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REVIEW

Spotlight on eudaimonia and depression. A systematic review of the literature over the past 5 years

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Background and aim: Recent investigations pointed out to the important role of well-being in influencing physical and mental health, with robust findings for the dimension of depression. The aim of this systematic review is to provide an updated summary of articles focused on eudaimonia and depression, including psychosocial interventions that addressed both issues.

Method: The literature search was performed by entering the keywords: "eudaimonia" OR "eudaimonic well-being (EWB)" and "depression" and by limiting to "journal article" and to the English language. To be included in this, review articles had to present at least one EWB measure and one depression measure, and had to investigate young and adult populations, including populations with mental health disorders. Articles were excluded if they were published before 2014.

Results: Thirty-four articles were included, with a total of 81,987 participants. About the majority of participants were recruited in two twin studies, followed by college students, and by adults belonging to the general and clinical populations. Sixteen different instruments assessed eudaimonia, being Ryff's psychological well-being scale the most frequently used. The most used instrument for assessing depression was the Depression Anxiety Stress Scale, followed by Center for Epidemiological Studies Depression Scale. The studies confirmed the robust, inverse correlation between eudaimonia and depression, which was only partially explained by genetic common factors and which was mediated by other factors, as self-compassion, personality traits, and defense mechanisms. Various interventions were found to be effective both in promoting eudaimonia and in addressing depression, ranging from cognitive-behavioral therapy, acceptance and commitment therapy, mindfulness, to positive psychotherapy.

Conclusion: Clinicians, counselors, and practitioners can select different strategies to promote EWB and to address depression. The findings also suggest the need for a larger consensus on the definition of eudaimonia and on the specific measure(s) to evaluate it in different populations and in different life stages.

Keywords: eudaimonia, depression, well-being, recovery, adulthood, mental health

Introduction

The recent, growing research in positive psychology has focused on the domains of health and well-being and it distinguished between the hedonic approach and the eudaimonic one.[1–4] The concept of hedonic or subjective well-being refers to the pursuit of pleasure and the presence of a sense of life satisfaction.[5,6] The concept of eudaimonic well-being (EWB), on the other hand, refers to optimal human

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functioning and the endeavor to achieve meaningful goals in life.[2,4] It is referred to in the literature also as psychological well-being (PWB),[1,2] or personal expressiveness,[7] self-realization,[8] meaning in life,[9] or engaged/full life,[10,11] among others. Huta and Waterman[4] distilled eleven models with comprehensive measures of EWB, which included those referring to orientations, goals, and motivations and those involving emotional, cognitive, and social well-being components. According to Huta and Waterman, the model of EWB that received more consensus is the one proposed by Ryff,[2] which encompasses six interrelated dimensions: autonomy, purpose in life, positive relations, self-acceptance, personal growth, and environmental mastery. On the same vein, Waterman[7] and Ryan, and Huta and Deci[8] described eudaimonia as the capacity to develop oneself over time, by cultivating specific personal characteristics such as autonomy and self-determination, positive interpersonal functioning, and a sense of mastery in managing life circumstances. On the other hand, Steger et al[9] emphasized the dimension of meaning, which gives a sense of purpose to daily activities. Another different definition of eudaimonia derives from the model of "full life",[11] where the dimension of meaning is linked to the one of life engagement, as opposed to the "empty life", where meaning and engagement are lacking.

However, a comprehensive and unique approach to eudaimonia is not available in the current positive psychology literature. Furthermore, the term "eudaimonia" has become scientifically recognized and used in psychological literature only very recently.[4] This term has been generally applied to investigate the global "optimal" or "positive" functioning of individuals.[2,4] Under the EWBumbrella, thus, investigators measured and addressed either Ryff's model,[1,2] or Waterman's[7] or Ryan et al's one,[8] often without specific selection criteria.

Despite this variety of definitions and approaches, there is an emerging concordance in recent investigations, which points out to the important role of EWB in influencing physical and mental health. A recent review by Ryff[2] documented the significant inverse association between eudaimonia and mortality, chronic illness, and adverse health outcomes. Further investigations documented the same pattern of relationships, particularly for the dimension of purpose in life.[12,13] More recently, investigations about the genetic underpinning of EWB[14,15] shed more light on the biological mechanisms involved in this protective role for health. Higher levels of EWB (but not hedonic) were found to be associated with a diminished activation of the conserved transcriptional response to adversity (CTRA) mechanism. CTRA is characterized by increased expression of genes involved in inflammation and decreased expression of genes involved in antiviral and antibody responses. Thus, individuals with high levels of eudaimonia may present a healthier profile when confronted with stress, particularly when it comes from social situations or interactions.[16] This finding might also explain the strong, inverse correlations between eudaimonia and mental health.

The model of EWB proposed by Ryff,[1,2] in fact, was found to be negatively associated with depression in adults[17–21] older adults[22–24] and adolescent populations.[25–27] A pivotal longitudinal investigation[28] found that individuals with initial low EWB were over twice as likely to be depressed 10 years later compared to those with higher levels, after controlling for personality, negative functioning, prior depression, demographic, economic, and physical heath variables. In clinical settings, a specific sequential psychotherapy, which combined traditional cognitive-behavioral strategies with the promotion of eudaimonia (well-being therapy), was found to reduce the risk of relapse in recurrent depression up to 6 years.[18] Another study with older adults living in residential care demonstrated that one specific dimension of EWB – ie, environmental mastery – could predict up to 50% of the variance in participants' depression.[29]

Thus, a growing number of investigations suggested that EWB protects mental health, but few studies involved clinical samples.[30] The few exceptions suggested that factors relating to positive psychological functioning might be involved in the psychopathological mechanisms contributing to depression,[31] such as the difficulties in experiencing and maintaining positive emotions[32] or specific self-judgment bias.[33]

A recent systematic review[30] also found that EWB was impaired in adults with depression and other psychiatric disorders, and that the specific dimension of autonomy appeared to influence patients' motivation to seek and to adhere to treatment. The same review[30] documented that the impairments in EWB may be improved by specific interventions such as acceptance and commitment therapy, mindfulness, positive psychotherapy, or other positive interventions. Other recent meta-analyses[34,35] confirmed the efficacy of positive interventions – those explicitly aimed at promoting well-being – in improving well-being dimensions as well as in improving depression, or other symptoms of psychological distress. On the same vein, traditional interventions such as cognitive-behavioral therapy (CBT)

demonstrated their beneficial effects on both symptoms of depression and on indicators of positive functioning.[18,36,37] However, to the best of our knowledge, previous reviews and meta-analyses[30,34,35] addressed well-being and distress at a more general level, without scoping into eudaimonic dimensions and into their relationships with depression. Eudaimonia and depression appear to be connected by intertwined mechanisms. These mechanisms rely on the balance between positive and negative affects.[38,39] If treatment of symptoms induces improvement of EWB, it is conceivable that also changes in well-being may affect the balance of positive and negative affects and the depressive state of individuals.[40]

Shedding more light on these mechanisms appears to be fundamental, both in general and clinical populations. Considering the availability of previous literature and review articles,[2,34,35] and the rapidly growing research in this filed, an updated review on the relationship between eudaimonia and depression is the primary aim of the present article, which will be focused over the last 5 years. We selected this time frame since the term eudaimonia was systematically used in psychological literature only recently, particularly after Ryff's and Huta and Waterman's reviews.[2,4] In the present review, we aim to provide an updated summary of articles focused on eudaimonia and depression, including psychosocial interventions that addressed both issues.

Method

Design

A systematic review was performed in order to extract recently published scientific papers that dealt with measures of EWB and measures of depression in adult and emerging adult populations. We focused on the last 5 years (from 2014 on) in order to provide an update of the literature on eudaimonia and depression. The present review followed the guidelines for Preferred Reporting Items for Systematic reviews and Meta-Analyses.[41]

Search method

A systematic literature search was conducted on the following electronic databases: EBSCO host (PsychARTICLES, PsychINFO), PubMed, and Scopus. The literature search was performed by entering the keywords: "eudaimonia" OR "eudaimonic well-being" AND "depression" and by limiting to "journal article" and to the English language. Books, book chapters, dissertation or unpublished manuscript and review articles were excluded. No other search method was applied. Search strings were adapted according to the database, but spelling options were not permitted, in order to limit the results on the focus of the present review. The full search was conducted including articles up to January 2019. Additionally, reference lists of previous reviews or meta-analyses were screened in order to include potentially eligible studies.

Selection criteria

To be selected for this review, studies were required to 1) be full-text articles published in English, 2) include at least one EWB measure AND one depression measure, 3) investigate adult populations, including populations with mental health disorders. Articles were excluded if they were 4) published before 2014, 5) study protocols, 6) reviews, 7) validation studies, 8) qualitative investigations, and 9) if they included older adults or aging populations (>65 years old). This latter criterion was selected since depression in later life has specific clinical features, which include cognitive impairments, somatic complaints, specific treatments options, and clinical outcomes. Thus, the clinical characteristics of depression in this life stage are not comparable to those of other age populations, and articles were excluded if they entirely focused on older adults or aging populations, or community dwellers.

Search outcome

The first screening identified 365 articles. The majority of them were extracted from EBSCO host and Scopus databases. Only few articles were extracted from PubMed. After removing duplicates, 330 publications were identified and individually assessed based on the study's title and the information provided in the abstract (see review flowchart as depicted in Figure 1). Of these works, 224 papers were excluded according to the inclusion and exclusion criteria described above, while the full texts of 106 articles were examined before the decision was made to include them or not. Of these 106 articles, 50 papers did not assess EWB in combination with depressive measures and they were excluded.Further ten papers were excluded as they were published before 2014. Fourteen more papers were excluded, as they included only older adults or aging populations. Two additional articles were added out of manual screening of reference list. A total of 34 papers met all the inclusion criteria, and were included in the present review.

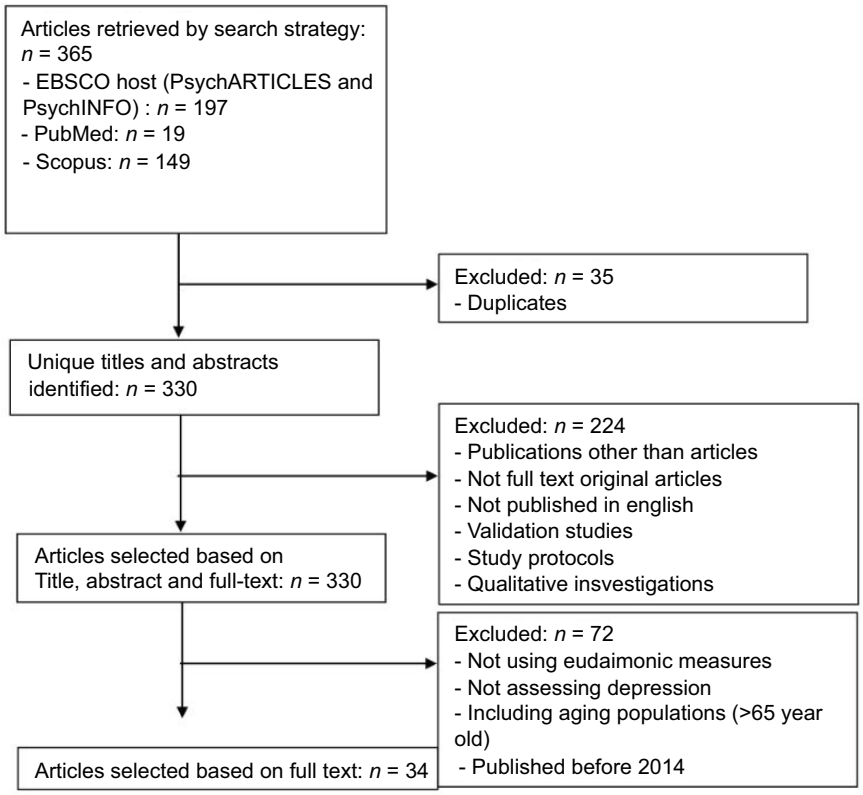

Figure 1 Review flowchart.

Data collection

The titles and abstracts for the articles assessed for potential inclusion were identified and independently inspected by one reviewer, who excluded duplicates and articles that clearly did not meet inclusion criteria. All potentially relevant articles were then fully assessed by another reviewer who decided upon inclusion. Uncertainty was resolved by coming to consensus. Data were extracted using a pre-designed template (see Table 1) with the following specified headings: measure of EWB and measure of depression used, country where the study was performed, population investigated, numbers of participants, study design, main objectives, and main results with effect sizes (when available).

Results

Thirty-four articles were included, with a total of 81,987 participants (including adolescents/ young adults and middle-aged individuals). Sixteen articles were cross-sectional (eight with a descriptive design, other eight with a comparative one). Other eight articles had a longitudinal design, six articles were randomized controlled studies, and other two studies included only twins and assessed genetic variables associated with EWB and depression. (see Table 2)

Instruments for assessing eudaimonia

Table 3 indicates the quantitative measures used for evaluating eudaimonia. The most used one was Ryff's PWB scale,[1] which was applied in 13 investigations[42–54] of 34. Ryff's PWB was used in its longer version (84 items) or in its shorter ones (42 or 18 items). Some investigations[42] applied just one dimension of the six included in the full model.

The second most used quantitative measure of eudaimonia was the Mental Health Continuum (MHC),[55] which was used in six investigations.[56–61] MHC was computed as a quantitative variable (the higher the score, the higher the well-being), or as a categorical variable for evaluating the conditions of flourishing, languishing, or moderate mental health.[55] Flourishing was also assessed with the Flourishing Scale[62] in two investigations.[51,63]

Eudaimonia was also measured with the Meaning in Life Questionnaire[9] in two articles,[48,64] with the Pemberton Happiness Index[65] in two articles,[47,66] with the Eudaimonic and Hedonic Happiness Investigation[67]

Table 1 Review template of eudaimonia and depression

Eudaimonia and depression						
Author (s) (year) and country	**Measurement**	**Population and sample size (mean age or age range)**	**Study design**	**Main objective (s)**	**Main results**	**Effect size (s)**
Avsec et al (2016)[74] Multicountry study	Orientations to Happiness (OTH) Questionnaire (18 items); Ryff's Psychological Well-being Scales (RPWB) – Short Version (18 items) Center for Epidemiological Studies Depression Scale (CES-D) 20 items	3690 participants aged 18–50 years recruited in seven countries	Cluster analyses, comparative analyses among clusters	To investigate how specific orientations to happiness combine within individuals in each of the seven samples, and how the clusters differed in terms of well-being and ill-being	Four clusters representing OTH emerged (Full, Empty, Pleasurable, and Meaningful life types) in all seven countries. In all seven countries, OTH types differed significantly regarding all measures, except for depressive symptoms in Mexican and Czech samples. Individuals classified into the Full life type reported the highest psychological well-being, the highest life satisfaction and the lowest depressive symptoms. Conversely, individuals in the Empty life reported the highest depressive symptoms and the lowest well-being.	Effec sizes ranging from η^2 0.16–0.22 for psychological well-being dimensions; η^2 0.04–0.11 for life satisfaction; and η^2 0.03–0.09 for depression
Bartrés-Faz et al (2018)[42] Spain	Orientation to Life Questionnaire (OLQ-13) 0.13 itmes Purpose in life subscale (from Ryff'PWB – 6 items Depression, Anxiety and Stress Scales (DASS) 21 items	1081 participants (mean age=52.0 years; 680 women) age range 40–65 years	Desciptive study, regressive analyses	To evaluate the association between sociodemographic variables, eudaimonic dimensions, and cognitive reserve with cognitive functioning and affective status.	Individuals with higher scores in eudaimonia reported better cognitive function and lower levels of negative affectivity. Age, gender, DASS score, cognitive reserve and eudaimonic well-being contributed to predict cognitive function. Better cognitive status was associated with a lower age, the male gender, and higher eudaimonic well-being. Conversely, negative affectivity, including depression, anxiety, and stress, only showed an association with eudaimonia, but not with cognitive reserve or cognitive functioning.	Small effect size for the association between purpose in life and age (η=0.07) and eudaimonia and gender (η^2<0.01)

(*Continued*)

Table 1 (Continued).

Eudaimonia and depression						
Author (s) (year) and country	**Measurement**	**Population and sample size (mean age or age range)**	**Study design**	**Main objective (s)**	**Main results**	**Effect size (s)**
Baselmans et al (2018)[76] The Netherlands	"Anxious/Depressed" subscale of the age-appropriate survey of the Achenbach's System of Empiricalbased Assessment Cantril Ladder 10 steps :10 indicates the best possible life, and 1 indicates the worst possible life.	43.427 twins between age 7 and 99 years	Twin-design, longitudinal	To gain insight into the etiology of the association between well-being and depressive symptoms across the lifespan, considering their genetic underpinnings	In childhood, genetic and environmental effects are about equally important in explaining the relationship between well-being and depressive symptoms. From adolescence onwards, the role of genetic effects increases compared to environmental effects.	Depressive symptoms were significantly higher in females, with large effect size observed at age 16 (Cohen's d=−0.62). At age 14 females reported also lower levels of well-being (Cohen's d=0.19). Small effect size (Cohen's d=0.3) for differences between monozigotes vs dizigotes twins
Bassi et al (2017)[43] Italy	Ryff PWB, 42 items Edinburgh Postnatal Depression Scale	81 pregnant women (mean age=33.9 years)	Longitudinal design	To explore the impact of parity and childbirth on both women's perinatal depression and psychological well-being.	Significant negative correlations observed between depression and psychological well-being dimensions. Depression did not differ between primiparous and multiparous women, or between pre- and postpartum assessments. By contrast, after childbirth, primiparous women reported higher values of environmental mastery and self-acceptance than multiparous women. Levels of self-acceptance and personal growth increased from pregnancy to postpartum among primiparous women, while no differences were detected over time in the scores of all the psychological well-being dimensions among multiparous women.	Higher eudaimonia in promiparous comapred to multiparous women: η=0.06 Main effect for increase in eudaimonia after child birth: η^2=0.30

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Table 1 (Continued).

Eudaimonia and depression						
Author (s) (year) and country	**Measurement**	**Population and sample size (mean age or age range)**	**Study design**	**Main objective (s)**	**Main results**	**Effect size (s)**
Bhullar et al (2014)[44] Australia	Ryff PWB – 84 items Depression Anxiety Stress Scales-21 (DASS-21 items)	207 Australian university students (Mean age=30.16 years)	Cross-sectional, comparative design	To identify profiles of PWB in a sample of Australian university students and to verify if these profile membership would predict depression.	Profiles 1 (2% of the sample) and 2 (10% of the sample) consisted of individuals who scored very low (Profile 1) or low (Profile 2) on all of six PWB scales. Profile 3 (25% of the sample) scores fell below the mean on five of the six PWB markers, but Autonomy. Individuals comprising Profiles 4 (33% of the sample) and 5 (30% of the sample) exhibited high (Profile 4) and very high (Profile 5) on all six indicators of PWB. There were significant differences between Profiles 1 and 2 and Profiles 4 and 5, with the latter groups reporting lower levels of depression.	Differeces among profiles ranging from η^2=0.46 to 0.85 for eudiamonic well-being; η^2=0.48 for differences in depression
Bohlmeijer et al (2015)[56] The Netherlands	Mental Health Continnum (MHC), 14 items, CES-D, 20 items	376 adults (mean age=42 years) with mild to moderate depressive symptoms	Randomized controlled trial with follow-up	To evaluate the impacts of a guided self-help intervention based on Acceptance and Committment Therapy (ACT) vs waiting list on flourishing	ACT had a positive effect on flourishing. Baseline levels of positive mental health and decrease in depressive sympotoms during treatment predicted flourishing at follow-up.	Not available
Brandel et al (2018)[45] Italy	Ryff's Psychological Well-being Scales 42 items Edinburgh Postnatal Depression Scale	50 pregnant couples (n=50 fathers-to-be; n=50 mothers-to-be; age range 24–53 years	Comparative and longitudinal design	To examine eudaimonic well-being during the transition to parenthood, considering depressive symptoms and gender differences.	Having a child increased well-being in both parents, but improvements were more robust for fathers. Gender differences accounted for 4.6% of the variance in postnatal eudaimonic well-being, while prenatal levels of eudaimonic well-being accounted for 70%.	Predictors of postmnatal eudiamonia: gender: η^2=0.46 baseline PWB: η^2.700, gender×change in depression η^2.009 change in depression: η^2.002

(*Continued*)

Table 1 (Continued).

Eudaimonia and depression						
Author (s) (year) and country	**Measurement**	**Population and sample size (mean age or age range)**	**Study design**	**Main objective (s)**	**Main results**	**Effect size (s)**
Brooks et al (2017)[73] Canada	Elevation Experience Scale 9 items DASS 21 items	121 undergraduate students (mean age=21.54 years)	Cross-sectional, 3 experimental studies	To show the beneficial effect of nature contact on mood and human well-being.	Across three different experiments, it was found that both actual and pictorial nature contact benefitted moods, even though actual nature was more effective. Nature contact of both types decreased depression and increased eudaimonic well-being. The authors suggest to use pictured nature as an emotion management technique suitable as a clinical treatment for mood disorders.	Pre-post effect of setting (actual vs picture contact with nature) η^2=0.116 Pre-post changes in positive affect and well-being η^2=0.769 Pre-post changes in depression η^2=0.112
Brown et al (2015)[75] Australia	Satisfaction with Life Scale (SWLS), Warwick–Edinburgh mental well-being scale (WEMWBS). CES-D.	206 women aged 40–60, (Mean age =53.64 years)	Cross-sectional study	To test two hypothesized models of well-being of midlife women, considering well-beng, depression and self-compassion	Psychological aspects of the menopause appear more strongly linked to well-being than physiological aspects such as menopausal stage and hot flush frequency. Self-compassion and beliefs about control of menopause are associated with well-being. No evidence found of a link between menopausal stage and depressive symptoms.	Not available
Browne et al (2017)[46] Canada, USA	Scales of Psychological Well-being – 18 items. Mental Health Recovery Measure (MHRM); Calgary Depression Scale for Schizophrenia (CDSS)	404 participants (mean age =23 years) who had experienced a single episode of non-affective psychosis assigned to active treatment or community care	Randomized controlled trial	(1) To examine the impact of treatment on PWB and mental health recovery, (2) to examine the impact of duration of untreated psychosis (DUP) on these outcomes, and (3) to examine the relationships among these outcomes and quality of life	PWB and mental health recovery improved over the course of the 2-year treatment. DUP was associated with the Positive Relationships and Environmental Mastery dimensions of PWB.	The intervention yielded fixed effect sizes (time×group) ranging from -0.16 (PWB) to −0.013 (MHRM)

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Table 1 (Continued).

Eudaimonia and depression						
Author (s) (year) and country	**Measurement**	**Population and sample size (mean age or age range)**	**Study design**	**Main objective (s)**	**Main results**	**Effect size (s)**
Chan et al 2015[64] USA	Meaning in Life Questionnaire (MLQ). Center for Epidemiologic Studies Depression scale (CES-D).	744 students (mean age=17.9 years)	Longitudinal study	To test associations between religiosity and sense of meaning and purpose and depressive symptoms.	Religiosity was more consistently linked with a greater sense of meaning and purpose than with fewer depressive symptoms across the transition to adulthood, suggesting that it may be particularly important for eudaimonic well-being.	Not available
Chaves et al (2016)[47] Spain	Beck Depression Inventory-II Penmberton Happiness Index, Ryff PWB	96 adult women (mean age =52.02 years) with a DSM-IV diagnosis of major depression or dysthymia	Randomized controlled trial	To compare the efficacy of a positive psychology intervention (PPI) with a cognitive-behavioral therapy (CBT)	Both interventions were effective in reducing psychopathology and increasing positive functioning, but there were no significant differences in terms of depressive symptoms, nor well-being dimensions	Effect sizes (time ×group interaction) ranged between η^2=0.006 and 0.01 for well-being measures; and from η^2=0.000 to 0.01 for distress measures
de Manincor et al (2016)[63] Australia	DASS 21 items Flourishing Scale 8 items Connor Resilience Scale Scale of Positive and Negative Experience (SPANE)	101 individuals (mean age=39.5 years) with mild to moderate depressive symptoms	Randomized controlled trial	To test the effectiveness of a 6-week individualized yoga intervention in the reduction of symptoms of depression and/or anxiety, and associated increases in mental health and well-being	There were statistically significant differences between yoga treatment and control group on reduction of depression and on improvement of mental well-being and resilience at post-therapy. These differences were not significant at a 6- week follow-up .	Adjusted mean differences (AMD) at post intervention ranged from −0.50 for depression to 0.47 for resilience to 0.27 for flourishing

(*Continued*)

Table 1 (Continued).

Eudaimonia and depression						
Author (s) (year) and country	**Measurement**	**Population and sample size (mean age or age range)**	**Study design**	**Main objective (s)**	**Main results**	**Effect size (s)**
Dezutter et al (2014)[48] USA	Meaning in Life- MLQ, Ryff PWB CES-D	8492 university students (mean age=19.98 year)	Descriptive study, cluster analyses	To identify distinct profiles based on the dimensions of Presence of Meaning and Search for Meaning in a sample of emerging adults.	5 clusters were found: "High Presence–High Search", "Undifferentiated" "High Presence–Low Search", "Low Presence–High Search", and "Low Presence–Low Search" Individuals in the High Presence–Low Search cluster reported the highest levels of positive psychosocial functioning, as well as the lowest levels of negative psychosocial functioning. Individuals in the Low Presence–Low Search cluster seemed to be the most poorly adapted group, with the lowest levels of positive psychosocial functioning and the highest levels of negative psychosocial functioning.	Effect sizes for differences among the clusters ranged from η^2=0.05 for depression to η^2=0.17 for eudaimonia and life satisfaction
Fianco et al (2015)[68] Italy	Caregiver Burden Inventory (CBI), Depression Anxiety Stress Scale (DASS), Eudaimonic and Hedonic Happiness Investigation (EHHI)	91 caregivers (mean age=50.4 years)	Cross-sectional study	To investigate the association between perceived levels of burden and well-being indicators among informal caregivers.	Participants perceiving high burden reported higher levels of depression lower life satisfaction and lower resilience than participants perceiving low burden. Life satisfaction was the best predictor of perceived burden, while depression did not provide significant contribution.	Not available
Grouden and Jose (2014)[57] New Zealand	Eudaimonic and Hedonic Happiness Investigation (EHHI). Mental Health Continuum (MHC) The Basic Psychological Needs Scale (BPNS) Depression Anxiety Stress Scales (DASS)	247 individuals (Mean age =44.28 years)	Cross-national study	To examine how central sources of meaning varied according to age, gender, and level of education, and whether these sources predicted well-being differentially	Family was the most important source of meaning in life, followed by interpersonal relationships, personal growth and work. Differences were found by age, gender, and amount of education. Younger individuals were more likely to find personal growth meaningful, whereas older people were more likely to find standard of living and community activities meaningful.	Multivariate main effect of age (partial η^2=0.08), for personal growth (η^2= 0.03). Main effect for educational level (η^2=0.09) on family

(*Continued*)

Table 1 (Continued).

Eudaimonia and depression						
Author (s) (year) and country	**Measurement**	**Population and sample size (mean age or age range)**	**Study design**	**Main objective (s)**	**Main results**	**Effect size (s)**
Hallam et al (2014)[77] Australia	Adolescent eudaimonic behaviors at age 19–20 years. DASS	991 young adults (age range: 19–24 years)	Cohort longitudinal study	To examine prospective relationships between adolescence eudaimonic values development and indicators of emotional competence and psychopathology in young adulthood	No evidence of a direct prospective relationship between adolescent eudaimonic behaviors and anxious-depressive symptoms. Findings suggest that eudaimonic values development in adolescence may indirectly reduce risk for anxious-depressive symptoms in young adulthood through a process of promoting emotional competence across emerging adulthood	Not available
Harris et al (2018)[49] UK, USA, Australia	Depression Anxiety Stress Scales (DASS- 21); Ryff 's Scales of Psychological Well- being (SPWB); Adult Hope Scale (AHS)	88 dental hygiene students (age range 18–49) from UK and Australia	Cross-sectional, comparative study	To explore United Kingdom and Australian dental hygiene and dental therapy students' perception of stress and well-being during their undergraduate education.	Purpose in life and self-acceptance positively correlated with hope agency, and negatively correlated with the depression subscale of the DASS. The majority of respondents reported levels of depression, anxiety and stress to be within the normal- to-moderate range. All students reported high levels of positive well-being, with no significant differences between the 2 countries.	Not available
Kryza-Lacombe et al (2018)[69] USA	Hedonic Eudaimonic Motives for Activities (HEMA) scale 9 items DASS	119 Undergraduate students (Mean age=21.24 years)	Cross-sectional study	To investigate hedonic and eudaimonic motives as predictors of academic achievement and negative emotional states in a sample of college students with diverse cultural and socioeconomic backgrounds	35 individuals (29.4%) fell into the Full Life group; 30 (25.2%) into the Eudaimonia Life group; 31 (26.1%) into the Hedonic Life group and 23 (19.3%) fell into the Empty Life group. Individuals with high levels of both Hedonia and Eudaimonia (the Full Life) had higher academic performance compared to individuals with low Eudaimonia. Eudaimonia was also significantly negatively associated with depression and stress	Differences among eudaimonia group on grade point average (GPA): η^2=0.10; on depression score:partial η^2= 0.08.

(*Continued*)

Table 1 (Continued).

Eudaimonia and depression						
Author (s) (year) and country	**Measurement**	**Population and sample size (mean age or age range)**	**Study design**	**Main objective (s)**	**Main results**	**Effect size (s)**
Merrick et al (2017)[70] UK	Hedonic and Eudaimonic Motives for Activities scale (HEMA-R). The Hospital Anxiety and Depression Scale (HADS).	99 participants from six organizations providing autism-specific adult services (years 42.2)	Cross-sectional, descriptive study	To investigate the relationships between motivational orientation (eudaimonic or hedonic), challenging behavior frequency and type and psychological impacts (anxiety, depression and life satisfaction).	Eudaimonic motivation significantly reduced the likelihood of anxiety while also predicted higher life satisfaction. Having high levels of eudaimonic motivation appeared to moderate the impact of weekly challenging behavior exposure on anxiety. No motivational orientation or challenging behavior factor significantly predicted depression.	Not available
Muñiz-Velázquez et al (2017)[66] Spain	Pemberton Happiness Index (11 items) Major Depression Inventory. Material Values Scale.	327 Spanish consumers (mean age=38.69 years)	Cross-sectional, decriptive study	To investigate the links between psychological well-being and materialism and between depression and materialism	Only explicit measures of materialism were associated with self-reported happiness and depression. Specifically, increased happiness and less depressive symptoms were observed in those participants with lower explicit materialism.	Not available
Osafo Hounkpatin et al (2015)[50] UK	Ryff Psychological Well-being (PWB) Centre for Epidemiological Studies-Depression (CES-D); Hostility : 3 item scale	Participants were from the Wisconsin Longitudinal Study (WLS), a cohort of 10,317 individuals (age range 53–65 years) who graduated from Wisconsin high schools in 1957	Longitudinal, cohort study	To examine how personality change relates to changes in other well-being measures such as depression, hostility, and life satisfaction in order to assess the importance of personality change for PWB over other well-being measures.	Personality change was significantly associated with change in psychological well-being (PWB). Moreover, personality change was more strongly related to change in PWB than changes in other well-being indicators such as depression, hostility and life satisfaction.	Not available

(*Continued*)

Table 1 (Continued).

Eudaimonia and depression						
Author (s) (year) and country	**Measurement**	**Population and sample size (mean age or age range)**	**Study design**	**Main objective (s)**	**Main results**	**Effect size (s)**
Pots et al (2014)[58] The Netherlands	CES-D Menatl Health Continuum MHC HADS	151 adults (mean age=48 years) from the general population	Randomized conntrolled study	To evaluate a community-based mindfullness intervention vs waiting list in adults with mild to moderate depressive symptomatology	Significant reductions in depression, anxiety, and improvements in mindfulness and mental health were found in the mindfullnes condition. These improvemets were maintained at follow-up	Moderate effect sizes on depressive symptoms at post-treatment (d=0.50) and follow-up (d=0.40). Moderate to large effect sizes on eudaimonia at post-treatment (d=0.34); and at follow-up (d=0.56).
Quitasol et al (2018).[71] Canada, Australia	Beck Depression Inventory-II (BDI-II) Balanced Measure of Psychological Needs (BMPN)..	51 patients with a diagnosis for major depressive disorder (mean age=35.30 years)	Randomized, controlled study, with a longitudinal design	To examine the role of psychological need fulfillment in a clinical sample undergoing treatment for major depressive disorder (CBT vs antidepressants).	Psychological need increased over the course of treatment and did not differ significantly between treatment conditions. Increases in psychological need were associated with decreases in depression severity over and above the effects of time, cognitive errors, and dysfunctional attitudes.	Not available
Ravert et al (2019)[52] USA	Waterman Questionnaire on Eudaimonic Well-being. Ryff' PWB 18 CES-D	8020 undergraduate students (mean age=20 years)	Cross-sectional study	To examine how sensation seeking was associated with well-being in a large, multiethnic sample of college-attending emerging adults.	Eudaimonic and psychological well-being were both associated with being female and with low levels of depressive symptoms. Eudaimonic and psychological well- being were found to be associated with high novelty seeking but with low intensity seeking, This latter dimnesion was associated with high levels of risk behavior. In contrast, novelty sensation seeking was not significantly associated with risk behavior.	Not available

(*Continued*)

Table 1 (Continued).

Eudaimonia and depression						
Author (s) (year) and country	**Measurement**	**Population and sample size (mean age or age range)**	**Study design**	**Main objective (s)**	**Main results**	**Effect size (s)**
Routledge et al (2016)[72] Australia, USA	Depression, Anxiety and Stress Scale (DASS-42); 26-item COMPAS-W scale of well-being;	1486 twins (mean age=39.79 years)	Cross-sectional, descriptive study	To examine the relationship between mental well-being and the normative range of anxiety and depression symptoms.	An absence of clinically significant symptoms of depression and anxiety did not necessarily indicate that an individual is flourishing. Both unique and shared genetic and environmental factors may determine why some individuals flourish in the absence of symptoms while others do not.	Not available
Schotanus-Dijkstra et al (2017)[51] The Netherlands, South Africa	14-item Mental Health Continuum MHC-SF, 8-item Flourishing Scale (FS); HADS-D	275 participants (mean age=48 years)	Randomized controlled trial, with longitudinal design	To examine a 9-week comprehensive positive self-help intervention with email support (TL-E) in enhancing well-being and flourishing and decreasing anxiety and depressive symptoms in a non-clinical sample.	At post-intervention, there were significant more improvements on mental well-being and depression in the email support group versus control group. The proportion of flourishing in the TL-E group increased from 7% to 30% after 3 months and to 34% after 6 months . All within group effects were maintained up to 12 months.	Effect size d for well-being measures ranged from d=0.34 to 0.69. Effect size d for depression: d=0.13
Seow et al (2016)[90] Singapore	Positive Mental Health instrument (47 items) 8-item Patient Health Questionnaire; Global assessment of functioning (interview)	218 outpatients with affective disorders (38.4 years)	Cross-sectional study	To assess the level of PMH, in a group of outpatients with affective disorders; to evaluate the sociodemographic and clinical correlates of PMH, and the association of PMH with life satisfaction and general functioning	The mean PMH total scores did not differ among groups across gender, ethnicity, education, diagnosis, and clinical status even though PMH scores varied largely within patients with depressive and anxiety disorders. PMH was associated with both life satisfaction and general functioning.	Not available

(*Continued*)

Table 1 (Continued).

Eudaimonia and depression						
Author (s) (year) and country	**Measurement**	**Population and sample size (mean age or age range)**	**Study design**	**Main objective (s)**	**Main results**	**Effect size (s)**
Singh et al (2015)[59] Italy, India	Mental Health Continuum (MHC) Depression Anxiety and Stress Scales-21, Strengths and Difficulties Questionnaire.	539 Indian students (age range: 13–18 years)	Cross–sectional, descriptive study	To estimate the prevalence of mental health in Indian adolescents and to examine its associations with mental distress and psychosocial functioning,	46.4% participants were flourishing, 51.2% were moderately mentally healthy, and only 2.4% were languishing. Flourishing students reported lower prevalence of depression and adjustment difficulties, and more prosocial behavior.	Differences according to flourishing groups had significant effects for adjustment difficulties (partial h=0.06) and for prosocial behaviors (partial h^2=0.09)
Tecuta and Tomba (2018)[53] Italy	Subjective Incompetence Scale (SIS), Beck Depression Inventory (BDI-II), Ryff Psychological Well-being Scales (PWB).	60 female outpatients with eating disorders (mean age =27.83 years)	Longitudinal study	To investigate subjective incompetence and whether its early modification in therapy was associated with treatment response in terms of both psychological distress and well-being.	Gains in three PWB dimensions (environmental mastery, purpose in life, self-acceptance) were predicted by changes in subjective incompetence and by levels of depression.	Partial η^2 for depression=0.318 (post-treatment)
Teismann et al (2018)[85] Germany	Positive mental health scale (PMH-scale DASS Clinical global impression – severity scale (CGI-S);	130 adult outpatients (mean age=41.98 years) suffering from panic disorder, agoraphobia, or specific phobia	Longitudinal study	To evaluate the asso ciation between (1) pre-treatment positive mental health and post-treatment remission status as well as symptom severity and between (2) post-treatment positive mental health, remission status and symptom severity at a 6-month follow-up	Pre-treatment positive mental health was the only predictor of post-treatment symptom severity and remission status. Post-treatment positive mental health and avoidance behavior predicted symptom severity and remission status at the follow-up assessment 6 months after treatment termination.	Not available
Trompetter et al (2017)[60] The Netherlands	Mental Health Continuum – Short Form (MHC-SF) Self-Compassion Scale 12-item Hospital Anxiety Depression Scale (HADS)	349 participants, (mean age=32.88 years)	Cross-sectional study	To assess if self-compassion mediated the relationship between positive mental health and psychopathology.	Self-compassion significantly mediated the negative relationship between positive mental health and psychopathology. Individuals with high levels of positive mental health possessed self-compassion skills that promoted resilience against psychopathology	k^2=0.22 (mediation of self-compassion on positive mental health and psychopathology)

(*Continued*)

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Table 1 (Continued).

Eudaimonia and depression						
Author (s) (year) and country	**Measurement**	**Population and sample size (mean age or age range)**	**Study design**	**Main objective (s)**	**Main results**	**Effect size (s)**
Walker and Lampropoulos (2014)[61] USA	MHC-SF, 14 items, CES-D Behavior Activation for Depression Scale	94 college students (mean age =20.67 years) with mild or more depressive symptoms	Randomized controlled trial	To compare the effects of different homework assignments (CBT or positive psychology intervention) vs waiting list on mental health, symptoms and positive states	Homework assignments based on CBT and positive psychology were equally effective in reducing depressive symptoms and increasing positive affect compared to a control group.	The intervention accounted for 24% of the variance in depression. Differences between control and active treatment: Cohen's d=1.38
Ziadni et al (2017)[54]	Ryff SPWB CES-D Defense Mechanisms Inventory (DMI;- 4 vignettes) Ego strengths short form	415 participants (mean age=48.3 years)	Cross-sectional and longitudinal study	To examine interrelationships among three affect regulation constructs: alexithymia, defense mechanisms, and ego strength and their influence on well-being and depression, both cross-sectionally and over a 6-year period	Alexithymia and depression and well-being dimensions were inversely correlated and correlated to the use of immature defense mechanisms. Well-being dimensions were significantly associated with the use of more mature defense and with higher ego strengts. low alexithymia, more mature defenses, and high ego strength at baseline predicted increases in well-being, but not changes in depression 6 years later, suggesting an important difference between well-being and depression in long-term outcomes.	Not available

Table 2 Type of studies included in the review

Type of study	Number of articles
Cross-sectional (comparative design)	8[44,48,52,57,69,73,74,90]
Cross-sectional (descriptive design)	8[42,49,59,60,66,68,70,75]
Longitudinal study	8[43,45,50,53,54,64,77,85]
Twin study	2[72,76]
Randomized controlled study	8[46,47,51,56,58,61,63,71]

in other two articles,[57,68] and with the Hedonic and Eudaimonic Motives for Activities[3] in other two articles.[69,70]

Table 3 Instruments used to assess eudaimonia and depression

Measures of eudaimonia	Number of articles
Psychological Well-being scale - PWB[1]	13[42–54]
Mental Health Continuum (MHC)[56]	6[56–61]
Meaning in Life Questionnaire (MLQ)[9]	2[48,64]
Flourishing Scale[62]	2[51,63]
Eudaimonic and Hedonic Happiness Investigation (EHHI)[67]	2[57,68]
Pemberton Happiness Index[65]	2[47,66]
Hedonic and Eudaimonic Motives for Activities (HEMA)[4]	2[69,70]
Adolescents Eudaimonic Behavior – Social Capital[83]	1[77]
Balanced Measure of Psychological Needs (BMPN)[78]	1[71]
Basic Psychological Needs Scale[80]	1[57]
Cantril Ladder[82]	1[76]
COMPAS-W of well-being[80]	1[72]
Elevation Experience Scale[3]	1[73]
Orienation to happiness[11]	1[74]
Questionnaire for Eudaimonic Well-being[7]	1[52]
Warwick–Edinburgh Mental Well-being[81]	1[75]
Measures of depression	
Depression Anxiety Stress Scale – DASS[84]	11[42,44,49,59,63,68,69,72,73,77,85]
Centers for Epidemiological Studies – Depression (CES-D)[86]	10[48,50,52,54,56,58,61,64,74,75]
Hospital Anxiety and Depression Scales (HADS)[87]	4[51,58,60,70]
Beck Depression Inventory[88]	3[47,53,71]
Edinburgh Postnatal Depression[89]	2[43,45]
Anxiety and Depression Subscale Achenbach System of Empirical-based Assessment[91]	1[76]
Clagary Depression Scale[92]	1[46]
Behavior Activation for Depression Scale[93]	1[61]
Major Depressive Inventory[94]	1[66]
Patient Health Questionnarie[95]	1[90]

Other nine articles[52,57,71–77] assessed eudaimonia with nine additional instruments: the Balanced Measure of Psychological Needs,[78] the Basic Psychological Needs Scale,[79] the COMPAS-W of well-being,[80] the Elevation Experience Scale,[3] the Orientation to Happiness Scale,[11] the Questionnaire for Eudaimonic Well-being,[7] the Warwick Edinburgh mental well-being scale,[81] the Cantril Ladder scale,[82] and the Adolescents Eudaimonic Behavior,[83] respectively.

In conclusion, eudaimonia was assessed with 16 different quantitative measures, being Ryff's PWB and Keyes's MHC the most frequently used (see Table 3).

Instruments for assessing depression

Table 3 indicates the quantitative measures used for evaluating depression. The most used one was the Depression Anxiety and Stress Scale (DASS),[84] which was applied in 11[42,44,49,59,63,68,69,72,73,77,85] of 34 studies. DASS was used in its complete version or by selecting only the depression subscale.[44] The second most used quantitative measure of depression was the Center for Epidemiological Studies Depression Scale (CES-D),[86] which was used in ten investigations.[48,50,52,54,56,58,61,64,74,75]

Depression was also measured with the Hospital Anxiety and Depression Scale (HADS)[87] in four articles,[51,58,60,70] with Beck Depression Inventory[88] in three articles,[47,53,71] with the Edinburgh Postnatal Depression Scale[89] in two articles.[43,45]

Other five articles[46,61,66,76,90] assessed depression with Anxiety and Depression Subscale of the Achenbach System of Empirical-based Assessment,[91] with the Calgary Depression Scale,[92] with the Behavior Activation for Depression Scale,[93] with the Major Depressive Inventory[94] and with the Patient Health Questionnaire,[95] respectively.

In conclusion, depression was assessed with 10 different quantitative measures (see Table 3).

Populations included

Table 4 summarizes the type and the total number of participants evaluated in the 34 selected articles. The populations included ranged from adults within the general and clinical populations, to college/ university students, to adolescents and to young adults entering adulthood. A total of 81,987 individuals were included.

Twin studies

Almost half of the total sample was recruited in two twin studies,[72,76] aimed at investigating the genetic underpinning of EWB and depression/negative affectivity. The first

Table 4 Populations evaluated in eudaimonia and depression

Type of populations	Number of articles	Number of individuals
Twins	2[72,76]	44,913
Young populations, college, or university students	10[44,48,49,52,59,61,64,69,73,77]	19,415
Adult, general populations	14[3,5,42,45,50,51,54,57,60,70,74,75,84]	17,429
Adult clinical populations (anxiety, depressive disorders, and eating psychotic disorders)	8[46,47,53,56,63,71,85,90]	1436
Total number of individuals		81,987

study[76] had a longitudinal design and was focused on examining the association between EWB and depression across the lifespan in 43,427 twins. It was found that EWB and depressive symptoms were significantly correlated and the correlation increased with age, ranging from −0.34 during childhood to −0.49 in adulthood, with the highest correlations in young adults (−0.57). Bivariate twin models revealed that shared environmental factors played an important role in explaining the relationship between eudaimonic well-being and depressive symptoms in childhood, while in adolescence and adulthood genetic factors became increasingly important.

Similarly, Routledge et al[72] found that genetic factors contributed to about half of the phenotypic correlation between depression and anxiety symptoms and well-being (ie, 56.34%) in a sample of 1486 Australian twins who were classified into the normative levels of depression. However, authors found that two-thirds of the total variance in EWB scores was completely distinct from anxiety and depression, as measured with the DASS. Authors suggested that the majority of genetic and environmental factors influencing EWB do not impact anxiety and depressive symptoms. Moreover, authors also found a gap between the assessment of distress and the presence of optimal well-being: 93% of their twin participants were classified into the normal range of symptoms, but only 23% of them were also classified as "flourishing" on the COMPAS-W well-being scale.[80] Authors concluded that both unique and shared genetic and environmental factors may determine why some individuals flourish in the absence of symptoms, while others do not.

Young populations, college, and university students

The second large category of population included in the present review is the one composed by college and university students. Ten different investigations focused on this category. The one including most of the college students[48] (N=8492) assessed eudaimonia with Ryff's scale,[1] together with Meaning in Life Questionnaire,[9] and depression was measured with the CES-D.[86] College students were classified into five clusters, according to the different combination of the presence of meaning in life versus search for meaning. Individuals in the High Presence–Low Search cluster reported the highest levels of positive psychosocial functioning, as well as the lowest levels of depression. Meaning in life was measured in another investigation[64] with 744 American college students. Also in this case, meaning in life was strongly associated with purpose in life and with depression. Importantly, authors found that religiosity was an important source of meaning and emphasized its role for promoting eudaimonia.

On the same vein, Kryza et al[69] applied a classification of 119 undergraduate students based on their levels of eudaimonia in order to predict academic achievements and negative emotional states. Authors used the HEMA measure[3] for identifying four groups of students: the Full Life group (scores at or above the median on both Hedonia and Eudaimonia scales), the Eudaimonia Life group (scores at or above the median on Eudaimonia, but below the median on Hedonia), the Hedonic Life group (scores below the median on Eudaimonia, but at or above the median on Hedonia), Empty Life group (scores below the median on both Hedonia and Eudaimonia scales). Individuals in the Full Life group had higher academic performance compared to students with low Eudaimonia. Eudaimonia was also significantly negatively associated with depression and stress, measured with the DASS questionnaire.[84]

Similarly, Bhullar et al[44] aimed at classifying 207 Australian university students in 5 clusters, according to their levels of EWB, ranging from low to very high levels in all Ryff's six domains.[1] Thirty percent of the sample exhibited high and very high levels on all six indicators of PWB, and they had also lower levels of depression, compared to individuals classified in low profile of EWB.

Another group of 88 Australian university students[49] was assessed with Ryff's scale[1] and with DASS[84] and was

compared to a matched group of British students. No significant differences emerged between these groups, but eudaimonia was consistently and negatively correlated to depression in both groups.

Another Canadian investigation[73] confirmed the inverse correlations between eudaimonia and depression in 121 undergraduate students. In this case, the authors[73] aimed at demonstrating the beneficial effect of nature on mental health. Three different experiments showed that the conditions of virtual and real contact with nature increased EWB and decreased depression (measured with the DASS).

Another study[61] assigned 94 university students with mild to moderate depression to different treatment conditions based on homework assignment, including standard CBT or a positive psychology intervention. Homework assignments based on CBT and positive psychology were equally effective in reducing depressive symptoms and increasing EWB, compared to a waiting list (WL) control group.

Finally, the other investigation with a large multiethnic sample of college students (N=8020) aimed at examining the relationship between sensation seeking and eudaimonia.[52] Female gender and low depressive symptoms were associated with eudaimonia, which was associated with high novelty seeking. However, novelty seeking was manifested with a low-intensity pattern, which was not correlated to risky behavior.

Eudaimonia was also assessed in two studies involving young populations, not recruited in college institutions. The first[59] one included 539 Indian adolescents and found that 46.4% of the participants were flourishing, 51.2% were moderately mentally healthy, and only 2.4% were languishing. The flourishing Indians reported lower prevalence of depression and more prosocial behaviors. The second study[77] included a large cohort of Australians (N=991) and, with a prospective design, it was found that eudaimonia was not directly related to the development of anxious-depressive symptoms. Rather, authors (Hallam et al)[77] suggested that eudaimonia in adolescence may indirectly reduce the risk for anxious-depressive symptoms by promoting emotional competence across emerging adulthood.

In conclusions, eudaimonia and depression were found to be negatively correlated in young populations, and college/university students. In these age populations, the presence of high levels of eudaimonia was found to be predictive of higher academic success, of higher meaning in life, lower distress and lower risky behaviors. Furthermore, traditional CBT interventions, psychological interventions based on positive psychology or based on the contact with nature were found to be effective either in addressing depression or in promoting eudaimonia.

Adult general populations

Fourteen studies evaluated EWB and depression in the general population, including a total of 17,429 individuals.

In the largest one,[50] a cohort of 10,317 individuals recruited in the Wisconsin Longitudinal Study was evaluated in terms of eudaimonia, depression, and personality dimensions. Over time, personality change was more strongly related to change in eudaimonia than changes in other indicators, such as depression, hostility, and life satisfaction.

In another large, international study[74] 3690 participants were recruited in 7 different countries, and they were classified into 4 clusters, according to their levels of eudaimonia. Authors used the Orientation to Happiness questionnaire[11] in order to classify individuals into the Full, Empty, Pleasurable, and Meaningful life groups. In all seven countries, individuals classified into the Full Life type reported the highest PWB, the highest life satisfaction, and the lowest depressive symptoms, compared to individuals in the Empty life, who reported the highest depressive symptoms and the lowest well-being.

Another cross-sectional study[57] found that eudaimonia was associated with meaning in life in a sample of 247 individuals from New Zealand. In particular, family was the most important source of meaning in life, followed by interpersonal relationships, personal growth, and work.

In other three investigations, eudaimonia and depression were associated with materialism,[66] self-compassion,[60] and with ego strengths and with the use of specific defense mechanisms.[54] In the first case,[66] eudaimonia and depressive symptoms were measured in a group of 327 Spanish individuals. Those participants with lower explicit materialism reported more EWB and less depressive symptoms. The second study[60] found that the relationship between EWB (measured with the MHC[55]) and depression was mediated by participants' (N=349) levels of self-compassion. Accordingly, individuals with high levels of positive mental health possessed self-compassion skills that promoted resilience against psychopathology (measured with the HADS). The third study,[54] which included more than 400 participants, found that depression and EWB dimensions were inversely correlated and correlated to the use of specific defense mechanisms. Eudaimonic well-being dimensions were significantly associated with the use of

more mature defenses and with higher ego strengths. Importantly, over a 6-year time, it was found that more mature defenses and high ego strength at baseline predicted increases in EWB, but not changes in depression. These findings suggest an important difference between EWB and depression in long-term outcomes.

Two studies examined eudaimonia and depression during the transition to parenthood. The first one[43] focused on 81 mothers and distinguished primiparous from multiparous. Their levels of depressive symptoms did not differ, nor did they change after childbirth. By contrast, after childbirth, primiparous women reported higher environmental mastery and self-acceptance than multiparous women. The second investigation[45] focused on 50 fathers and found that their levels of eudaimonia increased after childbirth, more than those of mothers. However, at postpartum, EWB was largely predicted by pre-natal levels in both parents.

Two other studies examined two other features related to eudaimonia and depression in midlife, namely the cognitive reserve[42] and the menopausal symptoms.[75] In the first case, it was found that a better cognitive status was associated with a lower age, the male gender, and higher EWB in 1081 participants. Conversely, negative affectivity, including depression, anxiety, and stress, only showed an association with eudaimonia, but not with cognitive reserve or cognitive functioning. The second study[75] included a sample of 206 Australian women assessed with the Warwick Edinburgh mental well-being[81] and the CES-D.[86] Psychological aspects of the menopause appeared more strongly linked to EWB than physiological aspects (such as menopausal stage and hot flush frequency). No evidence was found of a link between menopausal stage and depressive symptoms in the sample. The dimension of self-compassion was strongly associated with EWB also in this sample.

Other two studies associated eudaimonia and depression with providing help and support to others, either as a caregiver, or as a member of helping professions. The first study[68] found that 91 caregivers with high burden reported higher levels of depression, lower life satisfaction, and lower resilience. Life satisfaction and resilience were also found to predict perceived burden. The second study[70] involved 99 staff members of organizations providing professional help for autistic patients. The authors studied their levels of motivation with the HEMA and found that eudaimonic motivation significantly reduced the likelihood of anxiety while it also predicted higher life satisfaction. However, depression was not predicted by eudaimonic motivation. The authors recommended to test the effect of interventions in promoting eudaimonic motivation in these staff members, since they may help their assisted patients in framing psychological distress as an opportunity for personal development.

Finally, two Randomized Controlled Trial (RCT) studies evaluated the impact of a positive self-help intervention[51] and of a community mindfulness intervention[58] in promoting EWB and improving psychological distress in non-clinical samples. The first one[51] showed that a 9-week positive intervention improved the proportion of flourishing individuals (N=275) from 7% to 30% after 3 months and to 34% after 6 months. The second study[58] demonstrated significant reductions in depression, anxiety, and improvements in mindfulness and mental health in participants (N=151) treated with a mindfulness group intervention. Importantly, these improvements were maintained at follow-up.

In conclusions, the 14 articles focused on adult general populations found that eudaimonia and depression are inversely correlated. They also showed different pattern of correlations with personality factors, defense mechanisms, materialism, and cognitive reserve, among others. Eudaimonia and depression were found to be related to specific phases of life, such as becoming a parent or entering menopause. Self-compassion, resilience, and meaning in life presented a high influence on eudaimonia and in some cases, they also mediated the relationship between eudaimonia and depression.

Adult clinical populations

Eight investigations focused on clinical populations: four are RCT,[47,56,63,71] three[46,53,85] have a longitudinal design (pre-post intervention assessments), and one[90] is cross-sectional. Eudaimonia and depression were assessed in 1436 individuals reporting mild to moderate depression or dysthymia, affective disorders (anxiety and depression), anxiety disorders, non-affective psychosis, or eating disorders. Most of these clinical trials relied on the concept of "mental health continuum",[55,97] where psychopathology and EWB have a reciprocal influence. Hence, targeting one may result in beneficial effect on the other, or vice-versa.

Four investigations were explicitly focused on patients with depressive disorders and they all are RCT. Chaves[47] compared the efficacy of a positive psychology interventionwith a traditional CBT in 96 patients with major

depressive disorder or dysthymia and found that both interventions were effective in reducing psychopathology and increasing positive functioning. However, there were no significant differences in terms of depressive symptoms, nor EWB dimensions between the two treatments. In a subsequent analyses,[96] authors documented that the only significant difference between conditions was client satisfaction, which was higher in the Positive Psychology Intervention (PPI) group. Similarly, Quitasol[71] applied a protocol of CBT and compared its efficacy with standard antidepressant treatment in a sample of 51 depressed patients, whose psychological needs fulfillment was observed over the course of treatment. Authors found that they did not differ significantly between treatment conditions, but increases in need fulfillment during treatment were associated with decreases in depression severity. Authors suggested to dedicate more attention to the dimension of psychological need fulfillment in the treatment of depression. On the other hand, Bohlmeijer et al[56] and de Manincor et al[63] applied new forms of treatment for depressive patients and compared them to a WL condition. Bohlmeijer et al[56] aimed at evaluating the impacts of a guided self-help intervention based on acceptance and commitment therapy (ACT) on promoting flourishing, measured with MHC in a sample of 376 individuals. The study found that in the ACT condition, almost 30% of the participants were flourishing, whereas this percentage was about 14% for participants in the WL. From baseline to post-intervention, 24% of the participants improved from not-flourishing to flourishing in the ACT condition, as compared to 10.3% in the WL condition. In the ACT condition, the predictors of flourishing at post-intervention were: higher level of positive mental health at baseline, lower levels of depressive symptoms at baseline along with a larger decrease in depressive symptoms during the intervention, and larger increases in psychological flexibility during the intervention. Authors suggested that ACT targets both underlying factors of psychopathology and factors of EWB and flourishing (eg, value clarification and goal-setting). Similarly, de Manincor et al[63] found that a 6-week individualized yoga intervention significantly reduced depressive symptoms and promoted flourishing and resilience in 101 depressed patients, when compared to WL. However, these differences between treatment conditions disappeared after 6 weeks.

With a cross-sectional design, Seow et al[90] analyzed the clinical and sociodemographic variables associated with positive mental health in a group of patients with depressive and anxiety disorders (N=2018). The study revealed that positive mental health was significantly associated with life satisfaction and general functioning even after controlling for sociodemographic and clinical variables. Emotional support was found to have a role on depressive symptoms. A younger age with early onset of the disorders was associated with lower positive mental health. However, authors reported a higher variability in positive mental health in this group of outpatients, and these data confirmed the dual model continuum of mental health.[97]

Similarly, Teisman et al[85] measured positive mental health in a sample of 130 patients with various anxiety disorders (phobias, panic attack, agoraphobia) and found that it was the only significant predictor of post-treatment symptom severity and remission status. Authors also applied a longitudinal evaluation and found that post-treatment positive mental health predicted symptom severity and remission status 6 months after treatment termination. The second longitudinal study[46] aimed at evaluating the relationship between eudaimonia and recovery in a sample of 404 patients with psychosis. Authors found that the duration of untreated psychosis was associated with the dimensions of positive relationships and environmental mastery. Active treatment (compared to community care) significantly improved eudaimonia and triggered recovery in psychotic patients. Lastly, with another longitudinal design, Tecuta and Tomba[53] evaluated EWB and depressive symptoms in a sample of 60 outpatients with eating disorders treated with CBT. Changes in depressive symptoms and in subjective incompetence predicted improvements in EWB, particularly in the dimensions of environmental mastery, purpose in life, and self-acceptance.

In conclusions, depression and eudaimonia were found to be inversely correlated in clinical populations. In these groups, the two variables were mostly studied during the course of interventions, including pharmacotherapy or psychotherapy. The treatments applied to address depression and eudaimonia were ACT, CBT, or PPT. Across studies, baseline levels of eudaimonia were significant predictors of recovery, relapse, or flourishing at post-interventions.

Discussion

The aim of the present systematic review was to provide an updated summary of articles that evaluated eudaimonia together with depressive symptoms. These issues have been previously investigated, and it was found that

eudaimonia could have a protective role for mental health, and that its absence was found to be a risk factor for developing depression.[28] However, previous literature also highlighted the paucity of studies involving clinical populations, and the heterogeneity of assessment tools used to evaluate eudaimonia.[30] Furthermore, it was found that interventions aimed at addressing depression also promoted eudaimonia.[18,98] On the other hand, positive interventions focused on promoting eudaimonia were found to yield benefits to depressive symptoms.[35,99] Another relatively new field of investigation is the common biological or genetic underpinnings that the two phenomena may share.[14] Studies on all these issues did not reach definitive conclusions, yet.

The present review provides a first effort in order to address them, by analyzing published works in the recent scientific literature (over the past 5 years). We identified 34 articles, with a total of 81,987 participants (including adolescents/young adults and middle-aged individuals). Eight articles included clinical populations, presenting mood, anxiety, eating, and psychotic disorders. Two large, twin studies examined the genetic underpinnings of eudaimonia and depression, four studies examined eudaimonia and depression in peculiar life stages, such as adolescence, middle age, or during the transition to parenthood. Another large number of articles included young populations recruited in college/university settings. Thus, a first observation that could be drawn is that this review addresses previous limitations of the literature by exploring eudaimonia and depression in a variety of populations, including large clinical samples.

Eudaimonia was assessed mainly with the Ryff's PWB scale,[1] followed by the MHC.[55] Interestingly, MHC shares the same conceptual framework of the PWB, with six items of 14 derived directly from PWB. However, the specific advantage of using MHC relied on the possibility of categorizing individuals as languishing or flourishing according to specific criteria and scores. Eudaimonia, in this case, was conceived as a state of flourishing, or a state of positive mental health.[55] In any case, the state of flourishing was almost consistently associated with lower levels of depression or a better recovery after clinical interventions.[56,60] Thus, the use of flourishing diagnoses might provide clinicians a more comprehensive understanding of an individual's mental health, or it may be used as an indicator of recovery after clinical interventions.[55]

However, other investigations used different models for conceptualizing eudaimonia, such as need fulfillment,[3] orientation to happiness,[11] or meaning in life,[9] among others. Accordingly, individuals were categorized in different groups, such as belonging to the Full Life group, or the Eudaimonia Life group, or to the Presence of Meaning group. In any case, the results are similar across all these investigations: individuals belonging to those categories presented lower levels of depression compared to those classified into the Empty Life group, the Hedonic Life group, or the search for meaning group. Thus, these results provide confirmation to the inverse relationship between eudaimonia and depression. They also confirm the protective role of eudaimonia for mental health, across the population examined (clinical, adults, college students, etc.).

On a different level, these results also confirm the existing heterogeneity of definitions of eudaimonia and the use of different assessment instruments for its evaluation.[30] Depression was similarly assessed with eight different tools, being the DASS[84] the most frequently applied across the 34 studies. Unfortunately, most of the investigations assessed depression by self-report measures only, and this may limit the clinical sensitivity of the evaluation. However, the definition and the clinical characteristics of depression are well established by pre-existing clinical research. In order to be able to generalize and replicate findings on eudaimonia and its association with depression, it would be recommendable to reach for a larger consensus on the definition of eudaimonia and on its most appropriate instrument(s) of assessment.

Beyond its protective role for mental health, EWB has been recently investigated in its biological and/or genetic underpinnings, which might explain its influence on physical health as well.[14–16] Two twin studies[72,76] in the present review confirmed the impact of genetic variables in determining the correlations between EWB and depression. These two studies did not assess the CTRA response.[14] However, these studies[72,76] included large samples and they identified different patterns of genetic influence across life stages and between different groups of individuals, ranging from 1/3 of common genetic factors to almost 50%. In spite of this, both studies[72,76] concluded by emphasizing the role of environmental factors – which become particularly important in late adulthood – for explaining most of the variability and for identifying individuals who flourish from those who do not. A better understanding of the common biological underpinnings between depression and eudaimonia is a necessary purpose for future research.

Finally, this review summarized different interventions which were found to be effective in promoting eudaimonia and in addressing depression. These interventions ranged from traditional clinical approaches – such as pharmacotherapy or cognitive-behavioral treatment –[61] to third-generation psychotherapies – such as Acceptance and Commitment Therapy[56] or Mindfulness –[58] to newly developed interventions, derived from the positive psychology perspective (ie, positive psychotherapy).[47] Interventions also included mind–body approaches, such as yoga therapy[63] or contact with nature.[73] When compared to WT or to controlled conditions, these interventions were found to be more effective, and generally they were appreciated by participants.[96] Thus, clinicians, counselors, and practitioners can select different strategies to promote EWB and to address depressive symptoms, according to participants' clinical status, or best preference.

Despite the updated findings reported by this review, it has also some limitations. First of all, it is possible that we may have missed in-press articles or articles not written and published in English, since research on EWB is rapidly expanding all over the world. Hence, it is to be expected that a larger number of studies will be available at a future point. Furthermore, this investigation included instruments that only measured EWB together with measures of depression. Thus, articles designed to assess other dimensions of well-being (eg, life satisfaction, positive emotions, subjective well-being, etc.) or other elements (ie, only meaning in life or resilience) were not regarded. Even though we are aware that these dimensions of positive functioning may present important relationships with depression, we opted to select measures of EWB in order to derive a more specific pattern of correlation with depression. Similarly, we excluded articles pertaining to eudaimonia and depression in older adults. Considering the important roles of these two dimensions in influencing aging processes, future review articles should address eudaimonia and depression in this specific population.

In conclusion, this review highlights the need for future research to reach more consensus on the definition of eudaimonia and on the specific measure(s) to evaluate it in different populations and in different life stages, ranging from children to middle age. Importantly, this review confirms the inverse correlations between eudaimonia and depression, and thus, its crucial role in clinical and developmental settings. As a consequence, the presence of EWB should be monitored longitudinally across different life stages, particularly when existential changes may occur (ie, from adolescence to adulthood, or during the transition to parenthood, or when entering middle age and retirement). Finally, findings of this review suggested that EWB could be promoted by different interventions, and its presence should be considered as a key clinical indicator of recovery from depression or from other mental disorders.

Disclosure

The authors have no conflicts of interest to declare in this work.

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