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Assessing psychosocial well-being of adolescents: a systematic review of measuring instruments

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Abstract

Background The paradigm shift from the clinically deficit-oriented approach to that of educationally strength-based model in assessing adolescents' psychosocial well-being has brought about a recent increase in school-based health promotion and prevention initiatives. This prompted this systematic review of measuring instruments designed to assess psychosocial well-being of children and adolescents.

Methods Using electronic databases on Academic Search Premier, MEDLINE, PROQUEST, PsycINFO, CINAHL Plus and Psychosocial and Health Instrument, a systematic review of literature of measuring instruments was conducted from their inception to December 2009 using the keywords of child, emotion, assessment, scale and measure. Measuring instruments from selected articles were critically appraised using a predetermined set of quality indicators which guided the rating of the psychometric properties of the instruments into grades of A, B, and C. The constructs of psychosocial well-being from the measuring instruments were categorized into themes.

Results Twenty-nine out of the 908 articles met the inclusion criteria. Seventeen instruments identified from the selected articles were examined using preset quality indicators. In construct building, the themes identified from the strength-based instruments distinguished the construct of psychosocial well-being primarily into the dimensions of personal emotional competency and social functioning. In the ratings of psychometric properties, one instrument was rated 5A, five rated 4A and four rated 3A. For reliability testing, eight measures received grade A when their intraclass correlation is higher than 0.7; whereas only two instruments reported sensitivity and none investigated responsiveness.

Conclusions Strength-based measures focusing on social emotional behavioural outcomes open up a possibility to link up assessment with promotion of psychosocial well-being, away from clinical settings and into adolescents' homes, schools and community. Future research should focus more on investigating the sensitivity and responsiveness of measuring instruments using longitudinal design in efficacy studies to assess change in adolescents' psychosocial status over extended time.

Keywords

adolescence,
measurement,
psychosocial well-being,
school health, systematic
review

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Introduction

The last two decades have been marked by a substantial shift from health intervention to health promotion and prevention since the introduction of the concept of health as a continuum

from that of absence of disease to a state of well-being (Nakajima 1995). This dual-continuum model views mental health and mental illness as related but distinct constructs. Individuals who are free of a clinical diagnosis can still sever from psychosocial or physical well-being. This suggests that there is a need to

attend to individuals who are functioning poorly even in the absence of clinical disorders.

As such, a significant implication for the field of mental health promotion is that less optimal psychosocial well-being is as strong a predictor of adverse health outcomes as is mental illness itself. This shift in paradigm has changed the focus of health interventions from treating symptoms and deficits to identifying at-risk groups, with the goal of preventing the onset of mental illnesses (Druss *et al.* 2010). The resulting strong support for mental health promotion has brought about a transition from a clinically oriented system focused primarily on treating the sickness of non-well-being to an education-based model that keeps people well throughout their lives. This was seen by the increasing school-based health promotion and prevention initiatives that aimed at simultaneously promoting positive psychosocial well-being before the emergence of serious psychosocial problems in school adolescents (Ialongo *et al.* 2001; Lonczak *et al.* 2002; August *et al.* 2003), and the development of many newer assessment instruments for psychosocial well-being such as those reviewed in this article.

The majority of the traditional psychosocial outcome measures based on the medical clinically oriented approach categorically denoted according to the presence of clusters of symptoms. For instance, deficit-oriented indicators, such as use of inhalants and alcohol, lack of purpose in life, lack of sense of achievement particular in academic performance and disintegrating family structures such as overprotective parenting and increase in divorce rate, were used to classify suicide attempters and adolescents with depression (Byrne 2000; Li *et al.* 2010).

Although the documentation of deficits is essential for eligibility requirements of special services, current mental health education initiatives have encouraged the documentation of strengths and resources in children's mental health assessment, treatment and service delivery (Epstein 1999; Buckley & Epstein 2004). However, there has been a lack of evidence that strength-based assessment will lead to better outcomes for children (Nickerson 2007). As the construct of psychosocial well-being is multi-component, studies on measurement of intervention effectiveness can be arduous. As the need for effective measuring instruments for assessing health promotion and prevention interventions increases, it is essential to systematically investigate and the definitions for the construct, and the reliability and validity of assessment measures for psychosocial well-being. As such, the objectives of this study were: (1) to provide an overview of the current definitions for the construct of psychosocial well-being; (2) to systematically review the psychometric properties of the outcome measures used in assessing psychosocial well-being status of school children and adolescents; and (3) to

critically appraise the quality indicators of the measures and identify areas for improvement.

Methods

Selection criteria

A comprehensive literature search was conducted on electronic databases including Academic Search Premier, MEDLINE, PsycINFO, PROQUEST, Cumulative Index to Nursing and Allied Health Literature (CINAHL Plus) and Psychosocial and Health Instrument from their inception to 2009. The keywords used, including all MeSH headings, for the search were: child; AND emotion; AND assessment OR scale OR measure. A more general term of emotion is selected to cover psychosocial well-being, and child to cover adolescents. As such, more assessment instruments related to the assessment of psychosocial well-being of adolescents can be tracked.

The eligibility criteria for the selection of the publications to be reviewed were articles that: (1) reported the psychometric evaluation of a psychosocial well-being outcome measure; and (2) at least some of their participants included school-aged children or adolescents, their parents or teachers; (3) were peer-reviewed and excluding case studies, thesis, book chapters and manuals; and (4) were published in English. Outcome measures that focus on a specific diagnostic group only such as 'children with cleft palate' or 'children having Down's syndrome' were not included in this review.

Search procedures

All search outputs were independently examined by the first and second authors to determine eligibility for inclusion. The reviewers rated each article either positive (+) meaning 'adequately satisfies all the criteria', or negative (−) meaning 'does not adequately satisfy all of the criteria', or indeterminate (?) meaning 'information not sufficient to judge'. When disagreement occurred, the third author was consulted until a consensus was reached. Using the search keywords, the titles and abstracts were first screened to identify relevant articles. Full texts were obtained for those abstracts which were rated positive or indeterminate to enable further evaluation. The rating results guided the subsequent appraisal and assessment procedures.

Critical appraisal and assessment procedures

For the first objective regarding definitions for the construct of psychosocial well-being, we adopted a qualitative analysis

approach. First, we attempted to identify the most commonly used themes for measuring psychosocial well-being by classifying the domains of the measures. Then, from the study findings we synthesized the themes into few main themes. The results were used for discussing what the best operational definition of the overall construct of psychosocial well-being will be for assessing adolescents.

For the second objective regarding the investigation of psychometric properties of various instruments, adapted from the quality indicator scoring criteria for good measurement properties of psychosocial well-being assessment instruments (Andresen 2000; Both *et al.* 2007), we developed a set of quality criteria with indicators for full article review. The evaluation criteria included seven operationally defined indicators including (1) construct validity (i.e. convergent/divergent validity or concurrent validity); (2) contrast and/or predictive validity; (3) internal consistency and/or factor analysis; (4) reliability (i.e. retest or inter-rater reliability); (5) sensitivity; (6) responsiveness; and (7) respondent/administrative burden. The definitions of the psychometric attributes and the rating criteria of the quality indicators are displayed in Table 1. To facilitate scoring, each indicator is defined by three grade levels (from A to C): grade A indicates full presence of quality evidence; grade B indicates partial presence of quality evidence while grade C refers to the lack of data reported in the article.

Results

Data extraction

The search found 906 publications, including Medline ($n = 85$); Academic search premier ($n = 175$); CINAHL Plus ($n = 45$); PsycINFO ($n = 204$); Proquest ($n = 339$); and Health and Psychosocial instruments ($n = 58$). After excluding 426 duplicates, we reviewed the titles and abstracts for each of the 480 remaining publications. Of these 480 potentially relevant studies, 453 articles did not meet the inclusion criteria: this includes 52 studies using either pre-schoolers or adults as participants removed after abstract review and 34 after article review, and, 224 studies involving measuring instruments irrelevant to psychosocial well-being removed after initial abstract review and 143 articles deleted after article review (Fig. 1).

Consequently, 27 articles, all published after 1990, were extracted for full article review (Fig. 1). In addition, two more articles (Bourdon *et al.* 2005) were added from the reference list of one source article (Brown *et al.* 2006). Therefore, altogether

Table 1. The quality indicator scoring criteria for the 17 psychosocial well-being assessment instruments under review

Instrument	Definition of quality indicator	Grades and criteria of quality indicator		
		A	B	C
Construct validity (i.e. convergent/divergent/concurrent validity)	The extent measure scores relate to other measures concerning the concepts that are being measured	Correlation >0.70 or equivalent	Correlation <0.70 or equivalent	No information found on investigation
Internal consistency	The extent to which items in a (sub)scale are inter-correlated, indicative of measuring the same construct	Cronbach alpha between 0.70 and 0.95 or equivalent	Cronbach alpha <0.70 or >0.9 or equivalent	No information found on investigation
Reliability (i.e. retest and/or inter-rater)	The extent scores on repeated measures are close to each other, and/or, the extent to which the persons are distinguishable from each other when assessed by two different raters	ICC or weighted Kappa >0.70 or equivalent	ICC or weighted Kappa <0.70 or equivalent	No information found on investigation
Contrast validity or predictive validity	The extent measure scores discriminates between different populations; and the extent scores predict scores on other similar criterion measures	Yes, for typical and atypical population	Yes, but only on typical or atypical population	No information found on investigation
Sensitivity	The proportion of actual positives which are correctly identified by the instrument	Strong: AUC >0.70 or classical regression tree correct >0.7	Moderate: AUC <0.70 or classical regression tree correct <0.3	No information found on investigation
Responsiveness	The ability to detect change in outcomes over time or because of intervention using pre-specified criteria; a measure of predictive validity	Strong change: minimal change $<$ smallest detectable change	Moderate change: minimal change $>$ smallest detectable change	No information found on investigation
Respondent/administrator burden	The degree of acceptability by the respondents/administrators in terms of the time needed to complete the test, and the specified requirements that are placed on respondents/administrators	Highly acceptable (<20 min)	Moderately acceptable	Poorly acceptable

ICC, intraclass correlation coefficient; AUC, area under the curve.

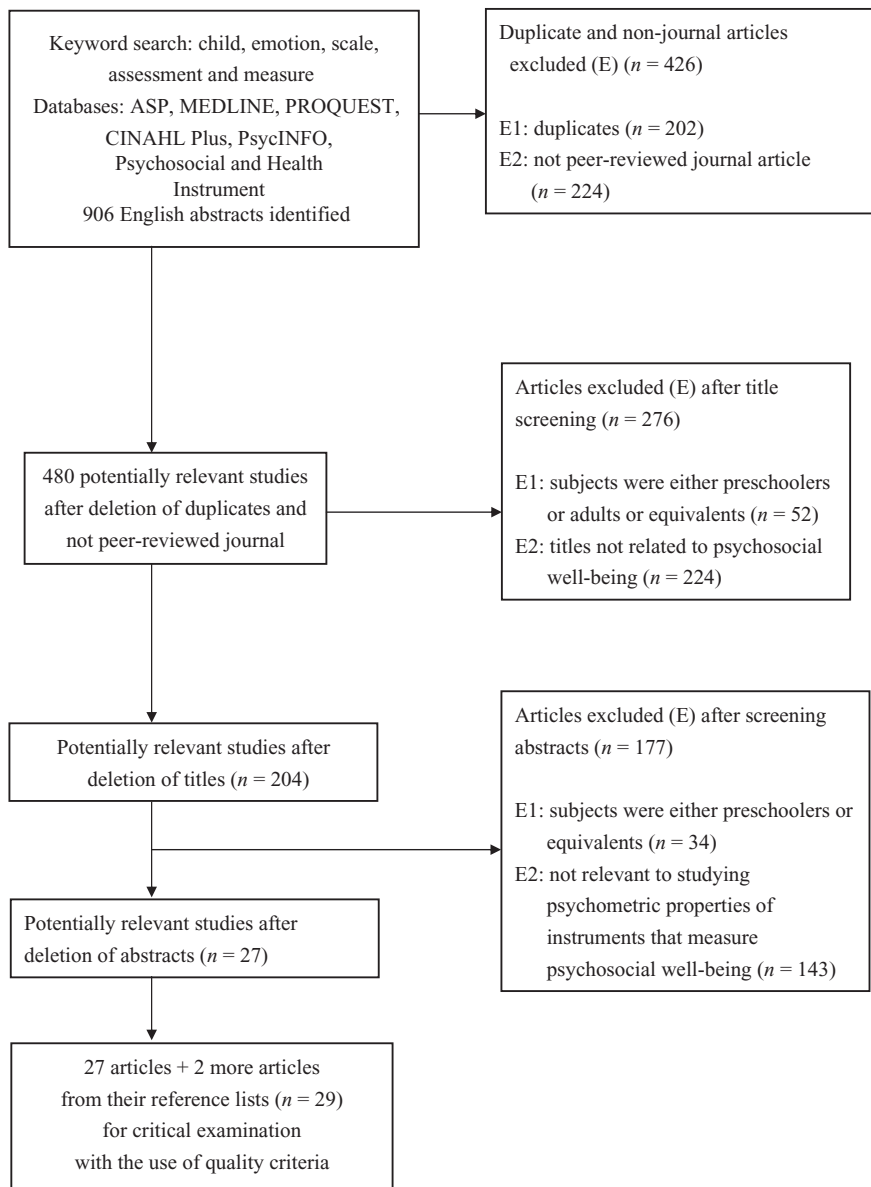


Figure 1. Flow chart showing the selection process of studies related to psychosocial well-being assessment measures.

29 articles were examined for the psychometric properties of a total of 17 measures of psychosocial well-being.

Construct building for psychosocial well-being

In the review, we found that the construct of psychosocial well-being is basically operationally defined in two divergent directions, positive strength-based and negative deficit-oriented approaches.

Table 2 lists out all the 17 instruments including their long names, abbreviations and sources of references. Deficit-oriented

indicators identified in the 17 measures (Table 2) include: poor emotional awareness (i.e. ESSC), negative affect (i.e. AFARS, PANAS-C, DLSS), negative intensity and reactivity (i.e. AIR-Y, SIS), inhibition/expressive reluctance/dysregulated expression (i.e. CSMS, ESSC), social anxiety and malevolent aggression (EBS 2004), conduct problems/behavioural dysregulation (i.e. SDQ, SIS), peer problems/conflict spillover representation (i.e. SDQ, SIS) and destructive family representations (i.e. SIS). Three emerging themes can be identified: (1) poor emotional awareness and expression; (2) negative affect and anxiety; and (3) poor interactions with peers and family.

Table 2. Emerging themes of constructs of psychosocial well-being from the 17 instruments

Instrument	Deficit-oriented constructs	Strength-based constructs	Emerging positive themes
AFARS (2000)	– Negative affect (NA) – Physiological hyperarousal (PH)	– Positive affect (PA)	Positive affect
AIR-Y (2009)	– Negative intensity (NI) – Negative reactivity (NR)	– Positive affectivity (PA)	Positive affect
BER-2 (2008)	Nil	– Interpersonal strength (IS) – Affective strength (AS) – Family involvement (FI) – School functioning (SF) – Intrapersonal strength (IP)	Interpersonal communication Personal adaptation
BOS (2005)	Nil	– Adaptive – Self-management – Communication – Interpersonal – Learning task – Personal dialogue	Personal adaptation
CPDS (2009)	– Child distress	– Resilience	Personal adaptation
CSMS (2001)	– Inhibition – Dysregulated expression	– Coping	Personal adaptation
DECA (2007)	– Social & emotional problems	– Initiative – Self-control – Attachment	Personal adaptation Emotional awareness and control
DESSA (2009)	Nil	– Strength – Self-management – Goal-directed behaviour – Self-awareness – Social awareness – Personal responsibility – Decision making – Relationship skills	Personal adaptation
DLSS (1993)	– Negative daily life events – Negative affectivity	Nil	
EBS (2004)	– Social anxiety (SA) – Malevolent aggression (MA)	– Social self-esteem (SS)	Personal adaptation
ESSC (2002)	– Poor emotional awareness – Expressive reluctance	Nil	Emotional awareness and control
LEAS-C (2005)	Nil	– Emotional awareness: (a) self-awareness (b) other awareness (c) total awareness – Emotional experiences: (a) bodily sensations (b) action tendencies (c) single emotions (d) blends of emotion (e) combinations	Emotional awareness and control
PANAS-C (1999)	– Negative affect (NA)	– Positive affect (PA)	Positive affect
Q-Scale (1997)	Nil	– Emotion regulation Q-Sort – Autonomy Q-Sort	Emotional awareness and control
R-Scales (2007)	Nil	– Sense of mastery (Resource Index and Vulnerability Index) – Sense of relatedness	Positive affect Interpersonal communication
SDQ (2005)	– Emotional symptoms – Conduct problems – Inattention hyperactivity – Peer problems	– Prosocial behaviour – Internalizing – Externalizing	Interpersonal communication
SIS (2002)	– Emotional reactivity (ER) – Behavioural dysregulation (BD) – Destructive family representations (DF) – Conflict spillover representations (CS) – Avoidance (AV)	– Involvement (IV) – Constructive family representations (CF)	Interpersonal communication

Abbreviations codes for instruments used for concurrent validity studies: ARI, Affect Regulation Interview; BASC-2, Behavior Assessment System for Children-2; CAAR, Children's Autonomic Arousal Report; CAMS, Children's Anger Management Scale; CBCL-TRF, Achenbach's Child Behaviour Checklist-Teacher-rated form; CCQ, California Child Q-set; CDI, Children's Depression Inventory; CPIC, Children's Perception of Interparental Conflict Scale; CPS, Conflict and Problem-Solving Scales; D-Scales, Devereux Scales of Mental Disorders; EAS, Emotion Awareness Scale; HDQ-A, Home Data Questionnaire – Adult version; JEPQ, Junior Eysenck Personality Questionnaire; PDS, Parental Description Scale; PHSCC, Piers-Harris Self-Concept Scale; PSWQ-C, Penn State Worry Questionnaire-Child version; RCMAS, Revised Children's Manifest Anxiety Scale; SSRS, Social Skills Rating Scale; STAIC, State-Trait Anxiety Inventory for Children; STRS, Student-Teacher Relationship Scale; WISC-III, Wechsler Intelligence Scale for Children-Version 3.

Four themes emerged through strength-based indicators constructed in the 17 measures are identified (Table 2) as follow: (1) positive affect (i.e. AFARS, AIR-Y, PANAS-C); (2) emotional awareness and regulation/control (i.e. BOS, DECA, DESSC, LEAS-C and Q-Scale); (3) interpersonal communication, as in attachment/social involvement/family involvement/constructive family representations/prosocial behaviour (i.e. BERS-2, BOS, DECCA, SDQ and SIS); and (4) personal adaptation, as in resilience/coping/personal responsibility/social self-esteem/sense of mastery/autonomy/initiative (i.e. CPDS, CSMS, DECA, DESSA, EBS, Q-Scale and R-Scale). The construct validity for psychosocial well-being assessment is generally confirmed by correlating the strength-based subscales of the new instrument with the subscales of those traditional deficit-oriented measures. Evidence for construct validity was basically drawn as long as the strength-based item scores inversely correlated with clinical problematic symptoms and positively correlated with other positive well-being indicators (Table 3).

Psychometric characteristics of measures

The rating results for each instrument across all quality indicators are presented in Table 4. For quality indicators scoring results, there is one outcome measure which was rated 5A (i.e. BERS-2); five were rated 4A (i.e. AFARS, AIR-Y, DESSA, SDQ and SIS); and four were rated 3A (i.e. CPDS, EBS, PANAS-C and Q-Scale) (Table 4). The psychometric properties of the instruments other than construct validities are summarized in Table 5, and those relating particularly to the measure design of the instruments are outlined in Table 6. Results of individual quality indicators are described as follows:

Construct and concurrent validities

Four measures were scored A (24%; i.e. BERS-2, CPDS, DESSA and SIS) as their scores demonstrated significant high correlation with scores of similar constructs (in convergent validity) and dissimilar constructs (in divergent validity) of other measures. For instances, DESSA's total protective factor scores were positively correlated with BERS-2's Strength index ($r = 0.80$, $P < 0.01$) (Nickerson & Fishman 2009). All the rest (76%; i.e. 13 of the 17 instruments) were scored B when their correlation with other measures is moderate (i.e. $r < 0.70$) (Table 4).

Internal consistency

All measures except two (i.e. BOS and DLSS) confirmed their content reliability by reporting the internal consistency of their

subscales. Nine of the 17 measures (53%) also confirmed the structural hypothesis of the subscales by conducting either exploratory factor analysis or confirmatory factor analysis (i.e. AIR-Y, BER-2, CPDS, DECA, EBS, ESSC, PANAS-C, R-Scales and SIS). For internal consistency, 11 out of 17 measures (65%) were scored 'A' (i.e. AFARS, AIR-Y, BERS-2, CPDS, DECA, DESSA, EBS, ESSC, PANAS-C, Q-Scale and SDQ). Their Cronbach alpha (α) scores between subscales ranged between 0.7 and 0.9 indicating that the subscales items are inter-related but not to an extent to supersede each other. Four (24%) were scored 'B' (i.e. CSMS, LEAS-C, R-Scales and SIS) indicating moderate relationship between subscales (Table 5).

Reliability testing

Thirteen measures (76%) conducted reliability testing mainly in a form of test-retest reliability and five (29%) also conducted inter-rater reliability (e.g. BERS-2, DECA, DESSA, LEAS-C and SDQ). However, only eight measures (47%; i.e. AFARS, Air-Y, BERS-2, DESSA, EBS, LEAS-C, Q-Scale and SIS) received grade A for reliability testing when their intraclass correlation is higher than 0.7 indicating strong stability over time or between persons on repeated measures (Table 5).

Sensitivity and responsiveness

However, none of the measures except two (12%; i.e. CSMS and Q-Scale) reported sensitivity results on clinical samples. Another three measures (18%; i.e. BOS, SDQ and SIS) evaluated predictive validity to investigate the extent their scores predict the target sample under investigation. No studies had investigated its responsiveness to intervention.

Measure design

In terms of design format regarding the item content and the response type, all measures except three, adopted the Likert rating scale design with response description using a first-person subjective perspective approach on non-specific conditions. Examples of items include: 'I try to calm down with what is making me feel mad.' (in CSMS); 'I often do not know why I am angry.' (in EESC); and 'My friends might say I'm emotional.' (in AIR-Y). The three exceptions included the BOS which adopted a structured criterion-referenced observation-based interview format based on a 5-point scaled response options of judgement from 'no basis for a judgement' (score 0) to 'almost always true' (score 4); the EBS that adopted a scenario condition-specific method to present the questions and the

Table 3. The construct properties of the 17 instruments under review

Instrument	Convergent validity (concurrent validity)	Divergent validity
1) AFARS	<ul style="list-style-type: none"> Negative affect (NA) moderately positively correlates with Physiological hyperarousal (PH); Negative affect (NA) correlates with Worry ($r = 0.63$ with PSWQ-C), Anxiety ($r = 0.44$ with RCMAS), depressed mood ($r = 0.40$ with CDI), with autonomic arousal ($r = 0.47$ with CAAR); Physiological hyperarousal (PH) correlates with RCMAS. 	<ul style="list-style-type: none"> Negative affect (NA) does not correlate with CDI's Conduct behaviours ($r = -0.01$; $P = 0.04$); Positive affect (PA) negatively correlates with CDI; Positive affect (PA) not related to RCMAS; Physiological hyperarousal (PH) does not correlate with CDI total scores; Positive affect (PA) was orthogonal with Negative affect (NA) & Physiological hyperarousal (PH).
2) AIR-Y	<ul style="list-style-type: none"> Negative intensity (NI) correlates positively to PANAS- Negative scores; Negative reactivity (NR) correlates positively to PANAS-Negative scores; Positive affectivity (PA) relates with mood ratings following laboratory-assessed positive mood induction. 	
3) BER-2	<p>PRS – Total scores positively correlated with SSRS's Social skills ($r = 0.65$ with Interpersonal strength (IS), $r = 0.74$ with Intrapersonal strength (IP), $r = 0.43$ with SF);</p> <p>TRS – correlated with CBCL-TRF: $r = -0.62$ with Interpersonal strength (IS), $r = -0.62$ with total problem scores, $r = -0.64$ with externalizing problems, $r = -0.64$ between Interpersonal strength (IS) and Rule-breaking, $r = -0.60$ between Interpersonal strength (IS) and Aggressive behaviour, $r > -0.70$ between Interpersonal strength (IS) and total scores, and $r = -0.76$ between Interpersonal strength (IS) and externalizing scores.</p>	<p>YRS – Total scores negatively correlated with CBCL-TRF's Problem scores ($r = -0.50$);</p> <p>PRS – Total scores negatively correlated with SSRS's Problem behaviour ($r = -0.74$ with Interpersonal strength (IS), $r = -0.79$ with Interpersonal strength (IS), $r = -0.46$ with Conflict spillover representations (CS); negatively correlated with CBCL's Problem ($r = -0.19$–-0.91) and CBCL's externalizing scale scores;</p> <p>Conflict spillover representations (CS) scores negatively correlates with CBCL's TRF Delinquent behaviour syndrome ($r = -0.75$) and with Somatic complaints ($r = -0.09$).</p>
4) BOS		<ul style="list-style-type: none"> significant inversely correlated the CBCL-TRF subscales including Withdrawn Social problems, Attention problems, Delinquent behaviour and Aggressive behaviour subscales, except subscales of Anxious/Depressed and Thought problems (Total scores: $r = -0.44$, $P < 0.05$; $r^2 = 0.2$)
5) CPDS	Not reported	Not reported
6) CSMS	<ul style="list-style-type: none"> significantly correlated with self-report of Sadness and Coping in CDI and STAIC; positively associated with Negativity/Lability; strongly correlated with maternal report of Dysregulated-expression of emotion; positively associated with CDI and STAIC. 	<ul style="list-style-type: none"> not related to Emotional regulation in CBCL; negatively correlated with peer rating of Aggression; Divergent – negatively correlated with EAS and STAIC; no significant correlation with CBCL; Emotional regulation is not associated with Inhibition in CBCL.
7) DECA	Two versions (Strength & Deficit) compared: Concern range t -scores $< \text{or} = 40/t = \text{or} > 60$; typical range t -scores 41 to 59 (Behavioural concerns scale)	Strength range t -scores = or > 60
8) DESSA	<p>Divergent – BASC-2 Behavioural symptom index and Externalizing problem subscales negatively correlated with DESSA Total protective factors;</p> <p>Convergent – DESSA Total protective factors correlated with BERS-2 Strengths index (SI) ($r = 0.80$, $P < 0.01$) for both parents and teachers.</p>	Correlation between PRS subscales DESSA & BERS-2 ranged from 0.41 to 0.77; with Achenbach's CBCL & Conners' PRS (moderate to high correlation)
9) DLSS	<p>Concurrent – Total scores positively correlated with CDI ($r = 0.72$, $P < 0.01$); with STAIC ($r = 0.60$, $P < 0.01$); but negatively with PHSCC ($r = -0.74$, $P < 0.01$);</p> <p>Regular-setting group scored significantly lower DLSS scores than the alternative-setting group.</p>	Divergent and convergent validity not reported
10) EBS	<p>(1) Social Anxiety (SA)</p> <p>(2) Malevolent aggression (MA)</p> <p>(3) Social self-esteem (SS)</p>	<p>Concurrent – Social Anxiety (SA) with Conduct problems ($r = -0.39$) and Hyperactivity ($r = -0.19$) against SDQ ($n = 145$); with Neuroticism ($r = 0.33$) against JEPQ-S ($n = 241$); with Empathy ($r = 0.72$) against Junior-16 ($n = 207$); with Prosocial ($r = 0.60$) against SDQ ($n = 145$)</p> <p>Concurrent – Malevolent aggression (MA) with Conduct problems ($r = 0.68$, $P < 0.01$) and with Hyperactivity ($r = 0.48$) against SDQ, with JEPQ-S's Neuroticism ($r = 0.26$) and Psychoticism ($r = 0.52$)</p> <p>Concurrent – Social self-esteem (SS) with Peer problems ($r = -0.56$, $P < 0.01$) against SDQ; with JEPQ-S's Neuroticism ($r = -0.54$) and SDQ's Peer problems ($r = -0.56$)</p>
11) ESSC	<p>(1) Poor emotional awareness</p> <p>(2) Expressive reluctance</p>	<p>Concurrent – Poor emotional awareness positively related to CSMS & CAMS Inhibition and Dysregulation scales and negatively related with Regulation coping scale; positively related with CDI and STAIC's Internalizing symptoms</p> <p>Concurrent – Expressive reluctance positively related with CDI and STAIC's internalizing symptoms; positively related with CSMS and CAMS's Dysregulated Expression; positively related to ARI's Decision to express</p>

Table 3. *Continued*

Instrument	Convergent validity (concurrent validity)	Divergent validity
12) LEAS-C	– No significant correlation with PDS; but correlated significantly with emotion comprehension and vocabulary of WISC-III	– inversely correlated with mood congruent bias, negative effect, and intense emotional experience
13) PANAS-C	– Negative Affect (NA) correlates positively with self-report measures of depression	– Positive Affect (PA) negatively correlated with CDI and modestly correlated with STAIC
14) Q-Scale	Concurrent – $r = 0.44, P < 0.001$ (Emotional regulation vs. Emotional observation); $r = -0.79, P < 0.001$ (Emotional regulation vs. Lability/Negativity); Concurrent – $r = -0.13, P < 0.05$ (Emotional regulation-Autonomy); Emotional regulation is also a stronger predictor of negative mood ($r = -0.49, P < 0.001$; $t = 6.99, P < 0.001$); Emotional observation ($r = 0.18, P < 0.01$; $t = 5.54, P < 0.01$) is more correlated than Resiliency ($r = 0.44, P < 0.001$).	
15) R-Scales	– positively related to levels of bullying.	– negatively correlated with levels of bullying
16) SDQ	SDQ's Total scores vs. CBCL's Total scores ($r = 0.70$); SDQ's Emotional symptoms vs. CBCL's Internalizing ($r = 0.70$); SDQ's Conduct problems vs. CBCL's Externalizing ($r = 0.60$); SDQ's Emotional symptoms vs. CBCL's Anxious-depressed ($r = 0.70$).	SDQ's Prosocial behaviour inversely correlated with CBCL's Externalizing ($r = -0.35$), Aggressive ($r = -0.34$) & Delinquent/withdrawn ($r = -0.28$)
17) SIS	When compared with CPIC, CPS, HDQ-A & CBCL, parental report total scores predicted children's Conflict reactivity across different informants – (moderate significant $r = 0.33$) (e.g. Emotional reactivity moderately correlated with parental report of Emotional distress); – r ranged from 0.19 to 0.44, $P < 0.05$ (Emotional reactivity (ER) with Child, Mother, and Father Reports of Destructive Interparental Conflict); – r ranged from 0.21 to 0.40, $P < 0.05$ (BD with Child, Mother, and Father Reports of Destructive Interparental Conflict); – $r = 0.24, P < 0.05$ [Avoidance (AV) with Child Reports of Destructive Interparental Conflict]; – r ranged from 0.17 to 0.18, $P < 0.05$ [Involvement (IV) with Mother and Father Reports of Destructive Interparental Conflict]; – r ranged from 0.23 to 0.39, $P < 0.05$ [Destructive family representations (DF) with Mother, and Father Reports of Destructive Interparental Conflict]; – r ranged from 0.21 to 0.45, $P < 0.05$ [Conflict spillover representations (CS) with Child, Mother, and Father Reports of Destructive Interparental Conflict].	– r ranged from -0.19 to $-0.53, P < 0.05$ [Constructive family representations (CF) with Child, Mother, and Father Reports of Destructive Interparental Conflict]

The titles of and the 29 source references for the 17 Instruments under review are listed as follows:

- 1) AFARS – Affect and Arousal Scale (#1: Chorpita *et al.* 2000; #2: Daleiden *et al.* 2000).
- 2) AIR-Y – Affect Intensity and Reactivity Scale for Youth (#3: Jones *et al.* 2009).
- 3) BERS-2 – Behavioral and Emotional Rating Scale (Version Two) (#4: Benner *et al.* 2008; #5: Buckley & Epstein 2004; #6: Friedman *et al.* 1999; #7: Harniss *et al.* 1999; #8: Epstein 1999; #9: Trout *et al.* 2003; #10: Furlong *et al.* 2007; #11: Gonzalez *et al.* 2006; #12: Mooney *et al.* 2005; #13: Synhorst *et al.* 2005).
- 4) BOS – Behavioral Objective Sequence (#14: Wilder *et al.* 2005).
- 5) CPDS – Child Psychosocial Distress Screener (#15: Jordans *et al.* 2009).
- 6) CSMS – Children's Sadness Management Scale (#16: Zeman *et al.* 2001).
- 7) DECA – Devereux Early Childhood Assessment (#17: Reddy 2007).
- 8) DESSA – Devereux Student Strengths Assessment (#18: Nickerson & Fishman 2009).
- 9) DLSS – Daily Life Stressors Scale (#19: Kearney *et al.* 1993).
- 10) EBS – Emotional Behavior Scale (#20: Clabour & Roger 2004).
- 11) EESC – Emotion Expression Scale for Children (#21: Penza-Clyve & Zeman 2002).
- 12) LEAS-C – Levels of Emotional Awareness Scale for Children (#22: Bajgar *et al.* 2005).
- 13) PANAS-C – Positive and Negative Affect Scale (#23: Laurent *et al.* 1999).
- 14) Q-Scale – Emotional Regulation Q-Scale (#24: Shields & Cicchetti 1997).
- 15) R-Scales – Resiliency Scales for Children and Adolescents (#25: Thorne & Kohut 2007).
- 16) SDQ – Strengths and Difficulties Questionnaire (#26: Brown *et al.* 2006; #27: Bourdon *et al.* 2005; #28: Muris *et al.* 2003).
- 17) SIS – Security in the Interparental Subsystem (#29: Davies *et al.* 2002).

participant was given a dichotomous choice of 'more like me' or 'less like me'; and the LEAS-C which used evocative interpersonal scenarios for performance-based assessment with questions like 'How would you feel?' (Table 6).

In terms of respondent type, only the R-Scales was hand-scored by examiner while nine were self-reported (i.e. 53%;

AIR-Y, CSMS, DLSS, EBS, EESC, LEAS-C, PANAS-C, Q-Scale and SIS) and seven (i.e. 41%; AFARS, BERS-2, BOS, CPDS, DECA, DESSA and SDQ) adopted the multi-informant approach (Table 6). Among them, only three (i.e. 18%; BERS-2, DESSA and SDQ) conducted cross-informant validity investigation yielding low to moderate correlation (i.e. BERS:

Table 4. The quality indicator scoring results for the 17 psychosocial well-being assessment instruments under review

Instrument	Construct validity	Internal consistency	Reliability	Contrast/predictive validity	Sensitivity	Responsiveness	Respondent/administrator burden
1) AFARS	B	A	A	A	C	C	A
2) AIR-Y	B	A	A	A	C	C	A
3) BERS-2	A	A	A	A	C	C	A
4) BOS	B	C	C	A	C	C	B
5) CPDS	A	A	C	B	B	C	A
6) CSMS	B	B	B	B	C	C	A
7) DECA	B	A	A	C	C	C	A
8) DESSA	A	A	B	C	C	C	A
9) DLSS	B	C	B	A	C	B	A
10) EBS	B	A	A	C	C	C	A
11) ESSC	B	A	B	B	C	C	A
12) LEAS-C	B	B	A	B	C	C	A
13) PANAS-C	B	A	C	A	C	C	A
14) Q-Scale	B	A	A	A	C	C	B
15) R-Scales	B	B	C	A	C	C	A
16) SDQ	B	A	B	A	A	C	A
17) SIS	A	B	A	A	C	C	A

The titles of and the 29 source references for the 17 Instruments under review are listed as follows:

- 1) AFARS – Affect and Arousal Scale (#1: Chorpita *et al.* 2000; #2: Daleiden *et al.* 2000).
- 2) AIR-Y – Affect Intensity and Reactivity Scale for Youth (#3: Jones *et al.* 2009).
- 3) BERS-2 – Behavioral and Emotional Rating Scale (Version Two) (#4: Benner *et al.* 2008; #5: Buckley & Epstein 2004; #6: Friedman *et al.* 1999; #7: Hamiss *et al.* 1999; #8: Epstein 1999; #9: Trout *et al.* 2003; #10: Furlong *et al.* 2007; #11: Gonzalez *et al.* 2006; #12: Mooney *et al.* 2005; #13: Synhorst *et al.* 2005).
- 4) BOS – Behavioral Objective Sequence (#14: Wilder *et al.* 2005).
- 5) CPDS – Child Psychosocial Distress Screener (#15: Jordans *et al.* 2009).
- 6) CSMS – Children's Sadness Management Scale (#16: Zeman *et al.* 2001).
- 7) DECA – Devereux Early Childhood Assessment (#17: Reddy 2007).
- 8) DESSA – Devereux Student Strengths Assessment (#18: Nickerson & Fishman 2009).
- 9) DLSS – Daily Life Stressors Scale (#19: Kearney *et al.* 1993).
- 10) EBS – Emotional Behavior Scale (#20: Clabour & Roger 2004).
- 11) ESSC – Emotion Expression Scale for Children (#21: Penza-Clyve & Zeman 2002).
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- 15) R-Scales – Resiliency Scales for Children and Adolescents (#25: Thorne & Kohut 2007).
- 16) SDQ – Strengths and Difficulties Questionnaire (#26: Brown *et al.* 2006; #27: Bourdon *et al.* 2005; #28: Muris *et al.* 2003).
- 17) SIS – Security in the Interparental Subsystem (#29: Davies *et al.* 2002).

Table 5. Other psychometric properties of the 17 instruments under review

Instrument	Internal consistency (α)/factor analysis	Samples types and contrast/predictive validity	Reliabilities – retest/inter-rater/cross-informant agreement
1) AFARS	α = (PA) 0.77/(NA) 0.80/(PH) 0.81 (Chorpita <i>et al.</i> 2000); α = (PA) 0.66/(NA) 0.74/(PH) 0.78 (Daleiden <i>et al.</i> 2000).	Aged 7–17 years; Multi-ethnic, normative sample (n = 1289); Contrast – no significant difference between groups in sex, ethnic and grade levels.	Retest (1-week) = 0.68/0.68/0.72 for all age groups; 0.64/0.52/0.77 for aged 7–10 group; 0.70/0.75/0.70 for aged 11–18 (P < 0.001).
2) AIR-Y	Confirmatory factor analysis – 3-factors (chi-square = 706.080; d.f. = 321, P = 0.00; CFI = 0.94, 90% CI RSMEA 0.069–0.084, RSMEA = 0.07); α = (NI) 0.70/(NR) 0.73/(PA) 0.90.	Aged 10–17 years; Clinical and the community samples.	Retest (2-week) = 0.75/0.82/0.53, all at P < 0.001.
3) BER-2	Confirmatory factor analysis – 5-factors (YRS: CFI = 0.995; TLI = 0.979; NFI = 0.993; RMSEA = 0.12; TRS: CFI = 0.993; TLI = 0.986; NFI = 0.995; RMSEA = 0.148). (YRS): Interpersonal strength (IS) (α = 0.82), Family involvement (FI) (α = 0.80), School Functioning (SF) (α = 0.88), IP (α = 0.82), AS (α = 0.80), Strengths index (SI) (α = 0.95). (PRS): α > 0.80 (overall), α = 0.80 Conflict spillover representations (CS) to α = 0.94 Family involvement (FI) for elementary school samples. (TRS): α from 0.84 to 0.92 (Epstein <i>et al.</i> 2004); α from 0.81 to 0.89 with α = 0.98 for Strengths index (SI).	Aged 7–16 years; (YRS): Aged 11–18 years; (PRS): Aged 5–18 years; (TRS): Aged 5–18. Multi-ethnic normative samples (n = 2176) and 861 children with EBD; Contrast – Significant lower scores and moderate effect size difference between norm and emotional disturbed samples reported in manual; r = 0.82 to 0.92.	(YRS): Retest (2-week): Interpersonal strength (IS) (r = 0.89), Family involvement (FI) (r = 0.85), School Functioning (SF) (r = 0.89), IP (r = 0.91), Affective strength (AS) (r = 0.84), SF (r = 0.89), Overall SI (r = 0.91). (PRS): Retest (2-week) = 0.85–0.99, Retest (6-week) = 0.84–0.98 & Retest (6-month) = 0.53–0.78; Cross-informant agreement (parent & youth) r = 0.20–0.67; (TRS): Retest (2-week) r = 0.85 to 0.99; Inter-rater r = 0.83–0.98; Cross-informant agreement (parent & teacher) r = 0.50–0.63.
4) BOS	Cronbach's α not reported.	Youth with EBD (n = 63); teachers (n = 18); counselling intern (n = 10). Aged 11–18, Caucasian (70%), African-American (10%), and Biracial (8%). Contrast – Mean scores for students in institutional settings are significantly lower than those in school settings.	
5) CPDS	Confirmatory factor analysis – 3-factor structure across three cross-cultural samples. Burundian sample: (chi-square = 7.80; P = 0.65; NNFI = 0.99; RSMEA < 0.01); Indonesian sample: (chi-square = 10.06; P = 0.44; NNFI = 0.99; RSMEA < 0.00); Sri Lankan sample: (chi-square = 13.18; P = 0.15; NNFI = 0.99; SMEA < 0.05).	Aged 8–12 years; tested on Burundian, Indonesian Sri Lankan and Sudanese samples.	
6) CSMS	α = (Inhibition) 0.77/(Coping) 0.62/ (Dysregulated) 0.60.	(n = 227); 4th to 5th grades, normed for aged 9–12 years, but used successfully from aged 6–14 years.	Retest (2-week) (Inhibition) = 0.80; (Coping) r = 0.63; (Dysregulated) r = 0.63; all significant at P < 0.01.
7) DECA	Each scaled score is divided into 3 ranges (in t scores): concern, typical & strength. Factor analysis – factor loading of 0.34 (10% variance) reported on the protective factors scales. α = 0.91/0.94 (parent); 0.80/0.80 (teacher); α = 0.78 (Emotional control problems) to 0.66 on Withdrawal/Depression; α = 0.90 (Attention problems) to 0.80 (Withdrawal/Depression).	Separate norms are not available for different gender.	Retest (4-week) = 0.55 to 0.80 for parents; 0.68 to 0.91 for teachers; Inter-rater (parent-to-parent) = 0.21 (Protective) to 0.44 (Behavioural concerns); Inter-rater (teacher-to-teacher) = 0.44 (Total protective) to 0.77 (Self-control); teacher-to-parent = 0.19 (Attachment) to 0.34 (Initiative).

Table 5. Continued

Instrument	Internal consistency (α)/factor analysis	Samples types and contrast/predictive validity	Reliabilities – retest/inter-rater/cross-informant agreement
8) DESSA	$\alpha = 0.87$ to 0.93 .	94 teachers & 133 parents.	Retest (1-week) = 0.94 (teachers); 0.90 (parents), 0.79 (Social awareness) to 0.90 (Relationship skills) for parents; 0.86 (Self-awareness) to 0.94 (Responsibility judgement) for teachers. Cross-informant validity: teacher mean higher than parent mean on EP; not on IP $t(46) = 1.85$, $P = 0.07$.
9) DLSS	Not reported.	Aged 7–17; Regular-setting group ($n = 567$; in classroom settings); Alternative-setting group ($n = 145$; administrative restrictions); Foster-care group ($n = 80$; due to parental abandonment and abuse).	Retest (1-week) = 0.74 , $P < 0.01$
10) EBS	Factor analysis – 3 factors. $\alpha =$ Social Anxiety (SA) 0.84 /Malevolent aggression (MA) 0.83 /Social self-esteem (SS) 0.79 ; SA was orthogonal with MA ($r = -0.05$), SS negatively correlated SA ($r = -0.28$) & MA ($r = -0.37$).	Aged 11–14.	Retest (11-week) = (SA) 0.76 /(MA) 0.73 /(SS) 0.79 for year 7 students; $P < 0.01$.
11) ESSC	Principal components analyses – 2-factors (46.4% variance explained). $\alpha = 0.83/0.81$.	Aged 9–12; $n = 208$; European-American peer-rated. No sex difference; not related to social functioning measure of peer-reported Withdrawn nor Aggressive behaviour. Boys more aggressive than girls but not on Withdrawn scale.	Retest $r = 0.59/0.56$.
12) LEAS-C	(Self-score): $\alpha = 0.71$; (Other-score): $\alpha = 0.64$; (Total-score): $\alpha = 0.66$.	Contrast – female higher scores than males. Pilot study ($n = 6$; ages 9–12); Validity study ($n = 51$; ages 10–11).	Inter-rater: (Self-score) $r = 0.93$; (Other-score) $r = 0.86$; (Total-score) $r = 0.89$.
13) PANAS-C	Principal-axis factoring – 2-factors $\alpha = 0.94$ and 0.92 for NA scale development and replication; 0.90 and 0.89 for PA replication samples; compared with 0.87 for both NA & PA.	Grades 4–8 (mean age = 11.67 , SD 1.48) general school samples and unselected inpatient 8–16 years; scale development sample ($n = 349$); replication sample ($n = 358$). NA has higher scores for the inpatient samples; PA plays a role in differentiating anxiety and depression but not in externalizing disorders; the school sample had a higher mean score on PA than the unselected inpatient sample.	
14) Q-Scale	$\alpha = 0.85/0.79$.	143 maltreated and 80 impoverished children, no normative samples; Discriminant: Group differences between Well-regulated versus Dysregulated children – Liability/Negativity scale – $t(76) = 18.19$, $P < 0.001$; Regulation $t(69) = -12.66$, $P < 0.001$; Regulation observation $t(68) = 6.63$, $P < 0.001$; and Composite $t = 17.62$, $P < 0.001$). Developmental Difference – no significant difference between age groups older versus younger children.	Retest (12 days): $r(\text{Fisher's } z) = 0.84/0.88/0.90$ (for children); $r(8 \text{ days}) = 0.86/0.86/0.77$ (for adolescents). Reported appropriate sensitivity in differentiating clinical samples.

Table 5. *Continued*

Instrument	Internal consistency (α)/factor analysis	Samples types and contrast/predictive validity	Reliabilities – retest/inter-rater/cross-informant agreement
15) R-Scales	Confirmatory factor analysis – 3-factors; MAS negatively correlated with levels of bullying; $\alpha = 0.85/0.89/0.90$.	Aged 9–18; normal and clinical samples.	
16) SDQ	5 factors found; Total Difficulties: ($\alpha = 0.83$); Impairment scale: ($\alpha = 0.80$); subscales range: ($0.63 < \alpha < 0.77$); except Peer problem ($\alpha = 0.46$).	Aged 5–10 years; teacher-rated ($n = 227$) and parent-rated ($n = 253$) based on US norm; $n = 562$ Dutch children. Predictive – high Total difficulties method identified 9% of the sample and 45% of service use; 7% and 59% by parent-defined high difficulties method; and 7% and 56% by the high scale plus impairment method.	Low inter-rater agreement (Pearson's $r = 0.39$); best agreement for Attention and Conduct ($k = 0.42/0.35$), whereas worst agreement for Emotional problems & Prosocial behaviour ($k = 0.25/0.18$). Retest ICC > 0.70 for all scales except Prosocial. (ICC = 0.59). Cross-informant correlation between parents and self – 0.23 to 0.46; parents & teachers identified a similar proportion of children having high symptoms (25% vs. 23%) and high impairment (27% vs. 32%) but disagreed on the assessment criteria. Parents missed 52% rated by teachers ($k = 0.15$) as disturbed students.
17) SIS	Exploratory & Confirmatory factor analyses supported the 7-factor model (chi-square = 1944.16, $P < 0.001$, RMSEA = 0.058, CFI = 0.86, TLI = 0.84). (1) Overt distress – Emotional arousal & dysregulation ($\alpha = 0.78$ and 0.64); (2) Behavioural dysregulation (0.64 & 0.65); (3) Behavioural involvement: intervention in argument ($\alpha = 0.69$ and 0.70).	($n = 924$); 7–8 graders; Non-Hispanic European American (82%), African American (9%), Hispanic (5%), Asian or Native American (4%). Contrast – Gender differences in predictive validity testing. SIS subscales predicted child's Adjustment and child's Internalizing symptoms ($r = 0.29$) than Externalizing symptoms ($r = 0.22$). SIS destructive family representations subscale predicted children's negative appraisals of interparental relationships in the simulated parental conflicts; the emotional reactivity subscale most strongly predicted child's Distress; but the relations among SIS subscale were generally weak $r = 0.15$; predictive validity 6 months later ($r = 0.56$).	Retest (2-week) > 0.70 for all subscales except Behavioural dysregulation.

Abbreviations codes for instruments used for concurrent validity studies: ARI, Affect Regulation Interview; BASC-2, Behavior Assessment System for Children-2; CAAR, Children's Autonomic Arousal Report; CAMS, Children's Anger Management Scale; CBCL-TRF, Achenbach's Child Behaviour Checklist-Teacher-rated form; CCQ, California Child Q-set; CDI, Children's Depression Inventory; CPIC, Children's Perception of Interparental Conflict Scale; CPS, Conflict and Problem-Solving Scales; D-Scales, Devereux Scales of Mental Disorders; EAS, Emotion Awareness Scale; HDQ-A, Home Data Questionnaire-Adult version; JEPQ, Junior Eysenck Personality Questionnaire; PDS, Parental Description Scale; PHSCC, Piers-Harris Self-Concept Scale; PSWQ-C, Penn State Worry Questionnaire-Child version; RCMAS, Revised Children's Manifest Anxiety Scale; SSRS, Social Skills Rating Scale; STAIC, State-Trait Anxiety Inventory for Children; STRS, Student-Teacher Relationship Scale; WISC-III, Wechsler Intelligence Scale for Children-Version 3.

$r = 0.20$ – 0.67 between parent and youth reports; $r = 0.50$ – 0.63 between parent and teacher reports) (Table 5). In terms of respondent/administrative burden, all measures except two received grade 'A' indicating that they are generally user-friendly for untrained persons and can be administered within workable time frame of about 15 min. As the BOS needed 3-h observational rating time and the Q-Scale had a lengthy content of 100 items, they were scored 'B' (Table 6).

Contrast validity

For sample selection, all measures stated clearly and precisely the inclusion and exclusion criteria. Out of the 17 reviewed measures, nine measures (53%) contrasted scores of the clinical samples against those of the community samples (i.e. AIR-Y, BER-2, BOS, DLSS, PANAS-C, Q-Scale, R-Scales, SDQ and SIS) (Table 5).

Table 6. The administrative characteristics of the 17 instruments under review

Instrument	Respondent/administrative burden	Measure design (ratings/examples of items)
1) AFARS	self-report (30–40 min); parent-report (15–20 min); 27 items.	4-point (0–3): ‘never’ to ‘always true’; (e.g.) (PH) items: ‘I have trouble getting my breath.’ ‘My heart beats too fast.’ ‘My mouth gets dry.’
2) AIR-Y	self-report; 27 items.	6-point (1–6): ‘never’ to ‘always’; (e.g.) ‘Sad movies deeply touch me.’ or ‘My friends might say I’m emotional.’
3) BER-2	(YRS) 57 items (10 min); (PRF & TRF) 65 items (10–15 min).	4-point (0–3); (e.g.) ‘not at all like the child’ to ‘very much like the child’; with ‘not applicable’ and ‘don’t know’ options.
4) BOS	criterion-referenced, structured observation and/or ratings of multiple sources; 233 social competency items; 3-h time in participation.	5-point (0–4): 0 (no basis for a judgement, don’t know or does not apply); 1 (never or rarely – <30% time or opportunities); 2 (sometimes true – 30%–60%); 3 (often true – 60–90%); 4 (almost always true – 90%); (e.g.) ‘remember daily schedule without reminders’; ‘approach another student with a verbal or physical gesture of friendship’.
5) CPDS	child-report and teacher-report; 7 items.	3-point (0–2): (0): ‘not at all’; (1) ‘a little’; (2) ‘a lot’. (e.g.) TRS: ‘Have you been distressed by these events (for child)?’ ‘Have you observed any problems or worrisome behaviours in this child?’.
6) CSMS	self-report; 12 items.	3-point: (1): ‘hardly ever’; (2) ‘sometimes’; (3) ‘often’. (e.g.) ‘I hold my sadness in’; ‘I whine and fuss about what’s making me feel sad’; ‘I try to calmly down with what is making me feel mad’.
7) DECA	parent/teachers report; (DECA) 37 items/(DECA-C) 62 items.	5-point: ‘never’ to ‘very frequently’; for additional items, 4-point (1–4): ‘rarely’ to ‘very frequently’; scores interpreted by professionals on raw scores, standard scores, and percentile scores. (e.g.) All items start with ‘During the past 4 weeks, how often did the child . . .’ and then followed by a question about an observed behaviour, such as ‘hurt or abuse animals’; ‘set or threaten to set a fire?’
8) DESSA	self-report/parent/teachers report; 72 items.	5-point (0–4): ‘never’ to ‘very frequently’. (e.g.) ‘For the past 4 weeks, how often does . . .’ with behavioural descriptors regarding strength, such as ‘try to do his or her best?’; ‘respect another person’s opinion?’
9) DLSS	self-report; 30 items.	5-point (0–4): from (0) ‘not at all stressful’; (1) ‘a little stressful’; (2) ‘some stressful’; (3) ‘a lot stressful’; and (4) ‘very much stressful’. (e.g.) ‘It is hard for me to get up in the morning.’ ‘I feel uncomfortable at lunchtime.’
10) EBS	self-report; 24 items.	12 situations in printed scenario descriptions; dichotomized choices of ‘more like me’ or ‘less like me’ with spaces for written responses. (e.g.) ‘I never feel upset for long.’ ‘I am cheeky.’
11) EESC	self-report; 16 items.	5-point: from (1) ‘not at all true’; (2) ‘a little true’; (3) ‘somewhat true’; (4) ‘very true’; (5) ‘extremely true’. (e.g.) ‘I often do not know why I am angry.’ ‘I prefer to keep my feelings to myself.’
12) LEAS-C	self-report; performance-based assessment; 12 evocative interpersonal scenarios (20 min).	5 levels scoring: (0) no responses; (1) bodily sensations; (2) generalized response; (3) unidimensional emotion; (4) differentiated emotions; (5) complex blends of emotions. (e.g.) ‘How would you (the other person) feel?’
13) PANAS-C	self-report; 27 items.	5-point (1–5): ‘very slightly’ or ‘not at all’ to ‘extremely’. (e.g.) ‘Excited’ ‘Strong’ ‘Sad’.
14) Q-Scale	100 items; self-rated	9-point (1–9): ranging from ‘extremely characteristic’ to ‘extremely uncharacteristic’ (e.g.) ‘Can recover from stress’; ‘Is easily irritated’.
15) R-Scales	hand-scored by examiner; 64 items (15 min).	5-point (0–4): from ‘never’ to ‘almost always’; all raw scores can be converted into <i>t</i> -scores for standardized comparison and interpretation. Examples not reported.
16) SDQ	parallel versions for adolescents self-report/ parent/teachers report; 25 items; Total difficulties score: 5 items in 5 subscales.	3-point (0–2): from score = 0, ‘not at all’; 1 = ‘somewhat true’, to 2 = ‘certainly true’; For Total difficulties score ranged 0–40 excluding the reversely scored prosocial scale items; For Symptom score: 5 items have 3-point (0–2); from score = 0, ‘not at all’; 1 = ‘a medium amount’; to 2 = ‘a great deal’; 5 items in the scale score ranged 0–10. (e.g.) ‘Overall, do you think that your child has difficulties in one or more of the following . . .’
17) SIS	self-report; 37 items.	4-point (1–4): from ‘not at all true of me’ to ‘very true of me’. (e.g.) ‘I often see my parents arguing.’ ‘I distract them by bringing up other things.’ ‘How much would you worry about your family’s future?’

Discussion

Limitations of the deficit-oriented construct of psychosocial well-being

The deficit-oriented approach involves the use of rationally selected items from measures of clinical diagnoses or problematic symptoms such as anxiety and depression that predate current conceptual models of psychosocial well-being (Chorpita *et al.* 2000). When the scores for these clinical symptoms are low, a higher status of psychosocial well-being for the person being assessed is predicted.

This kind of approach has inherited us with a wealth of convergent and divergent validity data on concurrent validity studies for psychosocial well-being assessment that have deepened our understanding about the impact of psychosocial problems on students' behaviours. As for example, in contrary to what previous research had generally defined negative emotion into anger, depression, upset and worry, the study by Chorpita and colleagues (2000) had found that negative affect demonstrated better discriminant validity when it was confined to high sensitivity to negative stimuli and increased tendency to get upset than to worrying and depressed mood. Similarly, study by Daleiden and colleagues (2000) demonstrated that positive affect was more negatively related to depression while physiological hyperarousal was more positively related with anxiety. Their study also found that negative affect is highly related with emotional oversensitivity, a synonym with distress proneness or irritability more than with misconduct. These findings point to the importance of emotional regulation. Dysregulated emotions in either direction such as over- or under-sensitivity are contra-indicators for well-being.

The deficit-oriented approach has alerted us with all the possible risk factors that serve as obstacles to the attainment of students' psychosocial well-being. However, it has not informed us much of what really attributes to and impacts on the development of psychosocial well-being. Realizing the limitation brought forth by the traditional deficit-oriented outcome approach, contemporary measures that address the different components of protective factors for assessing psychosocial well-being from the strength-based approach have emerged in response to the need (Rutter 2005).

There are many advantages of using contemporary strength-based measures over the adoption of the traditional deficit-oriented measures (McConaughy & Ritter 2002) because child strengths are increasingly seen as an important component of clinical decision making (Oswald *et al.* 2001). It

specifies student competencies making students more motivated to seek intervention (Cox 2006). Information gained from the assessment can directly be used for individualized education programmes and curriculum planning. The items of strength-based rating scales can be directly translated from assessment into goals or objectives for prosocial skill development. It delineates yet-to-be-mastered prosocial behaviours that require instruction and differential reinforcement (Wilder *et al.* 2005).

Contributions of the strength-based constructs of psychosocial well-being

The emerging themes out of the 17 strength-based measures distinguish the constructs of psychosocial well-being primarily into two main dimensions: the personal emotional competency and social functioning dimensions. The emphasis on the communicative functioning of emotions has added in a newer dimension from the contextual behavioural perspective of social connectedness for the construct of psychosocial well-being. This moves the construct of psychosocial well-being beyond the individual characteristics to social contexts (Jimereson *et al.* 2004).

This contextual paradigm adds in an ecological orientation and shifts the focus of contemporary research on psychosocial well-being from personal characteristics to its interaction with the environment, those of family, school and community from a model of person–environment fit (Kristof 1996). As for example, measures such as the SIS began to explore the mediatory role of emotional security in linking interparental conflict and child functioning. Emotional security was not only represented in the subscales of 'Emotional reactivity' and 'Behavioural dysregulation', but also in 'Family representations' and 'Conflict spillover'. Examples of items are: 'I often see my parents arguing' and 'I distract them by bringing up other things' (Table 5). Under this social emotional competency model, strength-based assessment measures psychosocial well-being by the emotional-social behaviours that create a sense of accomplishment within self; enhance the ability to cope with stress; contribute to satisfying relationships with family members; and promote social and academic development (Bar-On 2006).

Impact of adopting the strength-based constructs for assessing psychosocial well-being

How we conceptualize and define psychosocial well-being has a direct impact on which strategy and interventional approach

we adopt. The branching out of psychosocial well-being into the dimensions of personal emotional competency and social functioning adds in a contextual behavioural perspective which lends itself naturally to the development of supportive resources in different social contexts for primary prevention and promotion of psychosocial well-being. Naturally, intervention will tap into the school context, such as relationships with teachers, ease of making friends and experience with playmates, coping with bullying and not feeling safe at school; the home context such as communication with parents, dealing with family conflicts and crises; and the community context such as interaction with web-friends and involvement in community activities. Personal emotional competency status relating to self-confidence, self-responsibility, self-efficacy and autonomy will be assessed and eventually dealt with from the home, school and community contexts, rather than from an intrapersonal context.

Moreover, the ecological system of support for students (Kriechman *et al.* 2010) includes not only those traditional participants such as parents, educators and healthcare providers but also peers, community pals and others identified by the student as critical to his or her psychosocial well-being. Consequently, promotion efforts will need to be multidisciplinary. As a result, schools are increasingly seen as essential places to implement intervention and educational programmes for psychosocial well-being, such as school-based anti-bullying campaigns and suicide prevention programmes.

On the other hand, the social emotional contextual paradigm makes the perspectives from those of the caregivers, the client and teacher, essential in assessing the status of psychosocial well-being. More and more authors of assessment measures have, therefore, adopted a multiple informant design. However, correlations between cross-informants were generally low. This can be attributed to the different roles, personal characteristics and knowledge of the person's behaviour by the informants, as well as the different contexts they are confined in observing the behaviour. Such discrepancies may simply reflect that the opportunities to observe students vary across contexts. Despite the low correlation, multiple-informant design is still recommended as the data from multiple sources augment one another to help make assessment of individuals more comprehensive than when all data come from one single informant (Goodman *et al.* 2000a,b; Achenbach *et al.* 2005). For example, study on the SDQ has found that combining parent and teacher reports detected 62% of psychiatric disorders among children aged 5 to 10, as compared with 30% for parent report alone (Brown *et al.* 2006). Such findings reflect that screening using parent reports alone was likely to under-

identify symptoms and functional problems that would be identified if reports were also solicited from teachers. It should be stressed that teachers' reports help improve the validity of the psychosocial well-being assessment measures and, therefore, the role of teachers in assessing psychosocial well-being of students is irreplaceable.

Limitations of this study

We have used a general terminology of 'emotion' and 'child' in our attempt to investigate the measures assessing psychosocial well-being of adolescents. This was decided under the assumption that the keyword 'child' should include an age span of infant, child and adolescents; and 'emotion' should cover psychological well-being, social and emotional well-being. However, this less specific approach to the choice of keywords for this systematic review might lead to the exclusion of some relevant instruments which potentially should be included in the study. Moreover, the choice of the aforementioned keywords had virtually led to the inclusion of all the psychosocial instruments with their items or subscales that assess children's deficits as well as strengths. In addition, because there has been an increasing trend of developing strength-based psychosocial measures, more and more instruments of that nature have been developed since 2009 and were not included in this review. Future systematic reviews on specifically strength-based measurements might shed more lights into the findings of using these measurements for assessing psychosocial well-being for adolescents.

Conclusion

The review shows that deficit-oriented outcome measures are mainly for diagnostic purposes and assess whether a student has or has not manifested a certain behaviour or personal characteristics. Strength-based measures focusing on social emotional behavioural outcomes have opened up a possibility to link up assessment with intervention on well-being promotion. Past research in psychosocial well-being assessment focused on construct validity studies and investigation on psychometric properties, and much less on clinical utility studies such as sensitivity and specificity. There is also little evidence available on the responsiveness of the outcome measures which is a form of longitudinal validity defined by its ability to detect clinically important changes over time. As increasingly policy makers and researchers are expanding the provision of school-based mental health services and asserting the intertwining roles of mental health and educational outcomes in supporting the overall

psychosocial well-being of adolescents, future intervention programme studies should place more focus on investigating the sensitivity and responsiveness of measuring instruments for psychosocial well-being by conducting more longitudinal design studies and efficacy studies to assess change in adolescents' psychosocial status over an extended period of time (Kataoka *et al.* 2009).

Key messages

- Psychosocial well-being is a strong indicator of mental health. Less optimal psychosocial well-being is as strong a predictor of adverse health outcomes as is mental illness itself; therefore, valid and reliable assessment instruments for psychosocial well-being is very important.
- An educationally strength-based approach is more preferable to a clinically deficit-oriented model in measuring adolescents' psychosocial well-being.
- In construct analysis, the themes identified from a systematic review of the strength-based instruments distinguished the construct of psychosocial well-being primarily into the dimensions of personal emotional competency and social functioning.
- Strength-based measures focusing on social emotional behavioural outcomes have opened up a possibility to link up assessment with health promotion and prevention interventions for children and adolescents in school contexts.
- This systematic review found that past research in psychosocial well-being assessment focused on construct validity studies and investigation on psychometric properties, and much less on clinical utility studies such as sensitivity and specificity. Future research should focus more on investigating the sensitivity and responsiveness of measuring instruments to assess change in adolescents' psychosocial status over extended time.

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