



ABSTRACT

We conducted a systematic review of the published literature relating to the assessment and measurement of wellness in order to answer the following questions: 1) What is the working definition of wellness? 2) What wellness assessment instruments have been evaluated or applied in medical settings? 3) How valid, reliable, and accessible are these wellness assessment tools? The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed for this systematic review. Studies published from 1990 to 2016 on wellness assessment were identified through Medline and PsycINFO using the following keywords: “assessment” OR “evaluation” OR “measurement” AND “wellness” OR “wellbeing.” Two authors independently conducted a focused analysis then reached a consensus on 23 studies that met the specific selection criteria. This review revealed that there is a lack of uniform definition of wellness. The studies utilizing wellness assessment tools demonstrate strongest reliability values for the following instruments: Wellness Evaluation of Lifestyle, Five-factor Wellness Evaluation of Lifestyle, Perceived Wellness Survey, the Optimal Living Profile, and the Body-Mind-Spirit Wellness Behavior and Characteristic Inventory. However, there is insufficient evidence to support the clinical utility of a single particular wellness instrument. Properly defining wellness might help drive the development and validation of more precise assessment and measurement methods. This could reinforce interventions that promote wellness.

Keywords: Assessment, evaluation, measurement, wellness, wellbeing, instruments

The Assessment and Measurement of Wellness in the Clinical Medical Setting: A Systematic Review

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Most people are interested in achieving optimal health; however, the medical field has been criticized for disproportionately focusing on the elimination of disease rather than the promotion of health in recent years.¹ Over the last decade, healthcare professionals have begun to shift their approach to be more aligned with patient preferences by routinely guiding people to healthier lifestyle choices by improving wellness.² Currently, two concepts have persisted: the emphasis on the multidimensional nature of wellness and the categorization of self-perceived wellness into at least three broad dimensions—the physical, mental, and social.³

In 1964, The World Health Organization (WHO) defined health as a state of physical, mental, and social well-being, not merely the absence of disease.⁴ Since its conception, the definition of wellness has continued to change.³ However, to better understand wellness, it is crucial to first understand what it is not.

First, wellness is different than health. Whereas the term *health* focuses on illness

status and the individual's relationship to that status, wellness transcends the absence of disease.⁵ Furthermore, wellness is different from wellbeing. Wellbeing can be described as the balance-point between an individual's resources and the challenges he or she faces.³ Although wellbeing is a step toward wellness, it is not necessarily as encompassing as wellness. It is possible for someone to be in a state of wellbeing but not wellness; depletion of adequate resources (psychological, social, and/or physical) can prevent one from attaining wellness.³ Additionally, wellness should not be confused with quality of life (QOL), which involves an individual's subjective perspective of his or her health and function in physical, psychological, social, and cognitive domains.⁶ QOL is a measure of a patient's subjective evaluation of health and life aspects despite a given diagnosis, whereas according to the WHO, wellness involves more than the absence of disease, implying that absence of disease is one of the requirements for wellness. With these definitions in mind, we can understand wellness as an

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evolving process toward achieving one's full potential; it is positive/affirming and holistic, and encompasses lifestyle, spiritual, and environment wellbeing domains. Wellness also accounts for the physical, mental, and social domains implied in health, and thus health is dependent on sufficient wellness.⁷ By better understanding wellness, physicians and patients can work together better to best treat the needs of the patient.

The importance of comprehensive wellness assessment in regular clinical practice cannot be overemphasized.⁸ The use of standardized wellness measurement instruments in primary care settings could improve preventive services, behavioral health outcomes, and overall patient care. Additionally, it allows for longitudinal tracking of overall patient health and extrapolation of long-term health outcomes.⁹

This systematic review of the published literature relating to the assessment and measurement of wellness was performed to identify areas where future studies are needed to move the field forward by addressing the following questions: 1) What is the working definition of wellness? 2) What wellness assessment instruments have been evaluated or applied in medical settings? 3) How valid, reliable, and accessible are these wellness assessment tools?

METHODS

Search strategy. We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for this review.¹⁰ A systematic literature search was conducted on articles listed in the PubMed and PsycINFO databases from January 1990 to February 2016 after setting exclusion and inclusion criteria. The keywords used for the search were *assessment* OR *evaluation* OR *measurement* AND *wellness* OR *wellbeing*. We also conducted a manual search of reference lists of identified papers and previous reviews of wellness assessment.

Study selection criteria and methodology. The following inclusion criteria were used: 1) articles that were in English or had an available published English translation; 2) articles that were previously published in a peer-reviewed journal; 3) studies of any design that focused on the assessment of wellness; and 4) studies that used at least one wellness

assessment measure. Exclusion criteria included editorials, opinion pieces, and case reports. Two authors independently conducted a focused analysis then reached a consensus on studies that met the specific selection criteria.

Data extraction and yield. Key findings were derived from the full text and tables of the selected studies. Study design and findings were analyzed for quality and detailed in Tables 1 and 2.

RESULTS

Our search strategy identified 3,654 relevant articles. After reviewing the abstracts of 3,654 studies, irrelevant studies were excluded, leaving 51 studies. Two authors independently conducted a focused analysis using the gathered 51 full-text articles. The two authors then reached a consensus on the studies to include in this review, which yielded 23 studies. The findings from the reviewed studies are displayed in Table 1.

1. What is the working definition of wellness? The WHO's original definition of health provided the foundation for defining *wellness* by emphasizing the three dimensions wellness comprises: physical, mental, and social health.¹¹ These dimensions highlight that wellness not only comprises individual aspects but is an integrated whole.¹² Wellness results from a balance of the dimensions, allowing an individual to cope with life circumstances and to achieve an optimal state of being.¹³ Thus, an operational definition of wellness emphasizes lifestyle behaviors that go beyond basic health into optimal states across multiple dimensions.¹⁴

In 1998, the Wheel of Wellness (WoW), a theoretical framework to better understand the concept of wellness, was developed.¹⁵ This widely used framework defined wellness as a "way of life oriented towards optimal health and well-being in which mind, body, and spirit are integrated by the individual to live life more fully within the human and natural community."¹⁶ In 2004, the WHO Health Promotion Unit in Geneva, Switzerland, updated the definition of wellness in the Health Promotion Glossary as, "the optimal state of health of individuals and groups. There are two focal concerns: the realization of the fullest potential of an individual physically, psychologically, socially, spiritually, and economically, and the fulfillment of one's

role expectations in the family, community, place of worship, workplace, and other settings."¹⁷ To properly assess wellness, comprehensive measurement methods that accurately identify and evaluate these various dimensions are necessary. However, the layered multidimensionality that is intrinsic to the concept of wellness has created roadblocks in developing a gold standard definition and has contributed to the disparities in evaluating wellness.³ Others assert that wellness is often considered the endpoint of physical, mental, or social interventions.

2. What are the current wellness assessment instruments that can be applied in a clinical medical setting? *Wellness assessment instruments.*

Data collected about wellness assessment instruments can be found in Table 2.

Lifestyle Assessment Questionnaire (LAQ). One of earliest wellness assessments created for clinical use was the LAQ, also known as the TestWell Wellness Inventory.¹⁸ Established by the National Wellness Institute in 1983, the LAQ is a 100-item questionnaire assessing 10 wellness domains on a five-point Likert scale. The 10 domains include physical fitness, physical–nutritional, physical–self-care, drugs and driving, social–environment, emotional awareness, emotional control, intellectual, occupational, and spiritual. The LAQ was used in four of the reviewed studies to assess wellness in college undergraduates, in college freshmen, and in wellness professionals.^{18–21}

Wellness Inventory (WI). The second tool from the 1980s was the WI,¹⁹ which contains 120 questions examining 12 domains: self-responsibility and love, breathing, sensing, eating, moving, feeling, thinking, playing and working, communicating, sex, finding meaning, and transcending. The WI was used in three of the reviewed studies to assess wellness in undergraduate students and in wellness professionals.^{19–22}

Life Coping Inventory (LCI). The third tool from the 1980s was the LCI,²¹ which examines coping-related behaviors with 142 questions that assess seven distinct dimensions: coping style actions, nutritional actions, physical care actions, cognitive and emotional actions, low-risk actions, environmental actions, social support actions. The LCI was used in one of the reviewed studies to assess wellness in undergraduate students.²¹

Wellness Evaluation of Lifestyle (WEL).

Developed from the theoretical framework of the WoW model, the WEL assessment tool was created in 2000.¹⁶ The WEL is a comprehensive tool for assessing wellness and prevention over an individual's lifespan.^{2,15} The WEL comprises five second-order and 17 third-order dimensions, which are all integrated into wellness: a single higher-order factor. The second order dimensions include 1) creative self (problem-solving and creativity, feelings of control, sense of humor, work, and emotional awareness); 2) coping self (realistic beliefs, leisure, stress management, and sense of worth); 3) social self (friendship and love); 4) essential self (spirituality, self-care, gender identity, and cultural identity); and 5) physical self (exercise and nutrition). The WEL has been reported to recognize each dimension of the WoW model and has even been called the gold standard of wellness assessments.^{2,23}

Five-factor WEL (5F-Wel) and Four-factor WEL (4F-Wel). The thorough WEL analysis led to the development of an updated WEL: the 5F-Wel,²⁴ which has demonstrated significantly improved validity and reliability compared to the WEL.²⁴ The 5F-Wel was further pared into a newer and shorter instrument: the 4F-Wel.²⁵ The 4F-Wel provides reliable scores for four distinct aspects of wellness: 1) cognitive-emotional, 2) relational, 3) physical, and 4) spiritual. The 4F-Wel emerged after the 5F-Wel statistically failed to demonstrate consistent relationships between the 17 scales reported in the WEL. Additionally, the 4F-Wel is the shortest assessment instrument for explaining a given wellness dimension (the WEL and 5F-Wel are both lengthy with 123 items and 91 items, respectively).^{3,24} The WEL was used in seven of the reviewed studies to assess wellness in Korean-American adolescents, in undergraduate students, in military cadets, in midlife women, and in adolescents of age 12 to 15.^{23,25–28}

Perceived Wellness Survey (PWS). The PWS assessment tool evaluates overall wellness.²⁹ The dynamic and bi-directional PWS is founded upon three core aspects that are shared across all models of wellness. These three core aspects are 1) multidimensionality, 2) balance among dimensions, and 3) measures of wellness in six dimensions.³⁰ However, the PWS measures perceived health, not wellness. While it is not the best

at detecting health-risk behaviors common among college students, such as alcohol/drug use, safety factors, or sexual behaviors, its focus on health perceptions makes it a unique tool.¹⁹ The PWS was used in three of the reviewed studies to assess wellness in military cadets and in undergraduate students.^{28–30}

The Optimal Living Profile (OLP). Although wellness assessments could be valuable in clinical settings to help healthcare professionals understand their patients, many tools were developed specifically for scientific studies on wellness. The OLP was used in two studies to evaluate wellness.³¹ This assessment tool focuses on self-discovery, preventive care, and healthy lifestyle habits and includes measurements that evaluate the dimensions of intellectual, emotional, social, spiritual, physical, and environmental health.² The OLP was used in two reviewed studies to assess wellness in military cadets.^{28,31}

Web-based health risk assessment (HRA) tool. Two different studies used the HRA tool, which assessed wellness via behaviors contributing to health problems, such as smoking and drug and alcohol use. The HRA tool was used in two of the reviewed studies to assess wellness among insurance company employees and in patients of a community primary care practice.^{9,31}

The Body-Mind-Spirit Wellness Behavior and Characteristic Inventory (BMS-WBCI). The BMS-WBCI was developed in a two-study project conducted in 2006 as a wellness evaluation instrument for college students.^{19,32} This inventory measures 1) physical, 2) emotional, 3) intellectual, 4) occupational, 5) social, and 6) spiritual dimensions and has been shown to be a consistent measure of wellness.^{19,32} The BMS-WBCI was used in two of the reviewed studies to assess wellness in college undergraduate students.^{19,32}

The Satisfaction with Life Survey (SWLS) and the Wellness Behavior Survey (WBS). The SWLS and WBS were utilized to evaluate wellness in first-year family medicine residents.³³ The SWLS has five items to evaluate an individual's satisfaction with his or her life, while the WBS has 14 items evaluating 1) diet/nutrition, 2) physical activity/exercise, 3) mind-body activities, 4) nurturing relationships, 5) sleep, 6) prayer, 7) being outdoors in nature, 8) tobacco and alcohol use, and 9) prescription medication for mood or sleep. The study also

included scales for stress, depression, and burnout for the individual's overall evaluation of wellness. The SWLS was used in two of the reviewed studies to assess wellness in first-year family medicine residents and in midlife women.^{25,33} The WBS emphasizes lifestyle behaviors that promote optimal states of being across multiple dimensions. The WBS was used in one reviewed study to assess wellness in first-year family medicine residents.³³ In a study of older adults living in a community dwelling, wellness was evaluated using a variety of self-report tools focusing on the individual's ability to carry out activities of daily living (ADLs).³⁴

Ryff's Psychological Well-being (PWB) scales. PWB scales measure six dimensions of wellness: 1) autonomy, 2) environmental mastery, 3) personal growth, 4) positive relations with others, 5) purpose in life, and 6) self-acceptance. Data, not theory, suggested a possible five-factor model, which would combine indicators of self-acceptance and environmental mastery because they were highly correlated. Initially, each dimension was operationalized with a 20-item scale to be 120 items in total but there are two shorter versions, an 18-item version (each dimension is 3 items) and a 42-item version (each dimension is 7 items). The response scale was a six-point continuum, ranging from "completely disagree" to "completely agree."³⁵ PWB scales were used in one of the reviewed study to assess wellness in noninstitutionalized English-speaking adults aged 25 years or older.³⁵

Medical setting application. The following instruments have been implemented in medical settings: WEL, 5F-Wel, PWS, OLP, and the BMS-WBCI. However, when instruments measure multiple dimensions of wellness, completion of the instruments is time-consuming for the participants and administrators. The WEL and the 5F-Wel have 123 and 91 items, respectively. The WEL scoring ranges from 20 to 100, while the 5F-WEL ranges from 25 to 100, with higher scores indicating greater wellness.²⁴ It would not be time efficient to administer these tests in a clinical medical setting because they take over two hours to complete. However, the 4F-Wel has only 56 items and still accurately measures the core WoW dimensions. The 4F-Wel provides a promising potential for

clinical medical use, but our reviewers were unable to find a publicly available copy of the 4F-Wel. Although the 4F-Wel is a more time-efficient assessment tool, the lack of public availability creates an obstacle to its widespread implementation in medical settings. The developers of this assessment tool also asserted that more research is needed to validate the instrument further.

Both the OLP and PWS were consistent with previous wellness studies in an outpatient setting.² Because of its brevity (36 items) and accessibility (free online), the PWS has excellent utility in a clinical medical setting, takes less than 30 minutes to administer, and is well-researched and supported. The PWS scores range from three to 29, with higher scores indicating greater perceived wellness. While the OLP takes 15 to 20 minutes to complete electronically, it was designed for a particular organization (Canyon Ranch) and has less literature supporting its use.²⁸ However, its developers assert that the OLP is readily comprehensible and presents an accessible self-report format that makes it convenient for use in primary care settings.³¹ After careful component analysis, both the OLP and the PWS appear suitable for measuring wellness in Cadet soldiers.²

The BMS-WBCI has 44 items, with scores ranging from 44 to 132. Scores below 74 indicate the need for immediate change in behavior, scores above 103 indicate that a wellness lifestyle exists, and scores from 74 to 103 indicate that behavior change is needed in certain areas. The BMS-WBCI is short and easy to administer, and it focuses on assessing the frequency of positive health behaviors, making it a useful assessment tool to identify health-risk behaviors and create improvement goals.⁹

3. How valid, reliable, and accessible, are these wellness assessment instruments? Validity and reliability.

The WEL is one of the oldest and most validated wellness assessment tools to date and is considered the gold standard of evidence-based wellness measurement.^{2,36} The WEL measures the 17 domains found in the framework of the WoW through 123 questions, all of which have reliability with internal consistency (alpha scores ranging from 0.61–0.89 across all domains).²⁶ The WEL is not readily accessible because its developers require a \$15 charge for its use.

The 5F-Wel is an updated version of the WEL.¹⁶ There is still the required fee of \$15 for its use, the 5F-Wel has only 91 questions and has been found to be valid and reliable. 5F-Wel has since been revised to the 4F-Wel, providing useful and reliable (RMSEA=0.10 and NNFI=0.89) measure of wellness with only 56 items; however, it does not appear to be available to the public.

The LAQ, also known as TestWell, was more widely used in the 1990s and measures wellness across multiple dimensions.⁹ It is cumbersome to complete, as it has 100 items, and includes a charge for the assessment, which ranges from \$0.23–1.20 per instrument per year to administer. Additionally, Hunter & Leeder found minimal support for the external validity of particular LAQ scales as precise measurements of wellness, especially those of the physical dimension.⁸ Related to the same time era of LAQ are the WI and the LCI. Both the WI and LCI have demonstrated strong internal consistency and content validity upon analysis, as did the LAQ (Cronbach's coefficient $\alpha=0.93$ and $\alpha=0.84$, respectively).^{20,21} After careful review of the literature, neither of these instruments appear to be regularly used today.

The PWS was evaluated for internal validity and was consistent with previous wellness studies in an outpatient setting.² The PWS offers a reliable and valid assessment instrument of 36 items while maintaining stringent criteria. The PWS has free online access. The construct validity of the PWS is strongly supported.³⁰

The OLP consists of 131 electronic items and is free of charge.² Four of the six scales had test-retest stability above $r=0.820$. The OLP was evaluated for internal validity and was found to be consistent with previous wellness studies in an outpatient setting.² However, Hunter & Leeder reported that the OLP had poor reliability and validity measures, indicating that more research is needed to validate the use of OLP.⁸

The BMS-WBCI is a relatively new 44-item assessment that consists of three subscales focused on evaluating wellness in the college student population. In the first study focusing on the development of the BMS-WBCI, the following alpha scores measured: mind ($\alpha=0.88$), body ($\alpha=0.81$), and spirit ($\alpha=0.91$).⁹ In the same article, Hey et al⁹

conducted a second study and found the following alpha values: mind ($\alpha=0.75$), body ($\alpha=0.87$), and spirit ($\alpha=0.92$). Data obtained from the BMS-WBCI provided a normal distribution (standard curve within 3 SD and $p<.05$) and strong internal consistency ($\alpha=0.91$).³² The researchers supported the use of this instrument for among college populations.

The Ryff's PWB scale has many versions (e.g., 120-item scale, 42-item scale, and 18-item scale). The 120-item scale has shown high internal consistency and test-retest reliability, while the 18-item scale estimates of consistency have been measured at low to modest. This modest internal consistency likely reflects the small number of indicators per scale. Therefore, the 42-item scale shows more internal consistency than the 18-item scale but still less than the original one (120-item scale). Regarding validity, for the 120-item scale, it shows convergent and discriminant validity with other measures. In the 18-item scale, all 18 items continue to meet psychometric criteria. Comparison of the theory-based indicators of well-being (Ryff's PWB scales) with other frequently used measures indicate moderate to strong associations between two scales (self-acceptance and environmental mastery) and single- and multi-item scales of happiness, life satisfaction, and depression. Moreover, the remaining four dimensions of well-being (positive relations with others, purpose in life, personal growth, and autonomy) showed mixed or weak relationships with these prior indicators.¹⁸

No data were found within our search parameters for the validity and reliability of the SWLS, WBS, or the HRA tool.

Accessibility/implementation. A successful wellness intervention hinges upon effective measurement of wellness before and after the intervention. Such programs have the goal of empowering others toward self-care and personal control over health and wellness.

One study found that a hospital-based wellness clinic is feasible, well-used, and perceived by most to have positive health benefits.³⁷ These health benefits include decreased work stress, improved mood/sleep, and an overall improved lifestyle. After visiting the hospital-based wellness clinic, 97 percent of participants ($n=2,756$) reported

that they would advise a friend or coworker to visit the clinic for consultation and treatment. Such programs could significantly improve health status and cause a shift toward a state of wellness.⁹ Another study found that employees who participated in an organizational wellness program showed less job absenteeism and greater job satisfaction.³⁸ Wellness intervention programs also benefit the economics of the organization.³¹ Another study demonstrated that a comprehensive health promotion program (Highmark Wellness) significantly lowered healthcare costs and produced a positive return on investment (ROI) (\$1.65 for every dollar spent on the program).¹⁸ Wellness program participants averaged annual savings of \$181.78 per person, in comparison to nonparticipants ($p < .0001$). These examples provide emerging evidence in support of the feasibility of wellness instruments and wellness program interventions in the health care and organizational setting.^{18,27,39–44}

DISCUSSION

The reviewed studies of wellness assessment tools demonstrate strong reliability values for the following instruments: WEL, 5F-Wel, PWS, OLP, and the BMS-WBCI. However, the evidence is insufficient to assert a specific instrument's use in clinical practice. As effective as wellness interventions might seem, without effectual assessment tools to measure wellness, clinicians and researchers are left to deduce effects of treatment from secondary measurements and subjective appraisal. The use of an accurate wellness tool would likely assist clinicians in better understanding which treatment approach would achieve the greatest health benefits for each individual patient. Additionally, the proprietary nature of many of these assessments could be a significant barrier to regular use and presents another limitation to feasibility and implementation.

This review revealed that descriptions of wellness vary, and the term lacks a singular definition. It is important to establish a clear definition to minimize variability when assessing for wellness. It is essential for this working definition to include specific dimensions that can be measured in the clinical setting. Among the wellness

definitions, the WHO's 2004 definition conceptualizes wellness best as the optimal state of health for individuals and groups, not merely the absence of disease or infirmity, with two focal concerns: 1) the realization of the fullest potential of an individual physically, psychologically, socially, spiritually, and economically and 2) the fulfillment of each individual's role expectations in the family, community, place of worship, workplace, and other settings.

Limitations. By limiting this review to English papers and assessments, our review might have limited applicability in international and/or non-English speaking cultures. Furthermore, the data available on wellness assessments are relatively lacking, with the notable absence of well-controlled, longitudinal wellness research studies. Finally, because the definitions underpinning wellness assessments are in constant flux, the accuracy of these assessments can shift as the definition of wellness evolves.

CONCLUSION

Through a systematic review of published literature, we sought to explore wellness definitions, the clinical utilization of varied wellness assessment instruments, and the validity, reliability, and accessibility of these instruments in the assessment of wellness. Our review reveals the need among the medical community to develop a consensus on defining wellness to complement emphasis on treating and preventing disease with health promotion. Such a consensus could, in turn, drive the development and validation of more precise wellness assessment and measurement methods. Although wellness can be assessed using the currently available tools, as described in this article, there is room for improvement and for creation of a more accurate, shorter, and more encompassing assessment. The current assessments are based only on our current definition of wellness, so longitudinal studies tracking the different aspects of wellness and their implications over time are necessary. We hope that this review encourages more research on wellness assessment tools and assists clinicians and researchers in accessing to the wellness assessments tools most suitable for their needs and the needs of their patients.

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Tables 1 and 2 are located on pages 20–23

TABLE 1. Characteristics of the reviewed wellness studies

STUDY (YEAR)	STUDY DESIGN	MEASURES	POPULATION	MAIN FINDINGS
T. Adams et al (1997) ²⁹	Cross-sectional	LAP, LOT, SC scale, PWS	N=112, undergraduate students (107 completed the study)	LAP measures spiritual wellness, LOT and SC scale measure psychological wellness, and PWS measures overall wellness. Optimistic outlook ($r=0.55, p<0.05$) and sense of coherence ($r=0.60, p<0.05$) was demonstrated to directly impact overall wellness.
Degges-White (2006) ²⁵	Cross-sectional	WMTS, 5F-Wel, SWLS	N=224, midlife women	There is lack of a significant relationship between timeliness and expectedness of transitions and life satisfaction and wellness ($p=0.051$) with this scale. This suggests that life satisfaction and wellness might not be negatively affected by midlife transitions. Mitigating factors, such as financial, support network, and life experience, could contribute to these findings. Household income did significantly contribute to differences in wellness and life satisfaction ($p=0.001$).
Schafer (2012) ²⁸	Cross-sectional	OLP, PWS, WEL	N=768, military cadets	OLP and PWS were evaluated for internal validity, both of which were consistent with previous wellness studies in an outpatient setting. Both provided reliable and valid measurement with stringent criteria (PWS Internal Consistency for Emotional Reliability: $\alpha=0.78$; Intellectual Reliability: $\alpha=0.66$; Physical Reliability: $\alpha=0.69$; Social Reliability: $\alpha=0.87$; Spiritual Reliability: $\alpha=0.73$); (OLP Internal Consistency for Emotional Reliability: $\alpha=0.81$; Intellectual Reliability: $\alpha=0.72$; Physical Reliability: $\alpha=0.70$; Social Reliability: $\alpha=0.92$; Spiritual Reliability: $\alpha=0.75$). OLP and PWS were differentiated by theoretical basis, naming of wellness variables, number of questions, and scoring. Both the OLP and PWS appear suitable for measuring wellness in cadet soldiers.
Brissette et al (2013) ⁴⁰	Cross-sectional	WellSAT	N=23, public health practitioners	Study results support that WellSAT is a practical and valid tool for health and school agencies to collect wellness program information in a standard format. Correlation between independent rater assessment of strength ($r=0.88$) and comprehensiveness ($r=0.77$) of programs was strong.
Hattie et al (2004) ²⁶	Cross-sectional	103-item WEL	N=3,043	The reliability estimates of this WEL version, when correlated with related instruments, were high enough to meaningfully interpret their scores ($p<0.01$). This suggests usefulness of WEL score assessment. Factor analysis of WEL confirmed original 17 dimensions (third order) and 5 high-order dimension (second order: creative self, coping self, social self, essential self, and physical self). It defined wellness (first order) as "way of life oriented towards optimal health and well-being in which mind, body, and spirit are integrated by the individual to live life more fully within the human and natural community." Clinically, the WEL is practical and comprehensive. It has reported internal consistency reliability scores ($\alpha=0.61-0.89$).
Nagykaldi et al (2013) ⁹	Longitudinal	HRA tool (web-based)	N=200	This comprehensive web-based health risk appraisal tool can improve preventive services, patient care, behavioral health outcomes, and wellness indicators in primary care settings. Wellness score improved from 67.6 to 69.9 in an intervention group ($p=0.03$) compared with no change in the control group.
Hermon and Hazler (1999) ²³	Cross-sectional	WEL, MUNSH	N=155, undergraduate students	WEL gave more equal assessment recognition to each dimension of the wellness model. Findings show adherence to holistic wellness model. Wellness goes beyond physiology. Psychological constructs might hold equal or greater significance to our understanding of the wellness of the whole person. Predictor variables on quality of life and component of psychological well-being demonstrated a significant relationship ($p<0.001$).
Thompson et al (2011) ³⁴	Longitudinal	Katz instrument of ADLs, Lawton IADLs, CDC QOL self-report, vital signs, N-CPC, MSPSS, SPS	N=27, aged 78-94 years	This scale measured wellness in older adults residing in community-dwelling, and examined functional/physiological, cognitive/mental, social and spiritual domains. Parameters were highly correlated across multiple domains of wellness. Clusters were noted, especially across cognitive and physiological domains. Increased number of chronic diseases were negatively correlated with planning ($p=0.016$). Evidences need for integrated approach to assessment of wellness.
(Renger, 2000) ¹³	Cross-sectional	OLP	N=102	The theoretical framework and validity of OLP were examined. OLP was administered before (test) and after (retest) LEP. Four of 6 scales had test-retest stability above $r=0.8$.
(Chang, 2003) ⁴⁵	Cross-sectional	WEL	N=6, Korean American adolescents	Only 4 of 19 subscales of WEL had large effect size (d value >0.8) between the English and Korean version. There is a need for adaptation of personality measures across cultures. Adaptations could uncover important differences in underlying factors that contribute to wellness between different cultures.
(Rachele et al, 2014) ²⁷	Cross-sectional	5F-Wel, IPAQ-A	N=493, 12-15 years old	Demonstrated a significant relationship between self-reported physical activity and various elements of wellness. Friendship ($p=.001$), self-worth ($p=.002$), gender identity ($p=.026$), love ($p=.022$), self-care ($p=.001$), spirituality ($p=.014$), cultural identity ($p=.0333$), and exercise ($p=.001$) were all associated with meeting the physical activity guidelines. If causal links of these relationships are determined, this will establish implications for physical activity promotion interventions.
Duncan et al (2011) ³⁷	Cross-sectional	Survey evaluating overall experience and impact	2,756 surveys; 1 survey per wellness clinic visit	Evidence suggests a hospital-based wellness clinic based on complementary and alternative medicine (CAM) is feasible, well-used, and perceived by most to have positive health benefits related to decreased work stress, improved mood/sleep, and improved lifestyle. Overall, 97% of participants reported they would recommend the wellness clinic to a friend or co-worker.
Parks & Steelman (2008) ³⁸	Meta-analysis	4 databases: Info Trac, ProQuest, PsycINFO, and Dissertation Abstracts International; reference sections of retrieved studies; organizational publications and websites	17 of 200 studies that met inclusion criteria and were analyzed	Participation in organizational wellness program was associated with lower absenteeism ($Q=16.94, p<0.05$) and higher job satisfaction ($Q=16.52, p<0.01$). There is evidence to support continued use of wellness programs in organizations.

TABLE 1, CONT. Characteristics of the reviewed wellness studies

STUDY (YEAR)	STUDY DESIGN	MEASURES	POPULATION	MAIN FINDINGS
Adams et al (1998) ³⁰	Cross-sectional	PWS	N=1,077	In all but 3 of the analyses, the highest and lowest perceived wellness groups were significantly different ($p<.05$); therefore, construct validity of PWS was strongly supported. PWS fills a void in perceived health research and demonstrates utility as research tool.
Myers et al (2004) ⁴¹	Longitudinal	5F-Wel, WEL	N=3,993	5F-Wel was revised to provide useful and reliable (RMSEA=0.10 and NNFI=0.89) measure of wellness with only 56 items. This new measure, called 4F-Wel, can provide reliable scores for 4 distinct aspects of wellness: cognitive-emotional, relational, physical, and spiritual. This scale still needs more comparison to 5F-Wel.
Lebensohn et al (2013) ³³	Cross-sectional	PSS, CES-D, MBI, SWLS, Wellness behavior survey	N=168, first-year family medicine residents	This scale evaluated the well-being of FM residents, looking at measures of various dimensions of wellness. Restful sleep was significant predictor in all 5 models for well-being measures ($p<.001$). Physical activity was associated with more positive well-being in 4 of the 5 well-being measures ($p<.05$).
Naydeck et al (2008) ³¹	Longitudinal	HRA administered by Highmark Wellness Program, Highmark Wellness Program intervention	N=9,666	A study suggests a comprehensive health promotion program (Highmark Wellness Program) can lower healthcare costs and produce a positive ROI (\$1.65 for every dollar spent on the program). The most significant difference was between participants and nonparticipants for inpatient expenditures, which averaged \$181.78 savings per person per year ($p<0.0001$).
Mareno, 2010) ³²	Cross-sectional	BMS-WBCI	N=106, undergraduate students	The BMS-WBCI has 44 items and 3 subscales that measure physical, emotional, intellectual, occupational, social, and spiritual wellness dimensions. The data provided normal distribution (normal curve within 3 SD and $p<0.05$) and strong internal consistency ($\alpha=0.91$). Researchers support the use of this instrument among the college population.
DeStefano and Richardson (1992) ¹⁸	Cross-sectional	LAQ	N=214, incoming college freshman	This scale has little support for external validity of specific LAQ scales as specific indicators of current health. LAQ scales are related more highly to individuals' perceptions of their general physical and mental health than with the objective indicators ($p<0.01$). Most LAQ scales are correlated more highly with perceptions of one's own mental health than with perceptions of one's own physical health ($p<0.01$). Objective/perception differences are mainly among high/higher levels of health vs. healthy/unhealthy responses.
Hey et al (2006) ¹⁹	Cross-sectional	BMS-WBCI, TestWell, Wellness Inventory, NIH EATS, Self-report physical activity question	N=141, college undergraduates	The BMS-WBCI was developed in Study 1 to measure wellness in a college population. This population had distinct risk factors. In Study 2, the reliability and validity of BMS-WBCI was further evaluated. The split-half reliability and alpha coefficients were fair to excellent for each dimension ($\alpha=0.75$ (Mind), 0.87 (Body), 0.92 (Spirit)). It has high internal consistencies (range, $\alpha=0.81-0.91$). Additionally, the between-scale correlations ranged from $r=0.277-0.526$. These results demonstrate that the BMS-WBCI is a valid and reliable assessment of wellness for college students.
Jones & Frazier (1994) ²⁰	Cross-sectional	TestWell, Wellness Inventory	N=90, wellness professionals	The TestWell Wellness Inventory has 100 questions and is scored on a 5-point Lickert scale. It has 10 subscales: physical fitness, nutrition, self-care and safety, emotional wellness, social awareness, emotional awareness and sexuality, emotional management, intellectual wellness, occupational wellness, and spirituality and values. A study demonstrated reliability coefficients Cronbach's α of 0.84 among wellness professionals assessed with TestWell.
Palombi (1992) ²¹	Cross-sectional	WI, LAQ, LCI	N=114, full-time undergraduate students aged 18-50 years old	This scale has strong internal consistency (Cronbach's coefficient $\alpha=0.93$). Coefficient $\alpha>0.74$ was obtained on 8 of 12 subscale scores (eating, moving, feeling, thinking, playing and working, communicating, finding meaning, and transcending). It has strong internal consistency of LAQ ($\alpha=0.93$). Cronbach's coefficient was $\alpha>0.74$ on 8 of 10 subscale scores (nutrition, drugs and driving, emotional awareness, emotional control, intellectual, occupational, social, and spiritual). It has strong internal consistency of LCI (Cronbach's coefficient $\alpha=0.93$). Cronbach's coefficient was $\alpha>0.74$ on most of the 7 subscale scores (nutrition, physical care, cognitive and emotional actions, environmental actions, coping style, and social support).
Ryff and Keyes (1995) ³⁵	Cross-sectional	Ryff's psychological well-being scales	N=1,108, non-institutionalized, English-speaking adults, aged 25 years or older	The scale measures 6 dimensions of wellness: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. Each dimension was operationalized to be 20 items, which is 120 items in total. The response scale was a 6-point continuum, ranging from completely disagree to completely agree. Concerning the 120-item scale, it shows convergent and discriminant validity with other measures. In the 18-item scale, the 18 items continue to meet psychometric criteria, with each item correlating strongly and positively with only its own scale. Comparison of the theory-based indicators of well-being with other frequently used measures indicated moderate-to-strong associations between 2 scales (Self-Acceptance and Environmental Mastery) and single- and multi-item scales of happiness, life satisfaction, and depression. However, the remaining 4 dimensions of well-being (Positive Relations With Others, Purpose in Life, Personal Growth, Autonomy) showed mixed or weak relationships with these prior indicators.

5F-Wel: Five Factor Wellness Inventory; ADLs: activities of daily living; BMS-WBCI: Body-Mind-Spirit Wellness Behavior and Characteristic Inventory; CDC: Center for Disease Control; CES-D: Center for Epidemiologic Studies—Depression Scale; HRA: Health Risk Assessment; IADLs: instrumental activities of daily living; IAPQ-A: International Physical Activity Questionnaire for Adolescents; LAP: Life Attitude Profile; LAQ: Lifestyle Assessment Questionnaire; LCI: Lifestyle Coping Inventory; LEP: Life Enhancement Program; LOT: Life Orientation Test; MBI: Maslach Burnout Inventory; MUNSH: Memorial University of Newfoundland Scale of Happiness; MSPSS: Multidimensional Scale of Perceived Social Support; N-CPC: Neuropsychological—CogniFit Personal Coach; NIH EATS: National Institute of Eating at America's Table Study; NNFI: non-normed fit index; OLP: Optimal Living Profile; PSS: Perceived Stress Scale; PWS: Perceived Wellness Survey; QOL: Quality of Life; RMSEA: root-mean-square error; SC: Sense of Coherence; SPS: Spiritual Perspective Scale; SWLS: Satisfaction With Life Survey; WEL: Wellness Evaluation of Lifestyle; WellsAT: Wellness School Assessment Tool; WI: Wellnes Inventory; WMTS: Women's Midlife Transition Survey

SYSTEMATIC REVIEW

TABLE 2. Wellness assessment instruments

NAME	ITEMS	DETAILS	TIME	ACCESSIBILITY	RELIABILITY	VALIDITY	NOTES
LAQ)/ TestWell	100	Assesses 10 wellness domains on a 5-point Likert scale: 1) physical fitness; 2) physical-nutritional; 3) physical-self-care; 4) drugs and driving; 5. social-environment; 6) emotional awareness; 7) emotional control; 8) intellectual; 9) occupational; 10) spiritual	>1 hour	Includes a charge for the assessment, which ranges from \$0.23 to \$1.20 per instrument per year to administer	Demonstrated strong internal consistency upon analysis (Palombi, 1992) ²¹	Hunter & Leeder (2013) found minimal support for the external validity of specific LAQ scales as specific measurements of wellness, especially those of the physical dimension. Demonstrated content validity. (Palombi, 1992) ²¹	This scale is not used regularly today. It was used in 4 studies that assessed undergraduate college students, college freshmen, wellness professionals.
WI	120	Examines 12 domains: 1.) self-responsibility and love; 2) breathing; 3) sensing; 4) eating; 5) moving; 6) feeling; 7) thinking; 8) playing and working; 9) communicating; 10) sex; 11) finding meaning; 12)transcending	>2 hours	N/A	Demonstrated strong internal consistency upon analysis (Palombi, 1992) ²¹	Demonstrated content validity (Palombi, 1992) ²¹	This scale is not used regularly today. It was used in 3 studies that assessed college undergraduate students, wellness professionals.
LCI	142	Assesses 7 distinct dimensions: 1) coping style actions; 2) nutritional actions; 3) physical care actions; 4) cognitive and emotional; 5) actions, low-risk actions; 6) environmental actions; 7) social support actions	>2 hours	N/A	Demonstrated strong internal consistency upon analysis (Palombi, 1992) ²¹	Demonstrated content validity (Palombi, 1992) ²¹	This scale is not used regularly today. It was used in 1 study that assessed undergraduate students age 18–50 years.
WEL	123	Comprises 5 second-order and 17 third-order dimensions— all are integrated into Wellness, a single higher order factor: 1) Creative Self (problem solving and creativity, sense of control, sense of humor, work, and emotional awareness); 2) Coping Self (realistic beliefs, leisure, stress management, and sense of worth); 3) Social Self (friendship and love); 4) Essential Self (spirituality, self-care, gender identity, and cultural identity); 5) Physical Self (exercise and nutrition)	>2 hours	1) Our reviewers unable to find publicly available copy of 4F-Wel; 2) Not readily accessible; developers require a \$15 charge for use; 3) 5F-Wel developers charge \$15 fee	All the questions (items) reliably measured with internal consistency	The most validated wellness assessment tool to date; considered the gold standard of evidence-based wellness measurement	Thorough analysis of the WEL led to the development of an updated WEL: the Five-Factor WEL (5F-Wel) (91 items), which has demonstrated substantially improved psychometric properties over the original WEL. The 5F-Wel has been further paired down into a newer and shorter instrument: The Four-Factor WEL (4F-Wel) (56 items). The 4F-Wel can provide reliable scores for 4 distinct aspects of wellness: cognitive-emotional, relational, physical, and spiritual. It was used in 7 studies that assessed Korean American adolescents, undergraduate students, military cadets, midlife women, and adolescents 12–15 years old.
PWS	36	Dynamic and bi-directional PWS founded upon 3 core aspects that are inherently shared across all models of wellness: 1) multidimensionality; 2) balance among dimensions; 3) autogenesis and measures of wellness in 6 different dimensions: A) physical; B) spiritual; C) psychological; D) social; E) emotional; F) intellectual	<30 min	Free online	N/A	Evaluated for internal validity; consistent with previous wellness studies in an outpatient setting; demonstrated construct validity (Adams TB et al, 1998 ³⁰)	The PWS measures perceived health, not wellness, a problem that can be pinpointed in its failure to address health-risk behaviors common among college students, such as alcohol/ drug use, safety factors, and sexual behaviors (disadvantage); however, it has excellent utility in a clinical medical setting and is well-researched and supported (advantage). It was used in 3 studies that assessed military cadets and undergraduate students.

TABLE 2, CONT. Wellness assessment instruments

NAME	ITEMS	DETAILS	TIME	ACCESSIBILITY	RELIABILITY	VALIDITY	NOTES
OLP	131	Focuses on self-discovery, preventive care, and healthy lifestyle habits, including measurements evaluating the dimensions 1) intellectual, 2) emotional, 3) social, 4) spiritual, 5) physical, 6) environmental health	15–20 min	Free online	Four of the 6 scales had test-retest stability above $r=0.820$	Evaluated for internal validity and found to be consistent with previous wellness studies in an outpatient setting; Hunter & Leeder (2013) ⁸ reported OLP had poor reliability and validity measures, indicating that more research needed to validate its use	The OLP was designed for a specific organization (Canyon Ranch) and has less literature supporting its use. It was used in 2 studies assessing military cadets.
HRA	N/A	Evaluates behaviors that contribute to health problems (e.g., smoking, drug use, alcohol use)	<1 hour	N/A	No data found within search parameters for the reliability	No data found within search parameters for the validity	Because our working definition of wellness depends on the absence of disease or illness, something these tools do not assess or account for, HRAs cannot accurately measure wellness. It was used in 2 studies, assessing Highmark Inc. employees and patients in community primary care practices.
BMS-WBCI	44	Measures 1) physical, 2) emotional, 3) intellectual, 4) occupational, 5) social, and 6) spiritual wellness dimensions	<1 hour	N/A	N/A	Researchers supported use of this instrument for evaluation of wellness among college population	The BMS-WBCI has been shown to be a strong and consistent measure of wellness among college students, although the assessment is limited to the population it addresses. It was used in 2 population studies, assessing college undergraduate students.
SWLS	5	Evaluates an individual's satisfaction with his or her life	5 mins	N/A	No data found within search parameters for the reliability	No data found within search parameters for the validity	It was used in 2 studies, assessing first-year family medicine residents and midlife women.
The Wellness Behavior Survey	14	Measures 1) diet/nutrition, 2) physical, 3) activity/exercise, 4) mind-body activities, 5) nurturing relationships, 6) sleep, 7) prayer, 8) being outdoors in nature, 9) tobacco and alcohol use, 10) prescription medication for mood or sleep	15 mins	N/A	No data found within search parameters for the reliability	No data found within search parameters for the validity	The Wellness Behavior Survey reflects an evaluation of the operational definition of wellness of Rachele et al (2013), ⁴² which emphasizes lifestyle behaviors that promote optimal states of being across multiple dimensions. It was used in 1 study, assessing first-year family medicine residents.
PWB	42 item	Measures 6 dimensions of wellness: 1) autonomy, 2) environmental mastery, 3) personal growth, 4) positive relations with others, 5) purpose in life, 6) self-acceptance Data suggest possible 5-factor model, which would combine indicators of Self-Acceptance and Environmental Mastery because they were highly correlated; originally, each dimension was operationalized with 20 items to be 120 items in total, but there are 18-item versions (each dimension is 3 items) and 42-item versions (each dimension is 7 items). The response scale was a 6-point continuum, ranging from completely disagree to completely agree.	<1 hour	N/A	The 120-item scale showed high internal consistency and test-retest reliability. In the 18-item scale, estimates of internal consistency were low to modest, which likely reflects the small number of indicators per scale. Therefore, the 42-item scale shows more internal consistency than the 18-item scale but still less than the original 120-item scale.	The 120-item scale showed convergent and discriminant validity with other measures; In the 18-item scale, 18 items continue to meet psychometric criteria, with each item correlating strongly and positively with only its own scale; comparison of the theory-based indicators of well-being with other frequently used measures indicated moderate-to-strong associations between 2 scales (Self-Acceptance and Environmental Mastery) and single- and multi-item scales of happiness, life satisfaction, and depression; the remaining 4 dimensions of well-being (Positive Relations With Others, Purpose in Life, Personal Growth, Autonomy) showed mixed or weak relationships with these prior indicators.	As mentioned above, there is a difference between wellness and well-being. It is possible for someone to be in a state of well-being but not wellness. Well-being is not as encompassing as wellness. This scale was used in 1 study assessing noninstitutionalized English-speaking adults ≥ 25 years of age.

N/A: not applicable; LAQ/TestWell: Lifestyle Assessment Questionnaire; WI: Wellness Inventory; LCI: Life Coping Inventory; WEL: Wellness Evaluation of Lifestyle; PWS: Perceived Wellness Survey; OLP: Optimal Living Profile; HRA: Web-based Health Risk Assessment programs; BMS-WBCI: Body-Mind-Spirit Wellness Behavior and Characteristic Inventory; SWLS: The Satisfaction With Life Survey; PWB: Ryff's psychological Well-being Scales