

Operational definition of active and healthy ageing (AHA): The European Innovation Partnership (EIP) on AHA Reference Site questionnaire

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Abstract

A core operational definition of active and healthy ageing (AHA) is needed to conduct comparisons. A conceptual AHA framework proposed by the European Innovation Partnership on Active and Healthy Ageing Reference Site Network includes several items such as functioning (individual capability and underlying body systems), well-being, activities and participation, and diseases (including non-communicable diseases, frailty, mental and oral health disorders). The instruments proposed to assess the conceptual framework of AHA have common applicability and availability attributes. The approach includes core and optional domains/instruments depending on the needs and the questions. A major common domain is function as measured by the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0). WHODAS-2.0 can be used across all diseases and healthy individuals. It covers many of the AHA dimensions proposed by the Reference Site network. However, WHODAS-2.0 does not include all dimensions proposed for AHA assessment. The second common domain is Health-Related Quality of Life (HRQL). A report of the AHA questionnaire in the form of a spider net has been proposed to facilitate usual comparisons across individuals and groups of interest.

Abbreviations

AHA: Active and Healthy Ageing
ECRHS: European Community Respiratory Health Survey
EIP on AHA: European Innovation Partnership on Active and Healthy Ageing
EQ-5D: EuroQOL 5 domains
EU: European Union
GA²LEN: Global Allergy and Asthma European Network
HRQL: Health related quality of life
ICF: International Classification of Functioning, Disability and Health
MACVIA-LR: *Contre les MALadies Chroniques pour un Vieillissement Actif en Languedoc Roussillon*
MeDALL: Mechanisms of the Development of Allergy
NCD: Noncommunicable disease
QOL: Quality-of-Life
SF-6D: Short Form (6-item) health survey
SF-12: Short Form (12-item) health survey
SF-36: Short Form (36-item) health survey
UN: United Nations
VAS: Visual analogue scale
WHO: World Health Organisation
WHODAS 2.0: World Health Organization Disability Assessment Schedule 2.0

Key words: active and healthy ageing, WHODAS 2.0, EQ-5D, SF-12, questionnaire,

Introduction

Health is a multi-dimensional concept, capturing how people feel and how they function. Social, environmental and biomedical factors from early life, and across generations, have long-term impact on health and ageing (1). The broad concept of Active and Healthy Ageing (AHA) was proposed by the World Health Organization (WHO) as the process of optimizing opportunities for health to enhance quality of life as people age. Active and Healthy Ageing is a major societal challenge, common to all populations (2). The inter-relationships between healthy biological ageing and well-being with sex/gender, ethnicity, socio-economic factors and other lifetime determinants (3, 4) need to be better understood. AHA applies to both individuals and population groups throughout the life course.

A universal AHA definition is not available. Moreover, any definition must necessarily differ depending on the purpose and/or the questions to be addressed. The European Innovation Partnership on Active and Healthy Ageing (EIP on AHA) has had a major impact (5), but a core operational definition of AHA is needed to be able to conduct comparisons. To this end, a meeting was organised in Montpellier, October 20-21, 2014, as the annual conference of the EIP on AHA Reference Site MACVIA-LR (*Contre les MALadies Chroniques pour un Vieillissement Actif en Languedoc Roussillon*) (6). The goal of the meeting was to propose an operational AHA definition and to identify instruments that may be used for such an operational definition. Following this meeting, three papers were developed describing current knowledge (7), the emerging conceptual framework (8) and instruments which can be used to assess AHA. The current paper is the third of this series.

1- Conceptual framework

The conceptual AHA framework, based on earlier work by Kuh et al. (9), has been recently accepted for publication (8). It includes several items such as functioning (individual capability and underlying body systems), well-being, activities and participation, and diseases (including Noncommunicable diseases (NCDs), frailty, mental and oral health disorders) (Table 1). It also needs to encompass the idea of resilience, the ability to adapt physiologically, psychologically and socially at different times of the life course.

Table 1: Conceptual framework for AHA (from Bousquet et al. (8) and modified from Kuh et al. (9))

Key domains of healthy and active ageing	
1	Physical and cognitive capability across the life course
2	Psychological and social well-being, mental health and quality of life across the life course
3	Functioning of underlying physiological systems across the life course, preventing or delaying onset of chronic diseases, frailty and disability
Key factors influencing healthy and active ageing	
4	Education, lifelong learning, working and caring
5	Lifetime lifestyles
6	Lifetime social, economic and physical environment (including "geographical" environment: rural, urban)

2- Instruments proposed

The instruments proposed to assess the conceptual framework of AHA should have common applicability and availability attributes (Table 2). The approach proposed includes core and optional domains/instruments depending on the needs and the questions (Table 3). A major common domain is

Function as measured by the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0 (10)). The second common domain is Health-Related Quality of Life (HRQL). A discussion of measuring instruments is presented below. The third common domain is Education. These instruments or derived instruments should be available across the life course since AHA promotion begins during development (11).

Table 2: Common attributes of the AHA questionnaire instruments

<ul style="list-style-type: none"> • Applicable to health and disease (general and clinical populations) • Applicable across diseases • Short, simple and easy to administer • Self-, interviewer- and proxy-administration • Validated in many languages, older age groups, and across cultures • Versions available across the life course (childhood, adulthood, old age) • Applicable at all ages (65 to 100+)

Table 3: Instruments proposed to assess AHA dimensions

AHA dimensions	WHODAS-2.0 (categories)	Added Core questionnaire	Optional questionnaires
Physical activities	Mobility (2)		
Psychological and social well-being	Cognition (1) Self-care (3) Getting along (4) Life activities (5) Participation (6)		
QOL		QOL	
Functioning of underlying physiological systems			Chronic diseases Treatment Pain
Education, working and caring	Life activities (5) Education in demographics		Level of education Work
Lifestyles			Lifestyle
Social, economic and physical environment	Self care (3) Getting along (4) Life activities (5) Participation (6)		

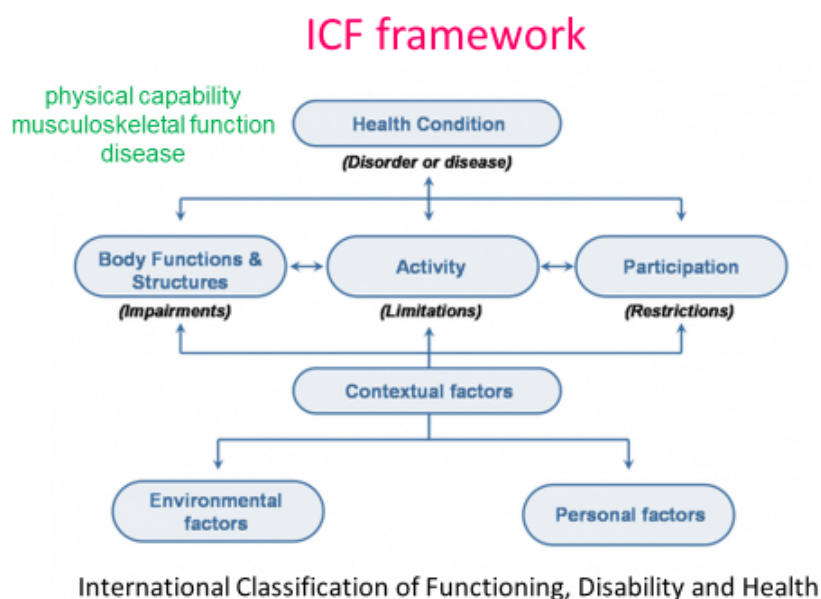
a. Functioning, disability and health

The International Classification of Functioning, Disability and Health (ICF) categories to characterise the functioning properties of any health condition have been selected from three main generic health profile instruments: The WHODAS 2.0 (10), the World Health Survey (WHS) Questionnaire and a list of candidate categories of the generic ICF core set (12, 13).

WHODAS 2.0 is a generic assessment tool for health and disability addressing cognition, mobility, self-care, interactions with other people, life activities and participation. It is applicable to all cultures, in all adult populations and directly linked with the ICF (Figure 1). The 36-item version provides reasonable details and is available as interviewer-, self- and proxy-administered forms. It has excellent psychometric properties. Test–retest studies of the 36-item scale in countries across the world found it to be highly reliable. All items were selected on the basis of an item–response theory. It is easy to use, can be self-administered in around 5 minutes, and administered through a 20 minute interview. It measures similar constructs as in other measures such as the Short Health Survey. But it also measures day-to-day functioning across a range of activity domains. Although other generic instruments for assessing health status can also be mapped to ICF, these do not clearly distinguish between

measurement of symptoms, disability and subjective appraisal. A version for children and adolescents is not yet available.

Figure 1: The ICF framework



Adapted from <http://www.rehab-scales.org/international-classification-of-functioning-disability-and-health.html> (accessed 30 March, 2015)

WHODAS-2.0 can be used across all diseases and healthy individuals. WHODAS-2.0 covers many of the AHA dimensions proposed during the meeting in Montpellier (Table 3). However, WHODAS-2.0 does not include all dimensions proposed for AHA assessment. Other questionnaires exist and are compared in Table 4. In epidemiologic studies, where a large questionnaire is used for other purposes, the 12-item version may be used.

Table 4: Comparison of WHODAS 2.0 and other questionnaires

Instrument	WHODAS 2.0	SF-36	NHATS
Concept /constructs	Disability 6 domains of functions, activities and participation: Cognition (understanding & communicating); Mobility (moving & getting around); Self-care (hygiene, dressing, eating & staying alone); Getting along (interacting with other people); Life activities (domestic responsibilities, leisure, work & school); Participation (joining in with community activities)	Multi-purpose, short-form health survey, including physical functioning (PF)	Health and Ageing trends, including a Physical capacity module (and many more constructs agreeing with the ICF framework)
Items	12, 36 and 12+24 item versions	10 questions in PF domain: Vigorous activities; Moderate activities; Lifting/carrying groceries; Climbing several flights of stairs/one flight of stairs; Bending, kneeling, stooping; Walking >1 km/ half a km/ 100 metres; Bathing/dressing oneself	12 questions: were you able to: walk 6 blocks (about 1 km) / 3 blocks?; walk up 20 stairs (about two flights) / 10 stairs?; lift and carry 10kg (or two full bags of groceries) / a 5kg object?; get down on your knees and get back up / bend over without holding on to anyone or anything?;

		(shorter versions exist: SF-12 and SF-8)	reach up over your head without holding on to anyone or anything?; open a sealed jar using just your hands?; use your fingers to grasp or handle small objects?
Recall period	last month	last month	last month
Method	interview and self-administered versions	interview and self-administered versions	interview, carer report, self-administered versions
Scaling	5 point scale 'how much difficulty did you have in.. (no difficulty- mild – moderate – severe - extreme or cannot do)	3-point response scale from 1 (yes, limited a lot) to 3 (no, not limited at all), totals 21 for the PF domain	yes/no/refused/don't know
Languages	several European languages	numerous European languages	(U.S.) English
Validated	yes	yes	yes
Costs	free online	licencing and registration needed	free online
Website	WHO Disability Assessment Schedule http://www.who.int/classifications/icf/whodasii/en/	http://www.sf-36.org/tools/sf36.shtml#VERS2	http://www.nhats.org/scripts/instruments/015_PC%20Round3.pdf

For physical activity, there are general questionnaires and those aimed at specific populations – the young, mid life, adults or older people such as the Short QUESTIONNAIRE to ASSES Health enhancing physical activity (SQUASH), Physical Activity Questionnaire for Children (PAQ-C) (14), International Physical Activity Questionnaire (IPAQ) (15), or Physical Activity Scale for the Elderly (PASE) (16) (Table 4).

The assessment of physical activity has often been carried out through self-reported questionnaire measures. However, a more recent introduction of accelerometry, as an 'objective' measure, has gained wide acceptance. Sound studies also point to unsolved problems, such as defining appropriate cut offs for different levels of physical activity throughout the life course and even within a given age range. For the purpose of AHA, e-questionnaires appear to be the appropriate tool. However, explorative studies for the reliability of physical activity assessed by advanced techniques, such as cell phones, may be addressed by the reference sites and later translated to AHA. This has the added advantage that GPs can be used to examine where individuals go to and how this relates to work and leisure activities.

b- Well-being and quality of life, Psychological and social well-being

For HRQL, widely consolidated and comparable instruments include, among others, the EQ-5D (17), the SF-12 (18) and the SF-6D derived from SF-36 (19). Although all of these questionnaires measure the same concept, they use a different model of health, a different method of deriving preferences and a different scoring formula. For mental well-being, the WEMWBS (Warwick-Edinburg Well-Being Scale) (20) has been tested in several EU countries, with cross-cultural validity in different and socio-demographic groups. In older people, the CASP-19 scale can be used (21, 22). Candidate questionnaires for Perceived Health Status / Health-Related Quality of Life are listed in Table 5.

Table 5: Comparison of candidate questionnaires for Health-Related Quality of Life (HRQL)

	EQ-5D (5 levels)	SF-6D	SF-12/ RAND-12
Items	5 + 1(VAS)	6	12
Time	3 min	3 min	5 min
Recall period	today	last 4 weeks	last 4 weeks
Overall QoL	-----	-----	-----
General health	VAS (0-100)	General Health	General Health

Physical	Mobility, Self-care & Usual activities	Physical function Role - physical	Physical function Role - physical
Emotional	Anxiety/Depression	Role - Emotional Mental Health	Role - Emotional Mental Health
Pain	Pain	Pain	Pain
Social	-----	Social	Social
Environment	-----	-----	-----
Spirituality	-----	-----	-----
Sleep	-----	-----	-----
Metric Robustness	Very good	Very good	Excellent
Cost/Payment	Paper: free	Free	1 EUR/free
EU languages	All	All	All
Reference/ Norms	Yes, many	Yes, many	Yes, many
Children forms	Yes	No	No
Other issues	Utility	Utility	Worldwide use

VAS: Visual analogue scale

c- Social, societal and economic environment/engagement

Active engagement in life is emerging as a critical factor for what is judged to be successful ageing, and is strongly associated with health and well-being in late life (23). Furthermore, individual socio economic conditions and neighbourhood conditions (24, 25) are also linked to health and well-being. These individual and contextual factors should be considered, if possible, during the long lifetime period as it can be hypothesised that their pattern of association with health could vary according to the period of life considered (i.e., middle age, retirement period, .. oldest old) (26). The assessment of social participation is included in tools like WHODAS 2.0. Other existing tools for the assessment of social participation (such as) will be reviewed for their validity, usability and applicability at various ages. A questionnaire on habitual physical activities (27)) for this age group (activity score) includes household, sporting and leisure activities (physically active or not).

d- Optional instruments

1- Chronic diseases

For non-communicable diseases and musculoskeletal disorders, we propose a simple question: “Did your doctor diagnose ...?” with a list of diseases and disorders with highest prevalence and/or chronic disease burden adapted to local needs. This also permits the derivation of co-morbidity indexes such as the Charlson index, which predicts the ten-year mortality from a list of 22 co-morbid conditions (28). Other co-morbidity indexes include the Cumulative Illness Rating Scale (CIRS) that takes into account disease severity (29), the Index of Coexisting Disease (ICED) (30) or the Kaplan-Feinstein Classification (31). The Charlson Index has excellent reliability and the others acceptable reliability (31).

For mental health diseases, ESEMeD (European Study of Epidemiology of Mental Disorders) (32), Euro-D scale (33) or the major mental health measures (CIDI-Composite International Diagnostic Instrument (34) and the SCID (Structured Clinical Interview Diagnosis)) are too long and cumbersome to be used efficiently. There are effective alternatives of self-reported measures such as the PROMIS Emotional Item Short Forms (Depression, Anxiety and Rage) (35), the PHQ-9, for Depression (9 items), the GAD-7 for Anxiety (7 items) (36), as well as the K-10 and K-6 (37) for general psychopathology. All these instruments have been translated, evaluated and calibrated in numerous European countries, and have shown satisfactory properties both in the general population and patients.

2- Lifestyle

Lifestyle includes diet, physical activity and personal risk factors (smoking, alcohol, intoxicants). Physical environment includes indoor (home) environment (mould/dampness, pets, exposure to

tobacco smoke (ETS)), outdoor environment (air pollution, noise, access to green spaces), smoking, alcohol and working environment).

For smoking, the ECRHS questionnaire (38) may be used. For other life style parameters, age-dependent questionnaires can be derived from the MeDALL core questionnaire (children) (39) and ECRHS (adults) (38). For alcohol, no current validated questionnaire exists, but a newly developed questionnaire is currently being tested from the European Social Survey (ESS) and the SHARE study.

As a modifiable factor, nutrition and diet are of major concern in the context of health preservation in ageing. Several methods are available to collect dietary data including dietary recalls, dietary records and semi-quantitative food frequency questionnaires (40). For logistic and timeframe purposes, a comprehensive evaluation of the overall dietary intakes using country-specific questionnaire is not possible, as the use of different questionnaires accounting for cultural specificities and different composition tables across countries requires new validation and calibration studies. The GA²LEN (40) or the SHARE questionnaires (questions BR026 and others, www.share-project.org) may be used. In old age adults, the Mini Nutritional Assessment is of interest (41, 42).

3- Working environment:

Work exposures can be categorized in 3 main domains: psychosocial factors, biomechanical factors and chemicals. Here, we propose simple tools for broadly assessing exposure to these factors as an additional list of questions.

Psychosocial factors at work: Job strain: The two prominent models in the domain of stressful working conditions are the job strain model (43) and the effort–reward imbalance (ERI) model (44). We propose to use the short version of the ERI questionnaire (16 items) which was validated in different European cohorts (45).

Biomechanical factors: Exposure to occupational biomechanical factors is a major source of musculoskeletal disorders and of physical impairment while ageing. Questions were validated in the Gazel cohort where a single-item measure asking individuals about perceived physical strain at work was an acceptable proxy for physical load as compared to measures of 38 occupational biomechanical constraints (46). The question is: “Do you find that your work is physically strenuous?” on a visual scale (0 to 8). Questions on low back pain are also important.

Chemicals: Exposure to chemicals in the workplace is very common among blue-collar workers. It shows long-term effects for various chronic diseases (cancer, cognitive functioning and other neurotoxic effects, respiratory diseases...). The accurate assessment of chemical exposure requires efforts far beyond those possible in most places.

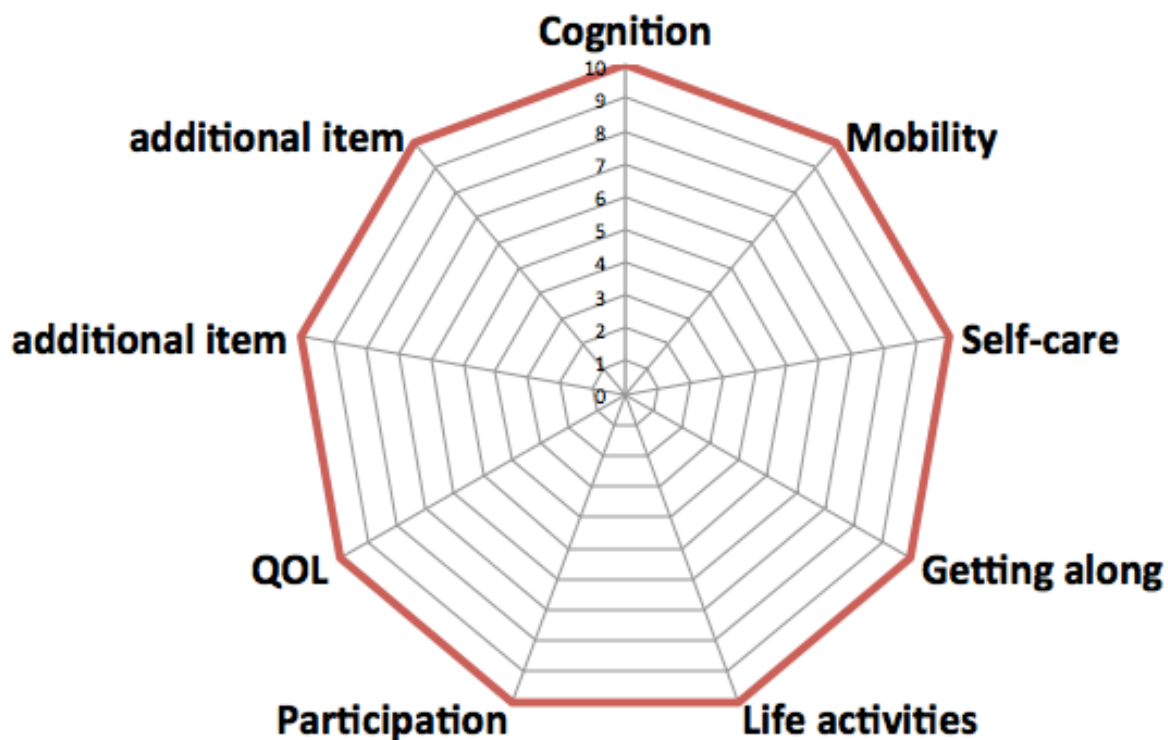
e- Optional questions

Optional questions can be added depending on specific local research interests and needs or target population. Additional items in psychosocial, work and social precariousness (47, 48) are not in the field of the WHODAS but may be often needed.

3- Reporting of the AHA questionnaire

A report of the AHA questionnaire is proposed in the form of a spider net (figure 2) to facilitate usual comparisons across individuals and groups of interest. The questionnaire should be considered as a screening for AHA. Depending on the impairment in the different items, a more extensive assessment is requested using specific instruments developed for the different items.

Figure 2: Reporting of the AHA questionnaire



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