	√		√		10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995);

											26- Lui and Wong (2009); 36- Topaz and Doron (2013)
People grow wiser with the coming of old age (ATOPS)		√				√	√		√		10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people make one feel ill at ease (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people are very relaxing to be with (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people bore others by their insistence on talking "about the good old days" (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
One of the most interesting and entertaining qualities of most old people is their accounts of their past experiences (ATOPS)		√				√	√		√		10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people spend too much time prying into the affairs of others and giving unsought advice (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995);

											26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people tend to keep to themselves and give advice only when asked (ATOPS)	Stereotypes and beliefs about older people: interaction style and mood	√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people are irritable, grouchy, and unpleasant (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people are cheerful, agreeable, and good humored (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people make excessive demands for love and reassurance more than anyone else (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people need no more love and reassurance than anyone else (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
The majority of old people (age 65 or older) say they feel miserable most of the time (FAQ)		√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
The majority of old people (age 65 or older) say they are seldom bored (FAQ)		√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)

The majority of older people (age 65 or older) say they are seldom angry (FAQ)	Stereotypes and beliefs about older people: similarity/dissimilarity in relation to others	√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
Many old people just live in the past (FSA)		√				√	√			√	24- Leung et al. (2011)
Most old people can be irritating because they tell the same stories over and over again (FSA)		√				√	√			√	24- Leung et al. (2011)
Old people complain more than other people do (FSA)		√				√	√			√	24- Leung et al. (2011)
I will become more irritable and grouchy than I am now (RAQ)		√			√		√			√	12- Gething et al. (2002)
Others may find me difficult to get along with (RAQ)		√			√		√			√	12- Gething et al. (2002)
There are a few exceptions, but in general most old people are pretty much alike (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
In general, the majority of old people tend to be pretty much alike (FAQ)		√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
It is evident that most old people are very different from one another (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people should be more concerned with their personal appearance; they're too untidy (ATOPS)	Stereotypes and beliefs about older people: personal appearance and hygiene	√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people seem quite clean and neat in their personal appearance (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995);

											26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Most old people would be considered to have poor personal hygiene (FSA)		√				√	√			√	24- Leung et al. (2011)
Most old people are constantly complaining about the behavior of the younger generation (ATOPS)	Stereotypes and beliefs about older people: attitudes towards younger generations	√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
One seldom hears old people complaining about the behavior of the younger generation (ATOPS)		√				√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
The majority (more than half) of old people (age 65 or older) are senile (i.e., defective memory, disoriented, or demented, etc.) (FAQ)	Stereotypes and beliefs about older people: cognitive functions	√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
All five senses tend to decline in old age (FAQ)		√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
Old people usually take longer than young people to learn something new (FAQ)		√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
It is almost impossible for the majority of old people to learn new things (FAQ)		√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
The majority (more than half) of old people (age 65 or older) have no capacity for sexual relations (FAQ)	Stereotypes and beliefs about older people: body capacities and functions	√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
Lung capacity tends to decline in old age (FAQ)		√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
Physical strength tends to decline in old age (FAQ)		√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
The reaction time of the majority of old people tends to be slower than the reaction time of younger people (FAQ)		√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
At least 10% of the aged (age 65 or older) are	Stereotypes and beliefs about	√				√	√			√	12- Gething et al. (2002); 36-

living in long-stay institutions (i.e., nursing homes, mental hospitals, homes for the aged, etc.) (FAQ)	older people: living arrangements										Topaz and Doron (2013)
Aged drivers (age 65 or older) have fewer accidents per driver than drivers under the age 65 (FAQ)	Stereotypes and beliefs about older people: accidents	√				√	√		√		12- Gething et al. (2002); 36- Topaz and Doron (2013)
Older workers have fewer accidents than younger workers (FAQ)		√				√	√		√		12- Gething et al. (2002); 36- Topaz and Doron (2013)
The majority of older workers cannot work as effectively as younger workers (FAQ)	Stereotypes and beliefs about older people: work effectiveness	√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
About 80% of the aged (age 65 or older) say they are healthy enough to carry out their normal activities (FAQ)	Stereotypes and beliefs about older people: health perception	√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
The majority of medical practitioners give low priority to the aged (FAQ)	Stereotypes and beliefs about the priority given by medical practitioners to older persons	√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
The majority of older people (age 65 or older) have incomes below the poverty level ($5,447 for an older person or $6,872 for an older couple) (FAQ)	Stereotypes and beliefs about older people: income	√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
Older people tend to become more religious as they age (FAQ)	Stereotypes and beliefs about older people: religion	√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
The health and socioeconomic status of older people (compared to younger people) in the year 2000 will probably be about the same as now (FAQ)	Stereotypes and beliefs about older people: health and socioeconomic status	√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
Many old people are stingy and hoard their money and possessions (FSA)	Stereotypes and beliefs about older people: attitudes towards money	√				√	√			√	24- Leung et al. (2011)
Many old people are not interested in making new friends, preferring instead the circle of friends they have had for years (FSA)	Stereotypes and beliefs about older people: friendship/social segregation	√				√	√			√	24- Leung et al. (2011)
Many old people are happiest when they are with people their own age (FSA)		√				√	√			√	24- Leung et al. (2011)
Complex and interesting conversation cannot be		√				√	√			√	24- Leung et al. (2011)

expected from most old people (FSA)	Stereotypes and beliefs about older people: interaction enjoyment/gratification										
Feeling depressed when around old people is probably a common feeling (FSA)		√				√	√			√	24- Leung et al. (2011)
The company of most old people is quite enjoyable (FSA)		√				√	√			√	24- Leung et al. (2011)
Most old people are interesting, individualistic people (FSA)	Stereotypes and beliefs about older people: individuality and creativity	√				√	√			√	24- Leung et al. (2011)
Old people can be very creative (FSA)		√				√	√			√	24- Leung et al. (2011)
Old people do not need much money to meet their needs (FSA)	Stereotypes and beliefs about older people: needs of money	√				√	√			√	24- Leung et al. (2011)
Old age will be an enjoyable time of life (RAQ)	Stereotypes and beliefs about ageing and old age: enjoyment/satisfaction	√			√		√			√	12- Gething et al. (2002)
Old age brings satisfactions which are not available to the young (RAQ)		√			√		√		√		12- Gething et al. (2002)
Life can get better once you pass middle age (RAQ)		√			√		√		√		12- Gething et al. (2002)
In my old age I will be as enthusiastic about life as I am now (RAQ)		√			√		√			√	12- Gething et al. (2002)
There is a lot to look forward to in regard to being old (RAQ)		√			√		√			√	12- Gething et al. (2002)
I will be more lonely that I am now (RAQ)	Stereotypes and beliefs about older people and old age: loneliness	√			√		√			√	12- Gething et al. (2002)
The majority of old people (age 65 or older) say they are lonely (FAQ)		√				√	√			√	12- Gething et al. (2002); 36- Topaz and Doron (2013)
I won't feel as safe on my own as I do now (RAQ)	Stereotypes and beliefs about old age: security	√			√		√			√	12- Gething et al. (2002)
Progressive / Old-fashioned (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Consistent / Inconsistent (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Independent / Dependent (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Rich / Poor (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Generous / Selfish (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Productive / Unproductive (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Busy / Idle (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Secure / Insecure (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Strong / Weak (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Healthy / Unhealthy (ASDS)		√				√	√		√	√	12- Gething et al. (2002)

Active / Passive (ASDS)	Stereotypes and beliefs about older people: personal traits	√				√	√		√	√	12- Gething et al. (2002)
Handsome / Ugly (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Cooperative / Uncooperative (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Optimistic / Pessimistic (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Satisfied / Dissatisfied (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Expectant / Resigned (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Flexible / Inflexible (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Hopeful / Dejected (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Organized / Disorganized (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Happy / Sad (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Friendly / Unfriendly (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Neat / Untidy (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Trustful / Suspicious (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Self-reliant / Dependent (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Liberal / Conservative (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Certain / Uncertain (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Tolerant / Intolerant (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Pleasant / Unpleasant (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Ordinary / Eccentric (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Aggressive / Defensive (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Exciting / Dull (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
Decisive / Indecisive (ASDS)		√				√	√		√	√	12- Gething et al. (2002)
It would probably be better if most old people lived in residential units with people their own age (ATOPS)			√			√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
It would probably be better if most people lived in residential units with younger people (ATOPS)			√			√	√			√	10- Furlan et al (2009); 11- Gallagher et al. (2006); 21- Kearney et al. (2000); 25- Lookinland and Anson (1995); 26- Lui and Wong (2009); 36- Topaz and Doron (2013)
Old people have too much power in business			√			√	√			√	10- Furlan et al (2009); 11-

and politics (ATOPS)	Prejudice towards older people: social rights and social participation										Gallagher et al. (2006); 21-Kearney et al. (2000); 25-Lookinland and Anson (1995); 26- Lui and Wong (2009); 36-Topaz and Doron (2013)
Old people should have power in business and politics (ATOPS)			√			√	√			√	10- Furlan et al (2009); 11-Gallagher et al. (2006); 21-Kearney et al. (2000); 25-Lookinland and Anson (1995); 26- Lui and Wong (2009); 36-Topaz and Doron (2013)
If old people expect to be liked, their first step is to try to get rid of their irritating faults (ATOPS)			√			√	√			√	10- Furlan et al (2009); 11-Gallagher et al. (2006); 21-Kearney et al. (2000); 25-Lookinland and Anson (1995); 26- Lui and Wong (2009); 36-Topaz and Doron (2013)
When you think about it, old people have the same faults as anybody else (ATOPS)			√			√	√			√	10- Furlan et al (2009); 11-Gallagher et al. (2006); 21-Kearney et al. (2000); 25-Lookinland and Anson (1995); 26- Lui and Wong (2009); 36-Topaz and Doron (2013)
In order to maintain a nice residential neighborhood, it would be best if too many old people did not live in it (ATOPS)			√			√	√			√	10- Furlan et al (2009); 11-Gallagher et al. (2006); 21-Kearney et al. (2000); 25-Lookinland and Anson (1995); 26- Lui and Wong (2009); 36-Topaz and Doron (2013)
You can count on finding a nice residential neighborhood when there is a sizeable number of old people living in it (ATOPS)			√			√	√		√		10- Furlan et al (2009); 11-Gallagher et al. (2006); 21-Kearney et al. (2000); 25-Lookinland and Anson (1995); 26- Lui and Wong (2009); 36-Topaz and Doron (2013)
Most old people should not be trusted to take			√			√	√			√	24- Leung et al. (2011)

care of infants (FSA)											
I don't like it when old people try to make conversation with me (FSA)			√			√	√			√	24- Leung et al. (2011)
Old people should find friends their own age (FSA)			√			√	√			√	24- Leung et al. (2011)
Old people should feel welcome at the social gatherings of young people (FSA)			√			√	√			√	24- Leung et al. (2011)
Old people don't really need to use our community sports facilities (FSA)			√			√	√			√	24- Leung et al. (2011)
It is best that old people live where they won't bother anyone (FSA)			√			√	√			√	24- Leung et al. (2011)
It is sad to hear about the plight of the old in our society these days (FSA)			√			√	√			√	24- Leung et al. (2011)
Old people should be encouraged to speak out politically (FSA)			√			√	√			√	24- Leung et al. (2011)
There should be special clubs set aside within sports facilities so that old people can compete at their own level (FSA)			√			√	√			√	24- Leung et al. (2011)
Old people deserve the same rights and freedoms as do other members of our society (FSA)			√			√	√			√	24- Leung et al. (2011)
Teenage suicide is more tragic than suicide among the old (FSA)	Prejudice towards older people: suicide among older people		√			√	√			√	24- Leung et al. (2011)
I worry that I might become senile and lose my mind (RAQ)			√		√		√			√	12- Gething et al. (2002)
Becoming frail is rarely an issue which concerns me (RAQ)			√		√		√			√	12- Gething et al. (2002)
I will regret the loss of strength and attractiveness (RAQ)			√		√		√			√	12- Gething et al. (2002)
I worry about loss of independence (RAQ)	Prejudice towards ageing and old age: cognitive and physical functions		√		√		√			√	12- Gething et al. (2002)
I worry about becoming frail (RAQ)			√		√		√			√	12- Gething et al. (2002)
I do not worry about the thought of becoming senile and losing my mind (RAQ)			√		√		√			√	12- Gething et al. (2002)
I am concerned about who will care for me if I become frail (RAQ)			√		√		√			√	12- Gething et al. (2002)

It worries me that I won't enjoy life as much as I do now (RAQ)	Prejudice towards ageing and old age: enjoyment and gratification		√		√		√			√	12- Gething et al. (2002)
I find the thought of growing old depressing (RAQ)			√		√		√			√	12- Gething et al. (2002)
I don't feel there is much to be scared about becoming an older person (RAQ)			√		√		√			√	12- Gething et al. (2002)
I won't like growing old (RAQ)			√		√		√			√	12- Gething et al. (2002)
I expect to be a loving, caring person (RAQ)			√		√		√			√	12- Gething et al. (2002)
I would prefer not to go to an open house at a senior's club, if invited (FSA)	Discrimination: social contact with older people			√		√	√			√	24- Leung et al. (2011)
I sometimes avoid eye contact with old people when I see them (FSA)				√		√	√			√	24- Leung et al. (2011)
I personally would not want to spend much time with an old person (FSA)				√		√	√			√	24- Leung et al. (2011)
I would prefer not to live with an old person (FSA)				√		√	√			√	24- Leung et al. (2011)
Most old people should not be allowed to renew their drivers licenses (FSA)	Discrimination: social rights and social participation of older people			√		√	√			√	24- Leung et al. (2011)

ATOPS - Attitudes Towards Older People Scale; ASDS - Aging Semantic Differential Scale; FAQ - Facts on Aging Quiz; FSA - Fraboni Scale of Ageism; RAQ - Reactions on Aging Questionnaire

Note: some statements are formulated in a positive way, what could lead us to classify them with the positive component. However, these were classified with the negative component, given that an agreement with them indicate absence of ageism and a disagreement with them indicate negative ageism (see, for example, the second indicator). The same happens with respect to some statements formulated in a negative way. Apparently they are an indicator of negative ageism, but an agreement with them does not necessarily indicates negative ageism, but a disagreement indicates positive ageism (see, for example, the 12th indicator).

Section B - Number of indicators by facets of ageism and components of ageism

Facets of ageism	No. of indicators in each facet	Number of indicators in each component of ageism									Identification number of the studies
		Cognitive	Affective	Behavioral	Self-Dir.	Other-Dir.	Explicit	Implicit	Positive	Negative	
Stereotypes and beliefs about older people: communication	2	2	0	0	0	2	2	0	0	2	10; 11; 21; 25; 26; 36
Stereotypes and beliefs about older people: adjustment to change	4	4	0	0	1	3	4	0	0	4	10; 11; 12; 21; 25; 26; 36
Stereotypes and beliefs about older people: labor market participation	3	3	0	0	0	3	3	0	0	3	10; 11; 12; 21; 25; 26; 36
Stereotypes and beliefs about older people: home cleaning and maintenance	2	2	0	0	0	2	2	0	0	2	10; 11; 21; 25; 26; 36
Stereotypes and beliefs about ageing and old age: wisdom	2	2	0	0	0	2	2	0	2	0	10; 11; 21; 25; 26; 36
Stereotypes and beliefs about older people: interaction style and mood	18	18	0	0	2	16	18	0	1	17	10; 11; 12; 21; 24; 26; 36; 25
Stereotypes and beliefs about older people: similarity/dissimilarity in relation to others	3	3	0	0	0	3	3	0	0	3	10; 11; 12; 21; 25; 26; 36
Stereotypes and beliefs about older people: personal appearance and hygiene	3	3	0	0	0	3	3	0	0	3	10; 11; 21; 24; 25; 26; 36
Stereotypes and beliefs about older people: attitudes towards younger generations	2	2	0	0	0	2	2	0	0	2	10; 11; 21; 25; 26; 36
Stereotypes and beliefs about older people: cognitive functions	4	4	0	0	0	4	4	0	0	4	12; 36
Stereotypes and beliefs about older people: body capacities and functions	4	4	0	0	0	4	4	0	0	4	12; 36
Stereotypes and beliefs about older people: living arrangements	1	1	0	0	0	1	1	0	0	1	12; 36

Stereotypes and beliefs about older people: accidents	2	2	0	0	0	2	2	0	2	0	12; 36
Stereotypes and beliefs about older people: work effectiveness	1	1	0	0	0	1	1	0	0	1	12; 36
Stereotypes and beliefs about older people: health perception	1	1	0	0	0	1	1	0	0	1	12; 36
Stereotypes and beliefs about the priority given by medical practitioners to older persons	1	1	0	0	0	1	1	0	0	1	12; 36
Stereotypes and beliefs about older people: income	1	1	0	0	0	1	1	0	0	1	12; 36
Stereotypes and beliefs about older people: religion	1	1	0	0	0	1	1	0	0	1	12; 36
Stereotypes and beliefs about older people: health and socioeconomic status	1	1	0	0	0	1	1	0	0	1	12; 36
Stereotypes and beliefs about older people: attitudes towards money	1	1	0	0	0	1	1	0	0	1	24
Stereotypes and beliefs about older people: friendship/social segregation	2	2	0	0	0	2	2	0	0	2	24
Stereotypes and beliefs about older people: interaction enjoyment/gratification	3	3	0	0	0	3	3	0	0	3	24
Stereotypes and beliefs about older people: individuality and creativity	2	2	0	0	0	2	2	0	0	2	24
Stereotypes and beliefs about older people: needs of money	1	1	0	0	0	1	1	0	0	1	24
Stereotypes and beliefs about ageing and old age: enjoyment/satisfaction	5	5	0	0	5	0	5	0	2	3	12
Stereotypes and beliefs about older people and old age: loneliness	2	2	0	0	1	1	2	0	0	2	12; 36
Stereotypes and beliefs about old age: security	1	1	0	0	1	0	1	0	0	1	12
Stereotypes and beliefs about older people: personal traits	64	64	0	0	0	64	64	0	32	32	12
Prejudice towards older people: social rights and social participation	18	0	18	0	0	18	18	0	1	17	10; 11; 21; 24; 25; 26; 36

Prejudice towards older people: suicide among older people	1	0	1	0	0	1	1	0	0	1	24
Prejudice towards ageing and old age: cognitive and physical functions	7	0	7	0	7	0	7	0	0	7	12
Prejudice towards ageing and old age: enjoyment and gratification	5	0	5	0	5	0	5	0	0	5	12
Discrimination: social contact with older people	4	0	0	4	0	4	4	0	0	4	24
Discrimination: social rights and social participation of older people	1	0	0	1	0	1	1	0	0	1	24
Total	173 [8]	137 [8]	31 [8]	5 [1]	22 [1]	151 [8]	173 [8]	0 [0]	40 [7]	133 [8]	

Note: the numbers between square brackets refer to the number of studies.

Section C – Characterization of the scales of ageism

The Attitudes Towards Older People Scale: it measures stereotypes and prejudice towards older people, both positive and negative, and is organized in four dimensions: authoritarianism and anomie; physical disability; mental illness; and personality. It is composed by 34 statements with a Likert scale format.

The Aging Semantic Differential Scale: it measures stereotypes and beliefs about older, both positive and negative, and is organized in three dimensions/factors, including instrumental/ineffective (level of effective goal orientation, adaptability and energy output of older people); autonomous/dependent (level of dependency upon others and personal autonomy); and personal acceptability/unacceptability (level of social interaction). It consists of 32 pairs of opposite adjectives with a Likert scale format, in which the participants are requested to indicate which adjectives best describe a 35-year-old and 70-year-old person.

Facts on Aging Quiz: it measures stereotypes and beliefs about older people, both positive and negative, and it is composed by 25 statements with a true-false format.

Fraboni Scale of Ageism: it was designed to measure stereotypes, prejudice and discrimination towards older people, both positive and negative, and is organized in three dimensions/factors: antilocution (refers to mainly to stereotypes, positive and negative, about older people); discrimination (refers to attitudes, positive and negative, towards

social rights and social participation of older people); and avoidance (refers to affective attitudes and behavior, positive and negative, with respect to social contact with older people). It is composed by 29 statements with a Likert scale format.

Reactions on Aging Questionnaire: it was developed to measure "(…) attitudes towards self ageing by exploring what the person anticipates he or she will be like in old age." (Gething et al., 2002: 75). This scale is organized in three dimensions/factors, including fear of frailty; tedium in later life; and losses in later life. It is composed by 27 statements with a Likert scale format. It is important to clarify that these scales were not designed to measure stereotypes, prejudice and discrimination towards older persons in the context of healthcare, but rather towards older persons in general.

Appendix 4 - Supplementary data_Qualitative studies

Section A – Indicators, facets and components of ageism

Indicators of Ageism	Facets of Ageism	Components of Ageism									Studies
		Cognitive	Affective	Behavioral	Self-Dir.	Other-Dir.	Explicit	Implicit	Positive	Negative	
Believing that all old people in hospital are problematic (they do not fit in the hospital environment)	Stereotypes and beliefs about older patients: adaptation to the hospital	√				√	√	√		√	30- Park and Chappell (2010)
Considering older patients as a burden (they are perceived to require more work)	Stereotypes and beliefs about older patients: required work	√				√	√			√	17- Higgins et al. (2007)
Considering that care for older patients is a waste of time (cure is perceived as not being a possibility, and improving quality of live is perceived as an impossibility)	Stereotypes and beliefs about older patients: cure and improving quality of life	√				√	√			√	17- Higgins et al. (2007)
Believing that doctors perceive older patients as "complain for nothing"	Stereotypes and beliefs about older patients: complains	√				√	√			√	8- Clarke et al. (2014)
Attributing the early symptoms of dementia to normal ageing	Stereotypes and beliefs about older patients: symptoms	√			√	√	√	√		√	19- Iliffe et al. (2005)
Believing that back pain is directly related to old age		√			√		√			√	28- Makris et al. (2015)
Holding the assumption that older patients are not as likely to recover completely from their illnesses as younger patients	Stereotypes and beliefs about the older patients: responses to treatments	√				√	√	√		√	35- Skirbekk and Nortvedt (2014)
Holding the assumption that older patients cannot tolerate the same treatment administered to younger people		√				√	√	√		√	35- Skirbekk and Nortvedt (2014)
Believing that older patients are not able to self-manage	Stereotypes and beliefs about the older patients: self-manage	√				√	√			√	16- Hansen et al. (20159
Not conducting full examinations	Discrimination in diagnosis: examinations			√		√	√			√	8- Clarke et al. (2014)

Giving low priority to the health needs of older people	Discrimination in treatment and management: prioritizing older patients			√		√	√			√	19- Iliffe et al. (2005)
Age barriers (upper age limits) for referral to specialists	Discrimination in treatment and management: referring older patients			√		√	√			√	19- Iliffe et al. (2005); 8- Clarke et al. (2014)
Providing marginal care and attention	Discrimination in treatment and management: level of care provided			√		√	√			√	17- Higgins et al. (2007)
Administering an inappropriate treatment	Discrimination in treatment and management: appropriateness of treatment			√		√	√			√	35- Skirbekk and Nortvedt (2014)
Labelling older patients as “old”, “slow” and other negative attributes	Discrimination in treatment and management: labelling older patients			√		√	√			√	22- Koch and Webb (1996) 17- Higgins et al. (2007)
Not giving the opportunity to older patients of having influence on their own care	Discrimination in treatment and management: disempowering older patients			√		√	√			√	22- Koch and Webb (1996)
Not giving the opportunity to older patients of expressing individual needs				√		√	√			√	22- Koch and Webb (1996); 16- Hansen et al. (20159
Distancing oneself from those older adults who are perceived as having consulted their physicians for frivolous reasons or who are perceived as being conformed to negative stereotypes of elderly patients as invariably frail, dependent, and overly difficult	Discrimination in social interactions: other older patients			√	√		√			√	8- Clarke et al. (2014)

Section B - Number of indicators by facets of ageism and components of ageism

Facets of ageism	No. of indicators in each facet	Number of indicators in each component									Identification number of the studies
		Cognitive	Affective	Behavioral	Self-Dir.	Other-Dir.	Explicit	Implicit	Positive	Negative	
Stereotypes and beliefs about older patients: adaptation to the hospital	1	1	0	0	0	1	1	1	0	1	30
Stereotypes and beliefs about older patients: required work	1	1	0	0	0	1	1	0	0	1	17
Stereotypes and beliefs about older patients: cure and improving quality of life	1	1	0	0	0	1	1	0	0	1	17
Stereotypes and beliefs about older patients: complains	1	1	0	0	0	1	1	0	0	1	8
Stereotypes and beliefs about older patients: symptoms	2	2	0	0	2	1	2	1	0	2	19; 28
Stereotypes and beliefs about the older patients: responses to treatments	2	2	0	0	0	2	2	2	0	2	35
Stereotypes and beliefs about the older patients: self-manage	1	1	0	0	0	1	1	0	0	1	16
Discrimination in diagnosis: examinations	1	0	0	1	0	1	1	0	0	1	8
Discrimination in treatment and management: prioritizing older patients	1	0	0	1	0	1	1	0	0	1	19
Discrimination in treatment and management: referring older patients	1	0	0	1	0	1	1	0	0	1	19
Discrimination in treatment and management: level of care provided	1	0	0	1	0	1	1	0	0	1	17
Discrimination in treatment and management: appropriateness	1	0	0	1	0	1	1	0	0	1	35

of treatment											
Discrimination in treatment and management: labelling older patients	1	0	0	1	0	1	1	0	0	1	22, 17
Discrimination in treatment and management: disempowering older patients	2	0	0	2	0	2	2	0	0	2	22; 16
Discrimination in social interactions: other older patients	1	0	0	1	1	0	1	0	0	1	8
Total	18 [8]	9 [7]	0 [0]	9 [5]	3 [3]	16 [7]	18 [8]	4 [3]	0 [0]	18 [8]	

Notes:

- The numbers between square brackets refer to the number of studies.
- The sum of the number of indicators in the self-directed and other-directed components exceeds the total number of indicators and studies, because one indicator measures both self-directed and other-directed ageism.
- The sum of the number of indicators in the explicit and implicit components exceeds the total number of indicators and studies, because four indicators measure both explicit and implicit ageism.