

Review

Systematic review of meaning in life assessment instruments

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Abstract

Background: The construct of “meaning in life” (MiL) has raised the interest of clinicians working in psycho-oncology and end-of-life care. It has become a topic of scientific investigation where diverse assessment approaches have been applied. **Aims:** We present a comprehensive systematic review of existing MiL assessment instruments.

Methods: Electronic searches of articles published in English peer-reviewed journals were performed in Psycinfo, Medline, Embase and Cinahl. Instruments are appraised with regard to ten measurement properties.

Results: In total, 59 *nomothetic* and *idiographic* MiL instruments were identified. Most instruments were developed in North America and meet basic psychometric criteria. They assess presence of and search for MiL, crisis and sources of MiL, meaning making, meaningful activity, MiL in the context of illness, breadth, depth, and other structural indicators. These aspects are largely consistent with existing MiL definitions. Nine out of 59 instruments included cancer populations in test development.

Conclusions: This overview of available instruments underscores the complexity of the construct and might assist researchers to select an appropriate instrument for their research needs. Finally, it points to the need for more integrative theorizing and research on MiL.

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Introduction

The construct of meaning in life (MiL) has received increasing attention in many areas of psychology and medicine. It is defined in various ways [1,2], for example, as ‘the cognizance of order, coherence, and purpose in one’s existence, the pursuit and attainment of worthwhile goals and an accompanying sense of fulfilment’ ([3], p. 41). MiL is one of the most severely affected psychological domains in patients with terminal illness [4–8]. Although not an outcome in the traditional sense, MiL assessments have been included as indicators of (psychological) well-being in several studies, especially in psycho-oncology [9–17] and palliative care [18–22]. Although theoretical and empirical evaluations of a number of MiL measures have been published before [23–28], none of them have provided an exhaustive overview of all available measures, along with an attempt to identify the aspects they assess.

Objectives

The goal of this review is to provide a systematic compilation of existing measures of MiL along with information on test structure, length and basic psychometric

properties. Such a review may contribute to a more precise understanding of the construct. It may help to delineate more clearly how researchers conceptualize the construct and assist researchers in selecting an appropriate instrument, instead of developing ad hoc measures.

Specifically, the following research questions will be addressed: (i) how many instruments assess MiL; (ii) which aspects of MiL are assessed; (iii) what is the structure of MiL instruments (e.g. unidimensional vs. multidimensional); and (iv) to what extent do MiL instruments meet various psychometric criteria (i.e. objectivity, reliability). A detailed analysis of all the validity evidence available for each instrument is outside the scope of this review, as is an integration of underlying theories of MiL. Nevertheless, we provide a synopsis of instrument quality based on the identified key publication with regard to several appraisal criteria (test development, psychometric properties) including validity information.

Methods

Procedure

The review was limited to materials published in English peer-reviewed journals. Information from grey

literature (e.g. dissertations, book chapters and manuals) was not included because of its limited accessibility. Two searches were carried out: search 1 was completed in January of 2010. Titles and abstracts of all identified publications were reviewed in detail to identify all articles describing the *development or use* of an instrument assessing MiL. Key references were retrieved, and frequency of use was recorded for each instrument. Search 2 was completed in January 2011 to update the previous results. Additional publications were reviewed for articles describing the *development* of new MiL instruments. Ambiguities regarding instrument inclusion were resolved in consultation with co-authors.

Databases, time periods and search terms

Publications from four electronic databases from their inception up to January 2010 (search 1) and from 2009 to January 2011 (search 2) were included: PsycINFO (1806–), Medline (1950–), Embase (1988–) and CINAHL (1988–). Variations of meaning terms were used identically in both searches as follows: meaning/ful adj3 life, purpose/ful adj3 life, sense adj3 life, personal adj3 meaning, meaning adj3 system, meaning/ful adj3 existence (the term 'adj3' stands for three arbitrary words between the target terms, as well as the reversed order).

Exclusion of instruments

To make the review feasible, inclusion of instruments was restricted in several ways. First, instruments purporting to foremost measure spirituality, religious attitudes, hope, hopelessness, emptiness, boredom, death anxiety, death attitudes, optimism, goals, values and growth were excluded. Even though these terms may constitute elements of MiL, the included instruments need to explicitly refer to 'meaning'. Second, multidimensional measures comprising a single subscale for the assessment of MiL were excluded. Third, approaches using up to several items for MiL assessment without reporting scale development (ad hoc measures) and purely qualitative approaches to MiL assessment were excluded.

Test criteria for meaning in life instruments

The general criteria of test construction and evaluation also pertain to the field of MiL measurement. Comprehensive lists were published to evaluate outcome measures in general [29,30] or health status and quality of life measures specifically [31]. Fitzpatrick *et al.* [29] have provided an in-depth discussion of eight criteria for the evaluation of patient-based outcome measures: appropriateness, reliability, validity, responsiveness, precision, interpretability, acceptability and feasibility. From these criteria, the included MiL instruments will be discussed with respect to reliability (internal consistency and retest reliability), interpretability/norms and validity (criterion and construct validity).

Appropriateness and feasibility can only be conclusively judged with regard to a specific research context, and acceptability, responsiveness and precision are, although important, rarely dealt with in test development publications. In addition to these properties, we assessed objectivity as a basic psychometric criterion, as well as several criteria with regard to instrument development. These are concept definition, development sample, item generation/selection and use of formal analysis in test development. Thus, each instrument is appraised with regard to 10 properties (labelled with capital letters), and a total score (possible range 0–1) is provided. It has to be stated clearly that for the previously mentioned reasons, only information from the identified primary publication was used to arrive at the appraisals. It is obvious that consequent publications could alter some of these appraisals, as they may provide additional information on instrument properties. An exception was made with regard to construct validity: all publications identified in search 1 were consulted to determine whether at least two independent author groups have provided evidence for construct validity.

The developed criteria to achieve a positive appraisal for each property were based on Terwee *et al.* [32] and are stated in the respective Results section. It should be noted that the total score assigned to each instrument combines different aspects that are not necessarily equivalent in their importance. Their particular relevance varies with the individual research context and needs for which an instrument is intended. Thus, an instrument with an overall score of 0.50 may be more suited for use in a particular context than an instrument with a score of 0.70 or 0.80.

Presentation of results

Meaning in life instruments were classified into three subgroups according to their methodological approach and dimensionality. Tables 1 and 2 present instruments applying a purely quantitative/deductive approach (*nomothetic*), whereas Table 3 presents those with an inductive/combined approach, where instruments elicit free or semi-structured responses that are then categorized or rated to allow for quantitative comparisons (*idiographic* approach) [33]. For ease of presentation, we additionally differentiate *unidimensional* (Table 1) and *multidimensional* (Table 2) measures within the group of *nomothetic* measures. Properties of the reviewed instruments are summarized in the Results section.

Results

Number of hits and identified instruments

The search terms generated 4858 hits in search 1 and 2451 additional hits in search 2. Following the guidelines outlined in the Methods section, a total of 59 MiL instruments were included. Figure 1 shows the number of new instruments published per decade starting from 1960.

Table 1. Unidimensional nomothetic meaning in life instruments (N = 25)

| Instrument ^a | Aspect ^b A | B Development sample | C D | Instrument structure ^c | E F G Reliability ^d | H Interpretability ^e | I J | Sum ^f Score ^g |
|---|---|----------------------|---|-----------------------------------|---|---|-------|-------------------------------------|
| Constructed Meaning Scale (CMS) Fife, 1995 [38]** <5 | IL + USA (+) N = 422 cancer patients Age: 18–80 years | | + + 8 (1–4) | | + IC: 0.81 (F+) (G–) | M, SD of subgroups (+) | – + | 8.0 0.80 |
| Engagement in Meaningful Activities Survey (EMAS) Goldberg et al. (2002) [56]** <5 | MA + USA (–) N = 32 mental illness patients Age: 27–64 years | | + + 12 (1–5) | | + IC: 0.84 (F+) Retest (2–10 weeks, N = 15): 0.69 (G–) | M, SD, range (+) | – + | 7.0 0.70 |
| 'Existential issues' la Cour, 2008 [42]* <5 | IL – Denmark (+) N = 480 hospital patients Age: 16–89 years | | – – 5 (3-point, 4-point, yes/no) No scale scores | | + F/N/A (G–) | N/R (–) | – – | 2.0/9 0.22 |
| Existential Loneliness Questionnaire (ELQ) Mayers et al., 2002 [46]** <5 | IL + USA (–) N = 47 HIV-infected women Age: 22–48 years | | + + 22 (1–6) | | + IC: 0.90 (F+) (G–) | M, SD, range (+) | + +/– | 7.5 0.75 |
| Existential Meaning Scale (EMS) Lyon and Younger, 2005 [44]** <5 | PR + USA (+) Three samples (total N = 414): doctoral students, convenience sample, HIV patients | | + + 10 (1–5) | | + IC: 0.83–0.85 (F+) (G–) | M, SD, range, mode, kurtosis, skewness (+) | + +/– | 8.5 0.85 |
| 'Expressions of Life Meaning' Lavery et al., 2005 [43]** <5 | CP + Canada (+) N = 132 undergraduate students Mean age: 23 years | | – – 40 (1–5) | | + F/N/A (G–) | M, SD for each item by subgroups (+) | – – | 4.0/9 0.44 |
| General Life Purpose Scale (GLPS) Byron and Miller, 2009 [35]** <5 | PR + USA (+) N = 103 university students Age: 18–23 years | | – + 15 (1–7) | | + IC: 0.91 (F+) Split-half: 0.83 (G–) | M, SD, total and by gender (+) | – +/– | 6.5 0.65 |
| Life Engagement Test (LET) Scheier et al., 2006 [49]** <5 | PR + USA (+) Eight samples (total N = 2076): young adults, middle-aged women, osteoarthritis patients and spouses, breast cancer patients, undergraduate students | | – + 6 (1–5) | | + IC: 0.72–0.87 (F+) Retest (4 months, four samples N = 55 to 178): 0.61–0.76 (G+) | M, SD (+) | + +/– | 8.5 0.85 |
| Life Purpose Questionnaire (LPO) Hutzell and Peterson, 1986 [41]** <20 | PR + USA (+) Three samples (total N = 220): male alcoholism patients Age: 23–69 years | | – – 20 (agree/disagree) | | + (F–) Retest (1 week): 0.90 (G–) | M, SD, range, cut-off scores (+) | + + | 6.0 0.60 |
| LOGO Test Lukas, 1986 [97] as cited in [47] <5 German → Spanish, Hungarian | CR – Spain (–) Four samples (total N = 158): drug-abuse patients Age: N/R | | – – N/R | | + (F–) (G–) | M, SD by patient subgroups and for Spanish normative sample (+) | – + | 2.0 0.20 |
| Meaning in Life Index (MILL) Francis and Hills, 2008 [39]** <5 | PR + UK (+) N = 501 undergraduate students Age: 18–40 years | | – + 9 (1–5) | | + IC: 0.88 (F+) (G–) | M, SD, range (+) | – +/– | 6.5 0.65 |
| Meaning in Life scale Thompson et al., 1989 [50] <5 | IL + USA (–) N = 40 post-stroke patients and N = 40 main caregivers Age: 21–81 years | | – – 11 (4-point) | | + IC: 0.78 (F+) (G–) | M, SD (+) | – + | 5.0 0.50 |

| | | | | | | | | | | | | |
|--|----------|---|--|---|---|---|---|--|--|------|-------|------|
| Meaning in Life (ML) Scale and Uniscale Warner and Williams, 1987 [51]* <5 English/French | IL | + | Canada (+) Three samples (total N = 673): chronically or terminally ill patients Age: up to 65, 65–74, 75+ years | + | – | 15 (1–5) + visual analogue scale | + | IC: 0.78 (F+) Retest (2 weeks, N = 22): ML scale: 0.73; Uniscale: 0.59 (G+) | M, SD, MD, range, frequency distribution of items and uniscale (+) | + /– | 8.5 | 0.85 |
| Meaning-Making Scale van den Heuvel et al. (2009) [55]* Dutch | MM | + | Netherlands (+) N = 58 health care workers and N = 180 employees | + | + | 7 (1–6) | + | IC: 0.78 (F+) (G–) | M, SD (+) | + /– | 8.5 | 0.85 |
| Meaningful Activity Participation Assessment (MAPA) Eakman et al., 2010 [53]* | MA | + | USA (+) N = 154 older adults Age: 65–100 years | + | + | 28 activity items Rated for time spent (0–6)/ meaningfulness (0–4) | + | IC: 0.85 (F+) Retest (2 weeks, N = 25): 0.84 (G–) | M, SD, range (+) | + /– | 8.5 | 0.85 |
| Measure of Mundane Meaning (MMM) Brown et al., 2008 [34] <5 | PR | + | UK (–) Three trauma samples (total N = 129, qualitative only) and N = 38 undergraduate students Age: 18–46 years | + | – | 27 (N/R) | – | IC: 0.96 (F+) (G–) | N/R (–) | + /– | 4.5 | 0.45 |
| Perceived Personal Meaning Scale (PPMS) Wong, 1998 ([98], as cited in [48]) <5 | PR | + | USA (+) N = 172 cancer survivors Mean age: 45.2 years | – | – | 5 (1–10) | – | IC: 0.92, 0.89 (F+) Retest (N = 172, 1 year): 0.38 (G–) | M, SD (+) | + /– | 5.5 | 0.55 |
| Purpose in Life Test (PIL) Crumbaugh and Maholick, 1964 [37]** >50 (~300) → German, Chinese, Japanese, Hungarian, Polish, Swedish | PR | + | USA (+) Five samples (total N = 225): psychiatric and alcoholism patients, undergraduate and graduate students, junior league females Age: 17 to over 50 years | + | – | Part A: 20 (1–7) | + | IC: 0.90 (F+) (G–) | M, SD, percentiles, cut-off scores (+) | + | 8.0 | 0.80 |
| Questionnaire for Eudaimonic Well-Being (QEWB) Waterman et al., 2010 [54]** | WB | + | USA (+) Two samples (N = 1728, N = 5606, total N = 7334): college and university students Mean age: 20 years | + | + | 21 (0–4) | – | IC: 0.86/0.85 (F+) (G–) | M, SD, median, mode, kurtosis, skewness (+) | + /– | 7.5 | 0.75 |
| Questionnaire on Meaning Wheeler, 1993 [52]* <5 | CR | + | USA (+) N = 203 bereaved parents Age: 22–83 years | – | – | 5 (5-point) No scale scores | + | F N/A (G–) | Percent agree/neutral/disagree provided for each item (+) | – | 4.0/9 | 0.44 |
| Search for Meaning Survey Taylor, 1993 [10] <5 | SE IL | – | USA (–) N = 74 patients with recurrent cancer Mean age: 53.7 years | – | – | only two of unknown number of items described (yes/no, 4-point) | + | (F–) (G–) | N/R (–) | – | 1.0/9 | 0.11 |
| Seeking of Noetic Goals Test (SONG) Crumbaugh, 1977 [36] <20 | SE | + | USA (–) Seven patient groups (total N = 420), three student groups (total N = 206) Age: N/R | – | – | 20 (1–7) | + | IC (odd-even): 0.71 (F+) (G–) | M, SD, cutting score (+) | – | 5.0 | 0.50 |

Table 1. Continued

| Instrument ^a | Aspect ^b A | B Development sample | C D | Instrument structure ^c E | F G Reliability ^d | H Interpretability ^e | I J | Sum ^f Score ^g |
|--|--|----------------------|--------------|--|--|---------------------------------|-------|-------------------------------------|
| Self-transcendence Meaning of Life Scale (STMS) Li, 2002 ([99], as cited in [40]) <5 Chinese | PR + China (+) N = 788 undergraduate students Age: 17–22 years | | – – 8 (1–4) | + IC: 0.79 (F++) (G–) | N/R (–) | – – | – – | 4.0 0.40 |
| Sources of Meaning Profile (SOMP) Reker, 1988 ([100], as cited in [57]) <20 → Hebrew | PR + Canada, Australia (+) SO N = 298 community-residing Canadians, BR N = 461 Australian adults Age 18–83, 18–91 years | | – – 16 (1–7) | + IC: 0.77–0.78 (F+) Retest (3 months, N = 45): greater than 0.70 (G–) | M for various age groups, SD, by item and total scale (+) | – + | – + | 6.0 0.60 |
| Spiritual Meaning Scale (SMS) Mascaro et al., 2004 [45] <5 | PR + USA (+) N = 465 undergraduate students Mean age: 19.1 years | | + + 14 (1–5) | + IC: 0.89 (F+) (G–) | M, SD by sociodemographic characteristics (+) | + +/– | + +/– | 8.5 0.85 |

Objectivity is not reported for nomothetic measures but assumed to be sufficient because of their standardized format.

N/A, not applicable; N/R, not reported; Appraised instrument properties (for description of criteria see respective results section); A, concept definition; B, development sample; C, test construction; item generation/selection; D, test construction; formal analysis; E, objectivity; F, internal consistency; G, retest reliability; H, interpretability; I, criterion validity; J, construct validity (for this property only, additional publications were consulted; extended reference list is available from the first author); +, satisfactory; –, not satisfactory, +/- somewhat satisfactory (J only).

^aInstrument name (abbreviation), instrument author, key reference, asterisks indicate whether a copy of the instrument was available in key reference (full copy of the instrument; *items and scaling information provided), Frequency of instrument use in search 1 results was categorized: below five times (<5), up to 20 times (<20), up to 50 times (<50) or more. Language in which instrument was developed (only stated if not in English), and → identified translations.

^bAssessed aspects of MIL were determined by examining the instrument goals and looking at the items (bottom up approach); BR, breadth; CH, changes; CO, commitment; CP, concept; CR, crisis; DE, depth; EV, evaluative; FR, framework; IL, illness context; MA, meaningful activity; MM, meaning-making; PR, presence; SE, search; SO, sources; STR, structure; TE, temporal; WB, well-being.

^cItem number (response scale format), if applicable number and name of subscales (items per subscale), for idiographic measures: number, type and name of result categories.

^dIC, internal consistency; Retest, retest reliability (testing interval, sample N) as correlation coefficient or in percent of equivalent responses.

^eM, mean; SD, standard deviation; MD, median.

^fSum of positively appraised instrument properties (out of ten, unless stated otherwise).

^gThe final score is the sum of positive appraisals divided by applicable instrument properties (A–J), possible range 0.00–1.00.

^hIntrater agreement in percent, κ (=Kappa) or correlation coefficients.

Table 2. Multidimensional nomothetic meaning in life instruments (N = 23)

| Instrument ^a | Aspect ^b | A | B | Development sample | C | D | Instrument structure ^c | E | F | G | Reliability ^d | H | Interpretability ^e | I | J | Sum ^f | Score ^g |
|--|---------------------|---|--|--------------------|---|---|---|---|--|---|--------------------------|--|-------------------------------|-----|-----|------------------|--------------------|
| Daily Meaning Scale (DMS) Kashdan and Steger, 2007 [62]** <5 | PR SE | + | USA (-) N = 97 undergraduate students Mean age: 19.8 years | - | - | - | 4 (1-7), two subscales Daily meaning (2) Daily search for meaning (2) | + | (F-) Reliability estimate (1 day, N = 97): 0.97-0.98 (G+) | | | M, SD, range (+) | - | + | 5.0 | 0.50 | |
| Existence Scale (ES) Längle et al., 2003 [67]** <5 German → Slovak | PR | + | Austria (+) N = 1028 adults N = 60 inpatients Age: 18-69 years | + | - | - | 46 (1-6), four subscales: P-factor: Self-distance (8) Self-transcendence (14) E-factor: Freedom (11) Responsibility (13) | + | IC: 0.70-0.84 for subscales, 0.87-0.93 P-/E-factor and total scales (F+) (G-) | | | M for subscales and total scale (-) | - | + | 6.0 | 0.60 | |
| Impact of Cancer (IOC) Zebrack et al., 2006 [80]** <5 | IL | + | USA (+) N = 47 and N = 193 cancer survivors Mean age: 61.5 years | + | - | - | 41 (1-5), 10 subscales: Physical: health awareness (4), body changes (5) Psychological: positive self-evaluation (8), negative self-evaluation (4) Existential: positive outlook (3), negative outlook (4) Social: life interferences (3), value of relationships (2) Meaning of cancer (5) Health worry (3) | + | IC: 0.67-0.99 (F-) (G-) | | | M, SD, range for each subscales (+) | - | +/- | 5.5 | 0.55 | |
| Kunzendorf No Meaning and Negative Meaning Scales (NoM & NeM) Kunzendorf et al., 1995 [66]** <5 | PR CR | - | USA (-) N = 177 psychology students Age: N/R | - | - | - | 36 (1-4), two subscales: No meaning (18) Negative meaning (18) | + | IC: 0.89 each (F+) (G-) | | | M, SD (+) | - | + | 4.0 | 0.40 | |
| Life Attitude Profile (LAP), incl. Personal Meaning Index (PMI) Reker and Peacock, 1981 [73]** <50 → German, Slovak, Turkish | PR SE CR | + | Canada (+) N = 219 undergraduate students Mean age: 21.6 years | - | - | - | 44 (1-7), seven subscales: Life purpose (9) * Existential vacuum (7) * Life control (6) Death acceptance (6) * Will to meaning (6) Goal seeking (5) * Future meaning to fulfil (5) | + | IC: 0.55-0.83 (F-) (G-) | | | M, SD by gender, subscales and total score (+) | - | + | 5.0 | 0.50 | |
| LAP-Revised [101] | | + | Australia (+) N = 524 homeless, at-risk and non-homeless adolescents Age: 14-17 years | - | + | - | 48 (1-5), six subscales (8 items each): Four * scales from above, plus: Coherence Choice/Responsibleness | + | IC: 0.77-0.87 (F+) Retest (4-6 weeks, N = 200): 0.77-0.90 (G+) | | | M, SD for subscales by group (+) | - | + | 8.0 | 0.80 | |
| Life Attitude Scale for Elderly with Chronic Disease (LAS) Liu, 2001 [69]** <5 Chinese | PR CR | + | China (+) N = 48 and N = 663 patients with chronic disease Age: 65-95 years | + | + | - | 20 (1-4), six subscales: Congeniality of family life (4) Life meaning (4) Dignity of life (3) | + | IC (N = 148): 0.89-0.93 (F+) Retest (2 weeks, N = 37): 0.87-0.96 (G-) | | | M, SD, range (+) | - | + | 7.0 | 0.70 | |

Table 2. Continued

| Instrument ^a | Aspect ^b | A | B | Development sample | C | D | Instrument structure ^c | E | F | G | Reliability ^d | H | Interpretability ^e | I | J | Sum ^f | Score ^g |
|--|---------------------|---|--|--------------------|---|---|--|---|---|---|--------------------------|--|-------------------------------|-----|---|------------------|--------------------|
| Life Esteem Survey (LES) Wheeler et al., 1990 [79] <5 | FR | + | USA (+) N = 115 undergraduate students Mean age: 21 years | – | – | – | Struggle with adversities (3) Hollow existence (3) Destiny of life (3) 30 (1–5), three subscales: Framework Perspective Commitment | + IC: 0.61–0.78 (F–) Retest (interval and N not stated): 0.61–0.81 (G–) | | | | M, SD for high and low well-being groups (+) | – | +/- | – | 4.5 | 0.45 |
| Life Evaluation Questionnaire (LEQ) Salmon et al., 1996 [74]* <5 | IL | + | UK (+) N = 124 and N = 76 incurable cancer patients Age: up to 50, 50–65, 65+ years | + | – | – | 44 (0–6), five subscales: Freedom versus restriction (10) Appreciation of life (5) Contentment (8) Resentment (13) Social integration (8) | + IC: 0.70–0.85 (F+) Retest (2–3 days, N = 40): 0.77–0.92 (G–) | | | | M, SD, range by age groups (+) | – | +/- | – | 6.5 | 0.65 |
| Life Meaningfulness Scale (LMS) Halama, 2005 [60] <5 Slovak | PR | + | Slovakia (+) N = 149 university students and N = 67 elderly students Mean age: 21.6 years, 57.3 years | – | – | – | 18 (N/R), four subscales: Overall sense of meaning Cognitive Motivational Affective component | + IC: 0.87, 0.77 (F+) (G–) | | | | N/R (–) | + | +/- | – | 5.5 | 0.55 |
| Life Regard Index (LRI) Battista and Almond, 1973 [59]* <50 → Dutch, German, Slovak LRI-Revised [102] | PR | + | USA (–) N = 229 medical students Age: N/R + Netherlands (+) 3 samples (total N = 461) of university students and general population Age: 18–42 years, 22–88 years | – | – | – | 28 (1–5), two subscales: Framework (14) Fulfillment (14) + Changed item order and answer format (1–3) | + (F–) Retest (interval not stated, N = 30): 0.94 (G–) + IC: 0.75–0.91 (F+) Retest (5 weeks, N = 98): 0.73–0.80 (G+) | | | | M, SD, range (+) | + | + | + | 5.0 | 0.50 |
| Meaning in Life Krause, 2004 [65]* <20 | PR | + | USA (+) N = 1518 older adults Mean age: 74.7 years | + | + | + | 14, later 8 [103] (1–4), four subscales: Values (3) Purpose (4) Goals (3) Reflection on the past (4) | + IC estimates: 0.86–0.93 for four aspects and total scale (F+) (G–) | | | | M, SD, range (+) | – | +/- | – | 7.5 | 0.75 |
| Meaning in life Tomich and Helgeson, 2002 [78] <5 | IL | + | USA (+) N = 164 breast cancer patients and N = 164 age-matched women Age: 26–84 years | – | + | – | 20 (1–5), five subscales/indicators: Search for meaning (2) Benefit (1) Harm (1) Personal growth (9) Acceptance (7) | + IC: 0.86–0.89 for attitude/behaviour subscales (F+) (G–) | | | | M by groups (–) | – | +/- | – | 5.5 | 0.55 |
| Meaning in Life Questionnaire (MLQ) Steger et al., 2006 [77]** <50 → Japanese, Spanish | PR | + | USA (+) Four samples (total N = 775) of undergraduate and college students and N = 252 informants Mean age: 19.7–21.8 years, informants 26.5 years | + | + | + | 10 (1–7), two subscales: Presence of ML (5) Search for ML (5) | + IC: 0.81–0.92 (F+) Retest (1 month, N = 70): 0.70, 0.73 (G+) | | | | M, SD, shape, variability (+) | + | + | + | 10.0 | 1.00 |

| | | | | | | | |
|--|----------|--|---|---|---------------------------|-----------|------|
| Meaning in Life Questionnaire (MILQ) Kernes and Kinnier, 2008 [63]* <5 | PR SO | + USA (+) N = 175 psychologists Age: 26–64 years | + - 28 (1–7), 2 subgroups of items (no scale scores): Cosmic meaning (12) Terrestrial meaning (16) | + F N/A Retest (2 weeks, N = 52, item level mean correlation): 0.68, 0.76 (G–) | M, SD (+) | - - 5.0/9 | 0.56 |
| Meaning in Life Scale (MILS) Jim et al., 2006 [61]** <5 | IL CR | + USA (+) N = 167 breast cancer survivors and N = 384 cancer survivors Mean age: 50–51 years | + + 21 (1–6), four subscales: Harmony and peace (4) Life perspective, purpose and goals (7) Confusion and lessened meaning (7) Benefits of spirituality (3) | + IC: 0.84–0.93 (F+) Retest (2 weeks, N = 38): 0.67–0.81 (G–) | M, SD (+) | - +/ - | 0.75 |
| Meaning in Suffering Test (MIST) Starck, 1983 [76]** <5 | IL | + USA (-) N = 99 hospitalized patients (psychiatric or somatic) Age: 26–86 years | - - 20 (1–7), three subscales: Subjective characteristics of suffering (6) Personal responses to suffering (8) Meaning of suffering (6) + Numeric Rating Scale for suffering (1–10) | + (F–) (G–) | M, SD, range (+) | - + 4.0 | 0.40 |
| Meaningful Life Measure (MLM) Morgan and Farsides, 2009 [70]** <5 | PR | + UK (+) 3 samples (total N = 502): adults, undergraduate students, online respondents Mean age: 32, 22, 29, 15–75 years | + + 23 (1–7), five subscales: Purposeful life (4) Valued life (4) Accomplished life (5) Principled life (5) Exciting life (5) | + IC: 0.85–0.88 (F+) Retest (6 months, N = 38): 0.65–0.70 (G–) | N/R (-) | - +/ - | 0.65 |
| Orientations to Happiness Scale Peterson et al., 2005 [72]* <20 → German | PR | + USA (+) N = 180 and 845 adults (internet respondents) Age: 18–65+ years Canada (+) N = 160 university students Age: 18–25 years | + + 18 (1–5), three subscales: Life of meaning (6) Life of pleasure (6) Life of engagement (6) - - 57 (1–7), total score and seven subscales: Achievement Relationship Religion Self-transcendence Self-acceptance Intimacy Fair treatment | + IC: 0.72–0.82 (F+) (G–) | M, SD, skewness (+) | - + 8.0 | 0.80 |
| Personal Meaning Profile (PMP) Wong 1998 [98], as cited in [64] <20 → Chinese, Dutch | PR SO | + Canada (+) N = 160 university students Age: 18–25 years | - - 57 (1–7), total score and seven subscales: Achievement Relationship Religion Self-transcendence Self-acceptance Intimacy Fair treatment | + IC: 0.54–0.91 for subscales (F–) (G–) | M, SD for total score (+) | - + 5.0 | 0.50 |
| Sense Making Scale (SMS) Pakenham, 2007 [71]* <5 | IL | + Australia (+) N = 388 multiple sclerosis patients and N = 232 caregivers Mean patient age: 49.3, 21–80 years | + + 38 (1–5), six subscales: Redefined life purpose (11) Spiritual perspective (8) Causal attributions (7) Changed values and priorities (6) Acceptance (4) | + IC: 0.73–0.91 (F+) (G–) | M, SD (+) | - +/ - | 0.75 |

Table 2. Continued

| Instrument ^a | Aspect ^b | A | B | Development sample | C | D | Instrument structure ^c | E | F | G | Reliability ^d | H | Interpretability ^e | I | J | Sum ^f | Scores ^g |
|--|---------------------|---|---|--------------------|---|---|--|---|---|---|--------------------------|--|-------------------------------|---|---|------------------|---------------------|
| Sources of Life Meaning (SUM) Prager et al., 2000 ([104], as cited in [58]) <5 Hebrew/Arabic | PR SO | + | Israel (+) N = 362 Arab and Jewish men and women Age: 20–40, 60+ years | | – | + | Luck (2) 41 (1–5), total score and 11 subscales: Family/communal values (6), materialistic concerns (5), autonomy and independence (5), interpersonal relationships (4), communal activity (3), attainment of tranquility (3), self-development and leisure (3), family relationships (2), leisure activities with others (2), being with animals (1), good relationship with spouse (2) | + IC: 0.65–0.85 for subscales and total score, $r = 0.31$ – 0.74 for two item scales (F–) Retest (2–4 weeks, N = 64): 0.77 for total scale (G+) | | | | M by gender; ethnicity and age group (–) | – | – | – | 5.0 | 0.50 |
| Sources of meaning and meaningfulness questionnaire (SoMe) Schnell and Becker, 2009 [75] <5 German | PR CR SO | + | Germany (+) N = 603 representative population sample Age: 16–85 years | | + | – | 151 (0–5), two overall scores and 26 subscales: Meaningfulness (5) Crisis of meaning (5) 26 sources of meaning: Self-transcendence (five subscales): Vertical: Explicit religiosity, spirituality Horizontal: Social commitment, unison with nature, self-knowledge, health, generativity Self-actualisation (eight subscales): challenge, individualism, power; development, achievement, freedom, knowledge, creativity Order (four subscales): tradition, practicality, morality, reason Well-being and relatedness (seven subscales): community, fun, love, comfort, care, attentiveness, harmony | + IC: 0.65–0.95 for the scales, 0.83–0.93 for the dimensions (F–) Retest (2 months, N = 603): average of 0.81 for the scales, 0.90 for the dimensions Retest (6 months, N = 603): 0.72 for scales, 0.78 for dimensions, 0.48 for crisis of meaning (G+) | | | N/R (–) | – | +/– | – | – | 5.5 | 0.55 |
| Valuation of Life Scale (VOL) Lawton et al., 2001 [68]* <5 → German | PR CR | + | USA (+) Four samples (total N = 1928): healthy and chronically ill seniors Mean Age: 75.7–80.6 years | | + | + | 19 (1–5), total score and two subscales: Positive valuation of life (13) Negative valuation of life (6) | + IC: 0.94, 0.83 (F+) (G–) | | | | M, SD by subscale (+) | + | + | + | 9.0 | 0.90 |

For notes, see Table 1.

Table 3. Idiographic meaning in life instruments (N = 11)

| Instrument ^a | B Development | | | | Items/categories ^c | E Objectivity ^h | F G Reliability ^d | H Interpretability ^e | I J | Sum ^f | Score ^g |
|---|---------------------|-------------|--|-------------|--|---|--|--|----------|------------------|--------------------|
| | Aspect ^b | A | C | D | | | | | | | |
| Experienced Meaningfulness and Meaninglessness Questionnaire (EMF/EML) Debats et al., 1995 [85]* <5 Dutch | PR CR | + - | N/A N/A | N/A N/A | Two open questions (meaningful/meaningless situation) Content categories: Situation (period, people, activity, well-being); Process (self, other; world by positive/negative and giving/receiving/sharing); Extent of meaning through coping with crisis | Situation main and subcategories: 72–100% Process: main category: 71–92%, subcategories: 29–100% (+) | F N/A (G-) | % of codings by category (+) | + +/- | 5.5/7 | 0.79 |
| Fulfillment of Meaning Scale (FOM) Burbank, 1992 [82]** <5 | PR FR SO | + - - | USA (-) N = 81 seniors Age: 63–88 years | + - - | 12 items (0–4, single scale) + open framework question Content categories (8): Relationships, service, religion, activities, living/growth, home, health, learning Two items (5-point) + four open questions Categories: Reasons for meaning in life (8): human relationships, religion, reasons relating to life, hobby/work, health/functioning, psychological well-being; cannot say other; Sources of strength in life (8): Categories from above + material well-being; | Items: given Content categorization: Independently by two researchers (-) | IC: 0.89 (F+) (G-) | M, SD, range, low/medium/high score; % of most important category (+) | + +/- | 5.5 | 0.55 |
| Interview on Meaning in Life Takkinen and Ruoppila, 2001 [91]* <5 Finnish | PR CH SO | + - - | Finland (+) Three samples (total N = 559) of seniors Age: 65–69, 83–92 years | - N/A | Reasons for meaning in life (8): human relationships, religion, reasons relating to life, hobby/work, health/functioning, psychological well-being; cannot say other; Sources of strength in life (8): Categories from above + material well-being; | Items: given Categories: 86% (+) | F N/A (G-) | % for each response option or category by subgroups (+) | - +/- | 4.5/8 | 0.56 |
| Meaning Essay Document (MED) DeVogler and Ebersole, 1980 [83]* <20 → Spanish | SO DE | - - | USA (+) N = 100 and 106 undergraduate students Mean age: 18–19 years | N/A N/A | Meaning of death: positive, negative, neutral One open question (three most important meanings) Content categories (8): Understanding, relationship, service, belief, expression, obtaining, growth, existential-hedonistic | Content categorization: 86% (+) | F N/A Retest (3 months, N = 55): identical main category proportion 0.49; same category only, 0.73 (G+) | % of meanings in each category (not by respondent) (-) | - +/- | 3.5/7 | 0.50 |
| Later extended; Meaning in Life Depth (MILD) [105] | | - | USA (-) N = 86 undergraduate students Age: late teens | N/A N/A | Two open questions ('thing that gives greatest meaning'; 'why you think your meaning is deep or not deep') Depth categories (5): From 'little or no depth' to 'highest depth' | Depth rating: r = 0.78–0.84 (+) | F N/A (G-) | % of meaning by category; frequency of meaning depth predetermined (-) | - - | 1.0/7 | 0.14 |
| Meaning of Illness (MOI) Degner et al., 2003 [86] <5 | IL | + | Canada (+) N = 1012 women with breast cancer Mean age: 58.3, 59.5 years | + N/A | Choose one of eight cards presenting statements describing illness as positive (Challenge, Value), negative (Enemy, Punishment, Weakness, Irreparable loss) or other meaning (Relief, Strategy, or 'write-in' comments), give reasons for choice | Card selection: given; Qualitative section: N/A (+) | F N/A Retest (6 months, N = 180): 84.4% had stable category valence (G+) | N and % of women choosing specific meaning (+) | - + | 7.0/8 | 0.88 |

Table 3. Continued

| Instrument ^a | Aspect ^b | B Development sample | | | Items/categories ^c | E Objectivity ^h | F G Reliability ^d | H Interpretability ^e | I | J | Sum ^f | Score ^g |
|--|---------------------|----------------------|--|-----|---|---|---|--|-----|-------|------------------|--------------------|
| | | A | C | D | | | | | | | | |
| Personal Meaning Systems (PMS) Pohlmann et al., 2006 [90]* <5 German | SO | + | Germany (-) N = 30 | N/A | Two open questions (elements contributing to meaning/how are they related) | Content categorization: $\kappa=0.75-1$ | N/A (-) | - | +/- | 2.5/7 | 0.36 | |
| | STR | | theology and N = 29 science students Mean age: 24.4, 23.0 years | | Content categories (8): Relationships, life task, personal well-being, self actualization, service, beliefs, materiality, miscellaneous Structural indices (4): Accessibility, differentiation, elaboration, coherence | Coherence and integration: $\kappa=0.75 (+)$ | | | | | | |
| Questionnaire of Life Meaning Sources (QLMS) Halama, 2000 [89] <5 Slovak | SO | + | Slovakia (+) | - | 20 items (1-5) + open questions | Items and breadth indicators: given | N/R (-) | - | +/- | 2.5 | 0.25 | |
| | BR | | N = 166 adolescents Age: 17-19 years | | Three breadth indicators, depth rating (1-4); self-preoccupation, social support and searching for intimacy, self-realization, self-transcendence | Depth indicators: guidelines provided; Content categorization: N/R (-) | | | | | | |
| | DE | | | | | | | | | | | |
| Questions in Life Aulhagen, 2006 [81] <5 German | PR | + | Germany (+) N = 192 adults Age: 18-69 years | - | 40 items with open or closed response format, only partially described: One item each for the experience of ultimate, provisional, or personal meaning (1-4) + open questions | Closed response questions: given Content categorization: $z = 0.78-0.83 (+)$ | Split ballot technique for 1-item measures (F-) (G-) | % experiencing each meaning type; % of sources by meaning type (+) | - | - | 4.0 | 0.40 |
| | SO | | | | | | | | | | | |
| Schedule for Meaning in Life Evaluation (SMILE) Fegg et al., 2008 [88] <5 German/English → French | PR | + | Germany, Ireland (+) N = 401 German and 198 Irish students; N = 75 palliative patients Mean age: 24.3, 26.0, 62.0 years | N/A | Personal relationships, positive social behaviour, activities, obtaining goals, personal growth, well-being, life by itself, evolution, transcendence | Items: given Content categorization: coding scheme (-) | F N/A Retest (7 days, N = 342): 0.60-0.72, 85.6% of areas relisted (G-) | M, SD, frequencies (+) | - | +/- | 3.5/7 | 0.50 |
| | SO | | | | Quantitative indices (3): Importance, satisfaction, weighted satisfaction | | | | | | | |
| | BR | | | | Content categories (13): Family, work, leisure, friends, health, partner, finances, home/garden, spirituality, animals/nature, pleasure, altruism, well-being | | | | | | | |
| SELE-instrument Dittmann-Kohl and Westehof, 1997 [87]* <20 German → Dutch, English, French, Spanish | SO | + | Germany (+) N = 300 young and N = 300 elderly adults Age: 17-30, 60-90 years | + | 28 sentence stems (e.g. 'When I think about myself...') | Extensive coding scheme organized hierarchically and dimensionally, mean interrater agreement: 75%, 87% (+) | F N/A Retest (4 weeks, N = 17): level of codings: 68%, content category: 0.50-0.70, evaluative dimension: 0.85 (G-) | N/R (-) | - | +/- | 4.5/8 | 0.56 |
| | TE | | | | Psychological self, physical self, life in general, activities, social relations, material living conditions, societal living arrangements | | | | | | | |
| | EV | | | | Other categories: temporal (present, past, future, neutral), evaluative (positive, negative, neutral), person, modus, stability, change | | | | | | | |

| | | | | | | | | | | | | | |
|---|----------|---|---|-----|-----|--|--|---------------|--|---|-----|-------|------|
| Sources of Meaning Questionnaire (SOMQ) Debats, 1999 [84]* <5 Dutch | SO CO | + | Netherlands (+) N = 115 distressed and 169 nonpatient students Mean age: 23.1, 20.1 years | N/A | N/A | One open question and three commitment ratings (1–5) Content categories (7): Relationships, lifework, personal well-being, self-actualization, service, beliefs, materiality | Content categorization: coding scheme, $r = 0.91-0.93$ (+) | F/N/A (G-) | Frequency of each category (not by respondent); M, SD of commitment score by group (-) | - | +/- | 3.5/7 | 0.50 |
|---|----------|---|---|-----|-----|--|--|---------------|--|---|-----|-------|------|

For notes, see Table 1.

Meaning in life instruments

Of the 59 MiL instruments, 48 apply *nomothetic* measurement. Twenty-five of these [10,34–57] are unidimensional (Table 1), whereas 23 instruments [58–80] are multidimensional (Table 2). Eleven instruments [81–91] use an *idiographic* approach (Table 3). All instruments were developed for self-completion. However, with a simple change of instruction, proxy ratings can be assessed with most.

Instrument language, frequency of use and availability of instrument

Most instruments (41/59) were developed in English. Three instruments were developed simultaneously in two languages. Twelve instruments were used at least once in a language other than the original, but translation procedures are often not reported. Only 12/59 instruments have been identified five times or more in search 1 results. Full information on test instructions, items and scaling is not too frequent (15/59), whereas information on item wording and scaling is more common (43/59).

Definitions of the meaning in life construct (A)

Authors' definitions of MiL are not included in the tables but can be received from the first author on request. Criterion A indicates whether (+) a clear definition of the concept to be measured was provided or (-) definition was inadequate or lacking. Almost all instrument authors provided a satisfactory definition (54/59). The provided definitions are dependent on the specific aspects of MiL that the researchers focus on. Attempting to summarize their statements, they perceive MiL to be a highly individual [88] perception [37,44], understanding [59] or belief [39] about one's own life and activities [54] and the value [56] and importance [49] ascribed to them. Meaning and purpose are related to terms like order, fairness [50], coherence [61], values [65], faith [51] and belonging [75]. Some authors differentiate between meaning and purpose, the latter being more goal or action-oriented [35,49], whereas others use meaning and purpose interchangeably [50,51,73]. MiL comprises the engagement in or commitment to goals [79,84] or a life framework [59,82] and the subsequent sense of fulfilment [82] and satisfaction [64] or lack thereof. Some definitions refer to the absence, loss or crisis of meaning [34,37,52,75,85]. Instruments assessing MiL in illness capture a person's understanding of the implications of their illness for their life and identity [38,74,80].

Aspects of meaning in life

The identified instruments cover several aspects of the MiL construct. Thirteen of 59 instruments were explicitly developed in relation to an illness and are only applicable within this context (*illness* instruments) [10,38,42,46,50,51,61,71,74,76,78,80,86]. The most commonly assessed aspects in the remaining MiL

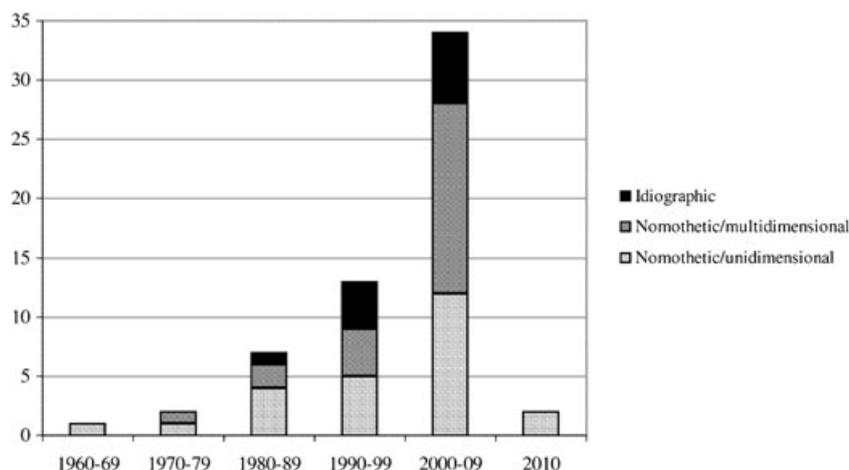


Figure 1. Number of new meaning in life instruments per decade (nomothetic = fully standardized approach; idiographic = individualized assessment approach)

instruments are *presence* (33/59), *sources* (14/59), *crisis* (9/59) and *search* (6/59). *Presence* refers to the assessment of the extent to which MiL is experienced by an individual. *Crisis* refers to assessments of lack or loss of MiL. *Sources* refer to specific areas that are relevant for a person's MiL, and *search* for meaning refers to the motivation and extent to which a person is looking to find MiL. Other aspects are addressed less often: *breadth* refers to the diversity of areas within which MiL is experienced (3/59), *depth* refers to the quality of these areas (2/59), *commitment* assesses specifically how dedicated a person is to various MiL areas (2/59). Other seldom measured aspects refer to the existence of a *framework* for the experience of MiL (3/59) and the extent to which a person is engaged in *meaningful activity* (2/59). Meaning as indicative of *well-being*, *meaning-making*, *concept*, *changes*, as well as *temporal*, *evaluative* and *structural* aspects were only assessed by one instrument each.

Populations (B)

Most of the presented instruments (37/59) have been developed in North America, 18 were developed in Europe and only four elsewhere. Out of a total of 26 patient populations, nine were patients with cancer. Eighteen instruments were developed using primarily student populations. Criterion B indicates whether the development sample was (+) described sufficiently (participant type and age) and $N \geq 100$ or (–) inadequately described or $N < 100$. Most instruments (48/59) fulfilled this criterion.

Test lengths and scale structure

Average item number for *unidimensional* instruments is 15 (range 5–40). With up to 20 items, 19/25 instruments are short to medium in length. Average item number of *multidimensional* instruments is 34 (range 4–151). With up to 30 items, 14/23 instruments are short to medium in length. The majority of multidimensional instruments comprise up to five subscales (16/23).

Whereas number of items to some extent indicate respondent burden for *nomothetic* measures, there is no corresponding indicator for *idiographic* instruments. Only 2/11 *idiographic* instruments provide information regarding respondent burden [88,90], none provide explicit information regarding administrative burden, which is often considerable in *idiographic* assessment.

Test construction (C, D)

Criterion C indicates whether (+) a clear description of the item generation/selection process is provided (e.g. interviews, expert or target group discussions, literature/theory analysis) or (–) the description is inadequate or lacking. Criterion D indicates whether (+) formal analyses procedures were applied in test construction: factor analyses performed on adequate sample size (N is seven times the number of items and ≥ 100), or item analysis, or item response theory/Rasch modelling; or (–) formal test analysis was inadequate or information was lacking.

For unidimensional *nomothetic* instruments, information on item generation/selection (C) was satisfactory for a slight minority of instruments (11/25), as was the case for formal analyses (D, 11/25). With respect to multidimensional *nomothetic* instruments, information on item generation/selection-fulfilled criterion C for a slight majority (13/23) and on formal analyses (D) were again sufficient for about half of the instruments (12/23).

For *idiographic* instruments, open questions may be judged as face-valid from reproduced questions for 5/11 instruments [83–85,88,90]. Criterion C only applies to the remaining six measures that include predefined items, of which three measures fulfilled the criterion. Criterion D was not fulfilled for the three *idiographic* measures for which it is applicable.

Objectivity (E)

Authors of *nomothetic* measures have not reported objectivity information, but these instruments can be considered sufficiently objective because of their

unambiguous response format (Likert scales). Thus, criterion E is automatically fulfilled for *nomothetic* instruments. For *idiographic* instruments, criterion E indicates whether scoring objectivity (+) is satisfactory because of kappa or Pearson coefficients ≥ 0.70 or percent agreement $\geq 70\%$ or (–) is insufficient because of kappa or Pearson coefficients < 0.70 or percent agreement $< 70\%$ or lacking information. While administrative objectivity is established via standardized instructions for all *idiographic* measures and coding schemes were developed to help with scoring objectivity for 10 instruments, interrater agreement (E) at satisfactory levels was reported for 8/11 instruments.

Reliability (F, G)

Internal consistency (IC) was usually reported using Cronbach's alpha. Retest reliability was most commonly expressed by Pearson correlation coefficients, although this approach may exaggerate reproducibility by not taking systematic differences into account [29]. Nunnally and Bernstein [92] esteem modest reliabilities of ≥ 0.70 as being sufficient in early stages of validation research, but recommend reliabilities of 0.80 for group research and of 0.90–0.95 if important decisions are to be made with respect to individual test scores. Criterion F indicates the extent to which items in a (sub-)scale are intercorrelated and thus measuring the same construct: it is rated (+) if Cronbach's alpha(s) are calculated per dimension/scale and are ≥ 0.70 and rated (–) if Cronbach's alpha(s) are < 0.70 or no information is provided. This criterion is not applicable to measures where scale scores are not intended.

Streiner and Norman state that a retest interval of 2–14 days is usual but acknowledge that 'expert opinions regarding the appropriate interval vary from an hour to a year' [93], p. 182]. Evaluation of appropriate levels of retest reliability needs to take into account the elapsed time period and the question whether respondents can be assumed to not have changed during that time [92]. There is evidence that MiL possesses a high trait-like stability (0.70 and higher) for periods up to several months [49,77,94] but is of moderate stability over longer periods (e.g. 0.40–0.50 over 1 year [95]) and also amenable to change [48]. Although they acknowledge that some researchers recommend sample sizes of 200 and more for reliability evaluation, Norman and Streiner argue that 50 subjects suffice in many situations [93]. Criterion G indicates the extent to which the same results are obtained on repeated administrations (when no change has occurred): retest reliability is rated (+) if Pearson r , intraclass correlation coefficients (ICC) or Kappa coefficients are ≥ 0.70 or percent agreement $\geq 70\%$ and $N \geq 50$ and elapsed time interval is stated and rated (–) if Pearson r , ICC or Kappa is < 0.70 or percent agreement $< 70\%$ or $N < 50$ or time interval is not stated or no information is provided.

Criterion F does not apply to three unidimensional *nomothetic* instruments because calculation of scale scores is not intended [42,43,52]. From the remaining

instruments, 19/22 report satisfactory values for Cronbach's alpha, whereas retest reliabilities were reported for only 7/25 instruments, with 2/25 fulfilling criterion F. The median elapsed time interval was 4 weeks (range 1 week–1 year). Sample sizes ranged from 15 to 221. In the group of multidimensional *nomothetic* instruments, criterion F is not applicable to one instrument because calculation of scale scores is not intended, but items are grouped to represent two separate domains [63]. Fifteen out of 22 instruments have acceptable reliabilities for all subscales, whereas five instruments have ICs lower than 0.70. Twelve out of 23 instruments provide information on retest reliability, of which six fulfil criterion G. The median elapsed time interval was 2–4 weeks (range 1 day–6 months). Sample sizes for retest reliability evaluation ranged from 37 to 603. In the group of *idiographic* instruments, criterion F is only applicable to the three instruments comprising rating scales. Out of these, one reported satisfactory internal consistency [82]. Four out of 11 studies report retest reliabilities, two of these fulfil criterion G. The median elapsed time interval was 8 weeks (range 1 week–6 months). Sample size varied greatly (17–342).

Interpretability/norms (H)

In published accounts of MiL instruments, detailed norms in the strict sense of the word are seldom reported. Criterion H is rated (+) if mean and standard deviation (SD) scores of at least one group are provided or frequencies are reported for *idiographic* measures and (–) if inadequate information is provided for interpretation. Twenty-one out of 25 unidimensional, 17/23 multidimensional *nomothetic* instruments and 6/11 *idiographic* instruments fulfil criterion H.

Validity (I, J)

For this review, criterion validity (I) and construct validity (J) were differentiated [29]. Criterion I was rated (+) if a correlation with another MiL instrument ('gold standard') of ≥ 0.50 was reported and rated (–) if such a correlation was < 0.50 or no information was provided. Criterion validity (I) was reported at satisfactory levels for 9/25 (unidimensional), 4/23 (multidimensional) and 2/11 (*idiographic*) instruments. A total of six additional instruments evaluated criterion validity but reported levels < 0.50 [54,57,62,67,84,88].

Criterion J relates to the extent to which scores on a particular questionnaire relate to other measures in a manner that is consistent with theoretically derived hypotheses concerning the concepts that are being measured: it was rated (+) if at least two studies from independent authors with hypotheses confirming results were identified within search 1; (+/–) indicates that one or more studies by a single author group with hypotheses confirming results was identified and (–) indicates that results were against hypotheses or no information on construct validity was provided. For criterion J only,

additional publications were consulted (not referenced here; extended reference list available from first author).

Construct validity (J) is the most frequently investigated aspect of validity in MiL research. Evidence for construct validity (from one or more author groups) was provided for most instruments: 20/25 unidimensional *nomothetic* instruments, 21/23 multidimensional instruments and 10/11 *idiographic* instruments. The stricter criterion for construct validity (J) (i.e. evidence from two independent author groups) was fulfilled for 8/25 unidimensional *nomothetic* instruments, 11/23 multidimensional instruments and only 1/11 *idiographic* instruments. More complex methods of analysis (like multi-trait–multi-method analysis) are rarely applied.

Total score of instrument quality (test development and psychometric properties)

The total score assigned to each instrument in the final columns of Tables 1–3 is the sum of positive appraisals divided by the number of applicable instrument properties (A–J, possible range 0–1). For unidimensional *nomothetic* instruments, it ranges from 0.11 to 0.85 ($M=0.61$, $SD=0.22$), for multidimensional *nomothetic* instruments from 0.40 to 1.00 ($M=0.64$, $SD=0.16$) and for *idiographic* instruments from 0.25 to 0.88 ($M=0.53$, $SD=0.18$).

For an overview of the distribution of final quality scores, instruments in each table were divided into three categories (low score: <0.50 , medium score: $0.50–0.70$ and high score: >0.70). In the group of unidimensional *nomothetic* instruments, 7/25 have low scores [10,34,40,42,43,47,52], 8/25 medium scores [35,36,39,41,48,50,56,57] and 10/25 high scores [37,38,44–46,49,51,53–55]. In the group of multidimensional *nomothetic* instruments, 3/23 have low scores [66,76,79], 12/23 medium scores [58,60,62–64,67,69,70,74,75,78,80] and 8/23 high scores [59,61,65,68,71–73,77]. In the group of *idiographic* instruments, 3/11 have low scores [81,89,90], 6/11 medium scores [82–84,87,88,91] and 2/11 high scores [85,86].

Discussion

A rapidly increasing number of MiL instruments have been published per decade. Most instruments are *nomothetic*, approximately half of which are unidimensional, and the remainder are multidimensional. They assess the extent of experienced MiL, the lack thereof, sources of meaning, search for, making of, commitment to and structure of meaning. Some instruments specifically assess meaning in illness. The smaller group of *idiographic* instruments assesses aspects of MiL with greater individuality but usually entail more administrative and scoring burden.

Definitions provided by instrument authors afford the researcher a grasp of what MiL is and also indicate that MiL is a complex construct that is conceptualized in various ways. Therefore, it is particularly important

in MiL research to provide as clear a definition as possible for what is assessed. Although the multitude of identified aspects speak to the complexity of the MiL construct, it may also reflect a lack of consensus among researchers as to what constitutes the essential dimensions of the construct. However, several identified aspects correspond well with Reker's dimensional model of MiL [3]: *framework*, *concept* and *sources* reflect the cognitive component; *search* and *commitment* the motivational component; and *well-being* and *evaluation* reflect the affective component. Other aspects (*presence* and *crisis* of MiL) comprise a combination of these three components. Reker's remaining three dimensions, *sources*, *breadth* and *depth* of MiL, were also clearly identified within the reviewed instruments. Some instruments extended the concept of MiL to time-related (*change*, *temporal*) and *structural* aspects.

The majority of identified MiL instruments were developed in North America. Only one instrument has explicitly paid attention to cultural differences [58]. *Idiographic* instruments have the advantage that respondents provide data in their own words, yet culture sensitivity is still required when coding and interpreting such data.

Although only few instruments were identified five times or more, it is important to note that extent of use is only a meaningful indicator for instruments that have been published for several years.

Instruments vary widely in length (4–151 items) and scale structure. Although longer instruments may have higher reliabilities and conceptualize aspects of MiL more broadly, they also pose a larger burden on respondents. Although *idiographic* instruments generally entail higher administrative burden, no respective information was available. It would be helpful if authors would indicate the extent of this burden along with respondent burden for potential users of the instrument.

Nomothetic instruments can be judged to be objective by virtue of their standardization. For *idiographic* measures, objectivity is more challenging. Administrative objectivity was demonstrated for all measures by standardized instructions, scoring objectivity was ensured using coding schemes and to a lesser degree by provision of interrater-agreement information. Most instruments have demonstrated good internal consistency. However, retest reliabilities were only reported for about one third to half of the instruments in each group, with even fewer (10/59) providing satisfactory information. If MiL measures are used as outcome measures in clinical evaluation research, retest reliabilities need to be well established. We need to know more about the stability of various MiL aspects, as well as its amenability to change through intervention. Thus, evaluation of sensitivity to change/responsiveness [29,93] of MiL measures will be particularly important. Most authors of MiL instruments offer some information on distribution, but few provide cut-off scores or norms. Based on Frankl's notion of a lack of MiL as pathogenic [2], it makes sense to provide cut-off scores with regard to the extent of MiL required for a healthy life. However,

the appropriateness of devising norms for other aspects of the MiL construct (e.g. content, breadth, depth) is debatable.

Construct validity evidence was available for almost all instruments, whereas criterion validity was only demonstrated for about a quarter of them. Whereas some instruments have been used frequently and by various author groups, many have only been applied once or twice. This may be because of the fact that researchers are not aware of existing instruments that are appropriate for their research goals and thus tend to develop new instruments or recur to the use of ad hoc questions (single questions, not included in this review). On the other hand, it may be due to the availability of a variety of different instruments.

Several authors have developed instruments to assess MiL within an illness context [10,38,42,46,50,51,61,71,74,76,78,80,86]. While these afford the possibility of including specific questions on meaning found in the illness or directly ask for changes in MiL since diagnosis, the downside may include difficulties to use such instruments across different patient populations, illness stages and in non-patient comparison populations (e.g. caregivers). Apart from this concern, three early illness instruments have provided detailed and convincing information on test development [38,51,74], similar to three more recent instruments assessing the impact of cancer [61,80] and sense making in multiple sclerosis [71].

Taken together, many MiL instruments have been developed and evaluated thoroughly so that researchers can choose from a broad pool of valid and reliable MiL instruments. The quality appraisals regarding test development and psychometric properties and the total scores presented in the results tables can guide researchers in choosing an instrument. It is important to keep in mind, however, that this total score is based on a number of different instrument properties, the importance and relevance of which varies depending on the particular research context and goals. Thus, the selection of *the best or most appropriate* instrument depends on these factors, on the target population and on constraints on respondent and administrative burden. Several short instruments with good psychometric properties were introduced recently. They assess purpose [49], meaning-making [55], presence and search [77], spiritual meaning [45] and individual meaning [88]. These may be particularly useful to assess target constructs within the clinical research settings of psycho-oncology and palliative care, where constraints on respondent burden are particularly relevant.

Limitations

There are several limitations to this review. First, search of articles was restricted to a certain combination of search terms and to English publications in peer-reviewed journals. Thus, information in dissertations, book chapters, manuals and other grey literature was not included. Second, we needed to restrict our review

to instruments clearly assessing MiL and excluded instruments assessing related constructs (e.g. spirituality, goals, values). Third, to make the project feasible, the presented information was mainly restricted to the primary publication. A detailed evaluation of the extent and quality of accumulated validity evidence for each measure was beyond the scope of this review. Similarly, relationships between MiL and other variables were not reported. Fourth, this review does not provide a detailed analysis and integration of theories in MiL research. Park provided an integrative review of the meaning-making literature, where she draws an important distinction between *meaning-making* (process) and *meanings-made* (outcome) [96].

Suggestions for further research

While some progress has been made in MiL research, some important tasks remain. One major area for further research is to bring together various concept analyses of MiL with related constructs like spirituality, values, goals, dignity, hope and self-actualization. The clear delineation of these concepts will help researchers integrate their findings within existing research. A related domain of interest pertains to the relationships between the various aspects of MiL (e.g. search and crisis). Further clarification of the conceptual boundaries and internal structure of MiL, based on strong theories and matching empirical evidence, will also contribute to a better understanding of appropriate variables for criterion and construct validity evaluation. In-depth analyses of the validity evidence of selected subgroups of instruments [see e.g. 27,28] would help to further assist researchers in choosing appropriate instruments for specific research questions. Routine inclusion of information on retest reliability and stability, responsiveness and administrative and scoring burden is desirable. We recommend that authors provide full instrument information (instructions, all items, scaling) so that researchers can readily assess its suitability for their research needs. Finally, more cross-cultural research would be beneficial to strengthen the theory and research base of MiL.

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Conflict of interest

There is no potential conflict of interest.

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