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The Development and First Use of the QUEST Measures to Evaluate School Nurses' Knowledge and Skills for Depression Recognition and Management.

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Abstract
Background
Depression affects around 5% of adolescents and its identification and management is an important part of front-line professionals' roles, but there is a lack of validated measures of knowledge and skills in this area. This study developed and tested a multiple choice question set for school nurses' depression knowledge and a series of vignettes to examine case recognition skills.

Methods
Relevant literature and an expert panel worked to develop a 24-item knowledge test, and 12 vignettes. Three rounds of panel review assessed face and content validity, and expert agreement of vignette depression status. The measures were piloted with 26 school nurses and, following amendments, used with 146 school nurses. A depression attitude scale was used concurrently so associations between knowledge, attitudes and condition recognition could be explored.

Results
There was an overall satisfactory participant performance on the knowledge measure with 50% correct answers, and less than 5% unanswered. Item analysis indicated most items had adequate difficulties and discriminations. The panel reached overall 89% agreement about the depression status of the vignettes. The vignettes were found to be acceptable and feasible for completion and participant judgments achieved 65% sensitivity and 47% specificity.

Conclusion
The present study has developed psychometrically tested instruments for measuring depression recognition and knowledge. There was evidence for content validity, and limited evidence of convergent validity from associations between measures. Results indicate that several of the questionnaire items may be modified, and that a smaller set of vignettes with clearest expert agreement may be useful in future research.

Keywords: school nurse; depression; adolescents; measurement; education.

Depression is a common and disabling health problem, with a strong potential for recurrence and chronicity. Its 12-month prevalence is around 4%[1], and it is the leading cause of disability in high- and middle-income countries[2]. People with depression most commonly present to primary care providers and often report stress-related difficulties and complaints that include physical symptoms such as fatigue or headache[3]. Among all age groups, people may deny or have difficulty articulating psychological symptoms or have uncertainties and fears about depression and its treatment. The ability of health professionals to identify depression is affected by these presenting characteristics, as well as by clinicians' willingness to discuss psychological issues and their confidence in their own skills and in the available treatment approaches[4][5]. A recent systematic review of depression recognition studies indicates that at least 50% of cases are missed by nurses[6].

Although identifying and appropriately managing depression is necessary throughout the life course, its early identification and evidence-based treatment is especially important for young people because incidence rises sharply around puberty and depression onset is associated with serious effects on social and educational attainments as well as with distress and poor quality of life[7]. A review of epidemiological studies indicates that depression affects around 5% of teenager[8], and longitudinal studies reveal that depression onset in youth is strongly predictive of recurrent mood disorder in adulthood[9].

Young people with mental health problems have low levels of help-seeking from mental health professionals[10], and this reluctance to seek help extends to non-professional supports, especially among young men[11]. The life stage transitions that characterize adolescence may interfere with health professionals' recognition of depression in young people, with professionals possibly interpreting clinical features as understandable teenage angst or transient responses to life problems[12].

Condition recognition by the health professional relates in part to knowledge of the particular constellation of clinical features and their effect on function and behavior, together with an understanding of key aspects of the epidemiology of the disorder, such as prevalence, risk, and etiology. Among the general public, many people cannot recognize depression in vignettes or differentiate it from normal sadness even when they have personal experience with depression[13][14]. Nonspecialist health professionals may also have some limitations in their knowledge about depression and other mental disorders[15].

Educational initiatives have been devised to improve depression knowledge and recognition among professionals, carers, and service users, and a number of instruments have been developed to evaluate outcomes[16-19]. However, in general there has not been adequate examination of the characteristics of these instruments. The Partners in Care (http://www.rand.org/pubs/monograph%5Freports/MR1198.html) depression quality improvement study group constructed a measure for primary care physicians' knowledge of depression that was validated by a clinician panel. This was used in several studies[20][21] as well as being adapted for other settings[22], but its testing and characteristics are inadequately reported, and its validity and utility for other health professionals are limited because its items focus largely on prescribing practice.

Despite a number of studies of educational interventions for nurses' work with depressed patients, there has been little attention to knowledge measurement, with most evaluations relying on untested measures[23][24]. One study to modify nurses' knowledge and practice in this field[25] developed a 20-item depression quiz that appeared to have adequate characteristics, although its development in the early 1990s and testing with nursing students may limit its suitability.

If evaluation of clinical education is to advance, it is important to create measures that can be applied across different projects and settings. The purpose of this study was to develop instruments for measuring both knowledge about depression and the ability to recognize its presenting features that would reflect contemporary understanding of the topic and be appropriate for health professionals working with adolescents as well as adults. These instruments were developed as part of a larger study that examined the effect of a

professional development intervention on the practice of United Kingdom (UK) school nurses in adolescent depression recognition and management (the QUEST [Quality improvement Evaluation for School Nurses and Teachers] project-http://www.health.org.uk/current%5Fwork/demonstration%5Fprojects/ewq%5Fpc.html).

METHODS
Knowledge Measure Development
An initial pool of 60 questions concerning depression and related common mental disorders, with a focus on adolescence and early adulthood, was developed from a review of the literature. Topic content was derived from clinical guidelines for depression management, articles from the field of mental health literacy[13], as well as previously developed tests[26] for health professionals[20][27], lay people and service users[14]. Potential items were selected on the basis of their relevance to depression recognition and management, and particularly for appropriateness to school health teams' work. The content and wording of questions was revised according to the suggestions of a group (N = 21) comprised of school nurses, clinical academics and a service user.

The panel was consulted on 3 occasions to review items for their relevance, the clarity and style of language, and agreement on correct answers. Panel members were asked to comment independently on item relevance, and only items for which a 80% consensus was reached were included in the final question set[28].

The instrument items were divided into the following content areas: clinical features - presentation and symptoms (4 items); condition description (8 items); risk factors and predictors (7 items); management/treatments/referral criteria (5 items) (Appendix A, Supporting Information).

Knowledge Item Analysis
Item difficulty. In this study, the item difficulty index (P) refers to the percentage of correct responses to the item with missing responses scored as incorrect. It is calculated by the formula $P = R/T$, where R is the number of correct responses and T is the total number of responses; the higher this value, the greater the item's ease. Items tend to improve test reliability when the percentage of students correctly answering is halfway between that expected by chance (guessing) and the percentage (100%) who would answer correctly if all test takers knew the answer. So, with a true-false question, the chance level is 0.50, and the optimal difficulty level is $[0.50 + 1.00]/2 = 075$; whilst for a 4 alternative item, the random level is $1.00/4 = 0.25$ so the optimal difficulty level is $[0.25 + 1.00]/2 = 0.625$.

In this study, the item difficulty was considered acceptable if its levels were between 0.20 and 0.90. Values outside these levels should be reviewed, though it may be that an easy "warm-up" question is sometimes appropriate, or that a highly difficult item may be necessary to determine the top performers.

Item discrimination. The item discrimination index (D) measures the relationship between performance on each item and total exam score by comparing results of groups who are high and low overall scorers. Typically, the 27% with the highest and the 27% with the lowest overall scores are used for this analysis[29]. It is calculated by the number in the upper group who correctly answered the item minus the number in the lower group who answered correctly, divided by the number in the largest of the 2 groups. An index score of 0.2 and higher is generally regarded as adequate[30].

Discrimination coefficients. The point biserial correlation (Pearson-product-moment) coefficient was also used to examine the relationship between each item and overall scores. The range is from -1.00 to 1.00, and the higher the value, the more discriminating the item; as with the discrimination index, the acceptable range is 0.20 or higher.[31] The advantage of using discrimination coefficients over the discrimination index is that every test taker is used to compute the discrimination coefficients whilst only 54% (27% upper and 27% lower) are used to compute the discrimination index.

Distracter analysis. In multiple-choice questions, the incorrect choices are termed distracters. The proportion of participants selecting particular distracters was examined for all items during the development and pilot stages, and for the main sample was reviewed in detail for any items that performed poorly with respect to the difficulty and discrimination indices.

Acceptability and reading ease. The omission and completion rate of items were examined to further identify problematic language or item construction, and Flesch and Flesch-Kincaid readability tests were used[32] to determine the reading age of the knowledge and vignette questions.

Vignette Development
The vignettes were developed specifically for this study with the assistance of members of the same expert panel. Relevant clinical guidelines and mental health literacy resources such as the "Friend in Need Questionnaire"[33] were used, together with the clinical experience of the project team. The aim was to construct brief vignettes of young people experiencing a range of life problems, some of which should be interpreted as clinical depression while others portrayed more ambiguous features of distress or adjustment problems. The intention was to provide depictions that mirrored the complexity of these presentations in young people, rather than well-defined depictions of depression contrasted with others lacking any clear diagnostic features. Hence this questionnaire was comprised of vignettes all of which contained some symptoms of depression as described in the Diagnostic and Statistical Manual of Mental Disorders -- 4th Edition[34], but the 5 constructed as probable depression cases had more symptoms of greater severity or a picture of greater symptom persistence or associated disruption of function. The remaining 7 presented life events with various signs of distress but without clear evidence of significant depressive symptoms (Appendix B, Supporting Information).

The vignettes were independently rated by the panel members including 7 clinician experts. Comments and judgments were reviewed, leading to alteration of the character details.

Vignette analyses. For each vignette, participants selected from a 4-point measure:

> 0. unlikely to be depressed
> 1. likely to have some mild features of depression
> 2. likely to have clinically significant features of depression
> 3. highly likely to be clinically depressed.

Ratings were dichotomized so that 0 and 1 were categorized as not depressed, and 2 and 3 as depressed.

The judgments of 7 clinician experts were used to examine and where necessary modify the descriptions of depressive features in the vignettes. Following revisions, an inter-rater reliability analysis using Cohen's Kappa[35] statistic was performed to determine agreement between each of the raters and the intended case status of each vignette. Values for the raters' interpretations[36] ranged between unity (perfect agreement) and 0.526 (moderate agreement), with the mean kappa value 0.792 (substantial agreement) (Table 1).

The extent of agreement expressed in terms of raters' identification of intended cases was 94%, whereas for non-cases, it was 86%. Additionally, the intra-class correlation between the caseness ratings of the different raters for the 12 vignettes was determined[37] as 0.733 (95% CI 0.547 to 0.893; df = 11; p < .001).

Table 1: Expert clinician final ratings of case status of 12 vignettes (C=depression case; NC=non-case)

Vignette	Intended case status	Nurse academic	Nurse specialist	Psychiatrist	GP academic	Nurse specialist	Nurse academic	Psychiatrist	Summary scores	Agreement
1 Jenny	NC	0	0	1	0	0	0	0	NC 0.14	NC 7/7
2 Mark	NC	0	0	0	0	0	0	0-1	NC 0.07	NC 7/7
3 Djamilla	NC	1-2	1	2	0	1	0	1-2	NC 1.0	NC 6/7
4 Raqiya	C	2	2-3	3	3	1	2	2	C 2.2	C 6/7
5 Joe	C	3	2	3	2	1	2	3	C 2.4	C 6/7
6 Sarah	C	2	2	2	2	2	2-3	2-3	C 2.1	C 7/7
7 Gill	C	2-3,	3	3	3	2	3	3	C 2.8	C 7/7
8 Jackie	C	2,	3	3	2-3	2	3	3	C 2.6	C 7/7
9 Omar	NC	1	1	0	2-3	1	2	1	NC 1.21	NC 5/7
10 Julie	NC	1-2	1	2	1	0	1	1	NC 1.07	NC 6/7
11 Keira	NC	0-1	1	1	1-2	1	1-2	1-2	NC 1.0	NC 7/7
12 Rebwar	NC	1	1	2	2	0	1-2	2	NC 1.36	NC 4/7
Cohen's kappa coefficient: inter-rater agreement - intended status/ each rater		1	1	0.526	0.676	0.636	0.833	0.833	NC=42/49 =86%; C+33/35 = 94% Overall 75/84 = 89%	

Attitude Measurement

Participants' attitudes toward depression and its management were examined at the same time using the Depression Attitude Questionnaire (DAQ)[38], a 20-item attitude scale which has been used in many studies involving general practitioners (GPs) and nurses. Its use with a UK-wide sample of this professional group has been described in an earlier paper[39].

Procedure

Following the knowledge and vignette questionnaire development, the questionnaires were piloted with a group of 26 school nurses who formed the workforce of 2 London boroughs. After this, analyses of responses led to final modifications.

The questionnaire was then used with all the available members of the school nurse workforce from 12 London National Health System (NHS) Primary Care Trusts (PCTs). The questionnaires were completed in their team offices supervised by a member of the project team. The attitudes of participants toward depression were examined concurrently using the DAQ.

RESULTS

A total of 146 nurses completed the question and vignette set: 52% of participating nurses were qualified as specialist practitioners (a UK higher level nursing qualification), and the remaining respondents were registered nurses working within school health teams. Ten nurses did not provide detail concerning whether they had qualified as specialist practitioners.

The Flesch Reading Ease rating for the knowledge test was 59.5 and the Flesch-Kincaid Grade 7.4; whereas for the vignettes these ratings were 63.8 and 8.8, respectively. This indicates that both instruments should be easily understandable to students of 13-15 years of age.

Knowledge Test
The mean score achieved was 12.1/24 or 50.4%, ranging from 7 (29%) to 18 (75%). Participants who were specialist practitioners scored modestly higher in the knowledge test (12.4 vs 11.9); but this difference was not statistically significant (t=1.267, df=133, p=.208). The number and percentage of correct responses to each knowledge item in relation to registration status is shown in Table 2.

Table 2. Knowledge Test: Content Area, Participant Response, and Registration Status

Item no.	Item content and knowledge area CD = condition description CF = clinical features R = risk factors T = treatment/ management	Participants Answering Correctly n (%)	Participants Answering Correctly by Registration Status n (%)	
			Specialist Practitioner	Basic Nurse Registration
1.1	Which TWO of the following are CORE features of depression? (CF)	73 (50	39 (54.9)	28 (43.1)
1.2		130 (89.0)	66 (93.0)	55 (84.6)
2 †	How common are depression & anxiety in young people? (CD)	27 (18.5)	15 (21.1)	11 (16.9)
3†	According to the WHO, the disability burden due to depression is predicted to: (CD)	142 (97.3)	68 (95.8)	64 (98.5)
4	Which medication has best evidence for treatment of depression in young people (as recommended in NICE guidelines): (T)	48 (32.9)	25 (35.2)	21 (32.3)
5	Which one of the following could be criteria for referral to specialist CAMHS: (T)	79 (54.1)	46 (64.8)	29 (44.6)
6	How common is self harm among young people in the UK? (CD)	71 (48.6)	32 (45.1)	34 (52.3)
7†	What is the risk of further episodes of depression in someone who has experienced an episode of depression: (R)	43 (29.5)	19 (26.8)	22 (33.8)
8	Depression is a common part of adolescence. (CD)	99 (67.8)	52 (73.2)	40 (61.5)
9	A family history of suicide makes a young person at greater risk for suicide. (R)	98 (67.1)	54 (76.1)	39 (60.0)
10	Antidepressant treatment has been linked to: (T)	53 (36.3)	33 (46.5)	16 (24.6)
11.1	Risk factors for depression in a young person include which TWO of the following: (R)	44 (30.1)	18 (25.4)	23 (35.4)
11.2		55 (37.7)	24 (33.8)	27 (41.5)
12	IPT stands for Intermediate Planned Treatment (T)	35 (24.0)	17 (23.9)	16 (24.6)
13†	Following an act of self-harm, the rate of suicide (R)	73 (50.0)	32 (45.1)	38 (58.5)
14	Suicide is best understood as: (CD)	90 (61.6)	46 (64.8)	39 (60.0)
15†	Do you think that the rates of depression in young people have been: (CD)	28 (19.2)	15 (21.1)	8 (12.3)
16	A number of things can help depression – but which ONE of the following has the *best evidence* as a depression treatment: (T)	55 (37.7)	32 (45.1)	20 (30.8)
17.1	Which TWO of the following are the most important risk factors for suicide? (R)	53 (36.3)	24 (33.8)	27 (41.5)
17.2		131 (89.7)	63 (88.7)	59 (90.8)
18	Depression and anxiety problems are more common in: (CD)	32 (21.9)	12 (16.9)	18 (27.7)
19	Which TWO of the following are *diagnostic features* of depression? (CF)	68 (46.6)	34 (47.9)	29 (44.6)
19.2		123 (84.2)	59 (83.1)	56 (86.2)
20	Suicide rates are fairly uniform throughout the world: (CD)	115 (78.8)	56 (78.9)	53 (81.5)

†Items that require revision or omission.

Table 3 shows the results of the knowledge item response analyses. Sixteen of the 24 items exhibited acceptable characteristics, with difficulty within the specified limits, and either (or both) point-biserial correlation or discrimination index at 0.2 or higher. Eight items were

possibly problematic on the basis of the results obtained, displaying weak discrimination or appearing too easy or difficult. However three of these were components of single questions (phrased "…which two…"-items 1.2; 11.1 and 17.2), and examination of their item characteristics as if these were independent questions may provide inaccurate findings.

Table 3: Knowledge test item analyses

Item no.		Item difficulty	Item difficulty ideal value	Point biserial correlation coefficient total	Item discrimination index	Suggested Item Change
1.1	Which TWO of the following are CORE features	0.50	0.67	0.21*	0.28	
1.2	of depression?	0.89	0.63	0.04	0	
2†	How common are depression & anxiety in young people?	0.19	0.63	0.16	0.15	Change distracters to: Less than1% **Around 5%** Around 20%
3†	According to the WHO, the disability burden due to depression is predicted to:	0.97	0.67	0.01	0	Omit this item
4	Which medication has best evidence for treatment of depression in young people (as recommended in NICE guidelines):	0.33	0.58	0.32**	0.38	
5	Which one of the following could be criteria for referral to specialist CAMHS:	0.54	0.63	0.31**	0.38	
6	How common is self harm among young people in the UK?	0.49	0.63	0.28**	0.33	
7†	What is the risk of further episodes of depression in someone who has experienced an episode of depression:	0.30	0.63	0.15	0.18	Change distracters to: Very unlikely to occur again **More than 30% chance over next 5 years** Highly likely to be depressed again within 5 years.
8	Depression is a common part of adolescence.	0.68	0.75	0.29**	0.38	
9	A family history of suicide makes a young person at greater risk for suicide.	0.67	0.75	0.26**	0.28	
10	Antidepressant treatment has been linked to:	0.36	0.6	0.28**	0.38	
11.1	Risk factors for depression in a young person	0.30	0.7	0.20*	0.18	
11.2	include which TWO of the following:	0.38	0.63	0.21*	0.25	
12	IPT stands for Intermediate Planned Treatment	0.24	0.75	0.33**	0.35	
13†	Following an act of self-harm, the rate of suicide	0.5	0.75	0.13	0.10	Change distracters to: Does not change **Is about 50 times higher** Only increases in men
14	Suicide is best understood as:	0.62	0.63	0.29**	0.15	
15†	Do you think that the rates of depression in young people have been:	0.16	0.75	0.15	0.15	Omit this item
16	A number of things can help depression – but which ONE of the following has the best evidence as a depression treatment:	0.38	0.6	0.39*	0.43	
17.1	Which TWO of the following are the most	0.36	0.7	0.20*	0.18	
17.2	important risk factors for suicide?	0.90	0.7	0.16	0.15	
18	Depression and anxiety problems are more common in:	0.22	0.67	0.37**	0.38	
19	Which TWO of the following are diagnostic	0.47	0.64	0.23**	0.28	
19.2	features of depression?	0.84	0.58	0.22**	0.20	
20	Suicide rates are fairly uniform throughout the world:	0.79	0.75	0.25**	0.30	

**Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
† Items that require revision or omission

One of the remaining 5 items appeared too easy and hence lacked any discriminatory power (item 3): only 4 (3%) participants answered incorrectly. Two of the other problematic items (2;

15) appeared hard with difficulty ratings of 0.19 and 0.15, as well as demonstrating weak discrimination (0.15). The distracter responses for these items indicated that some responses were redundant, and hence should be omitted or modified.

For item 15, most participants (80%) considered depression rates to have increased among young people; however, the responses set as correct were either that these had not changed or that data were insufficient to know[8].

Item 13 concerning suicide risk related to prior self-harm had initially been set with a single response deemed correct (that risk was 100-fold elevated); however, following panel review a decision to mark both 10-fold and 100-fold increases as correct was made (as increased risk rather than the specific value was considered most important). The majority of respondents (87%) indicated that risk was either not affected or 10-fold increased; and although exactly half scored correctly, only 2 noted 100 times higher risk (the "ideal" answer). This question might perform better if phrased with a single correct response that simply contrasted increased risk with no effect.

Finally, item 7 concerning depression recurrence showed limited discrimination (0.18) in the sample; analysis indicated that a distracter (second response) should be omitted or reworded as it may be too similar to the correct response.

Examination of the extent of missing responses showed 19 of 24 items were answered by 95% or more of the participants. Of the 5 items not answered by more than 5% of test takers, item 4 which concerned antidepressant medications was most commonly omitted (by 25% of participants). High total scorers were around half as likely not to answer this item as low total scorers; and more than 4 times as many high total scorers answered this item correctly compared to low scorers. Item 12, concerning the acronym IPT (interpersonal therapy) similarly was not answered by 23% of the nurses. The other items with lower responses were items 5 (12%), 10 (6%), and 11.2 (8%). Overall, it does not appear that the missing responses are associated with poor discrimination, but 4 of these 5 items appeared rather hard, with around two thirds of test takers answering them incorrectly.

Vignette ratings
Participants' rating of the vignettes was examined by comparison with intended depression 'caseness' of the young people described, which had been validated by the panels' consensus.

The responses of the nurse participants revealed 65% sensitivity and 47% specificity. Nurses with a specialist practitioner qualification achieved no differences in sensitivity rating (65%) than their colleagues without this additional qualification, but achieved modestly higher specificity: 51% v 45%, but this difference was not statistically significant (t=1.421, df=134, p=.158).

There was only a very weak correlation between participants' knowledge scores and their detection ability (0.082), and although comparison of detection ability among participants in 27% highest and lowest knowledge test scores indicated a difference of sensitivity of depression recognition 71% v 63%, this was not significant (t=1.623, df76, p=0.109).

Further analyses
Association between knowledge scores, vignette rating performance and attitude measurement by DAQ was examined. There was only a very weak correlation between participants' knowledge scores and their detection ability (0.082), and although comparison of detection ability among participants in 27% highest and lowest knowledge test scores indicated a difference of sensitivity of depression recognition 71% v 63%, this was not significant (t=1.623, df=76, p=.109).

Examining the participants' rating of the two vignettes with clearest depression case status judgements by expert panel scoring (vignettes 7 and 8) and the two vignettes most clearly identified as non-cases (vignettes 1 and 2), marginally influenced these associations:

sensitivity of depression recognition for these two clearest examples showed a modest positive correlation with knowledge scores (r=0.182, p=.029).

There was a significant negative correlation of moderate size between the DAQ attitude factor concerning a pessimistic view of depression and its treatment and the knowledge score of the school nurses (r=-0.248, p=.003).

Discussion
Although the public health impact of depression appears well understood by service providers, and a wide range of training initiatives for primary care and specialist staff exists, there has been relatively little attention devoted to the construction, validation, and dissemination of instruments that may be used to identify training needs and the effects of professional development in this area.

Previous studies indicate that although appropriate training improves clinicians' knowledge of depression, changes in clinical behavior that may lead to improvement in clinical outcomes necessitate the development of practical skills.[40] The development of the vignette measures alongside the knowledge test was an attempt to provide a means of focussing upon and evaluating the type of assessment skills needed for depression recognition -- which is of course fundamental to any ongoing monitoring and management of this condition.

We found that mental health experts from a range of backgrounds can reach clear agreement about the content of a knowledge test about depression and the relevance of particular items: this enables some degree of confidence about its content validity. Content validity is further supported by the review of relevant literature that informed the content coverage. The first use of this measure with school nurses enabled a comprehensive item analysis which indicated that most of the items had adequate difficulties and discrimination.

The knowledge items concerning rates of prevalence and risk exhibited weaker discrimination than other questions. This may indicate that the phrasing of these questions should be revised, or that such quantification was not well understood by the participating nurses. We have suggested modifications for the distracters of 3 of these test items, as well as the removal of 2 related items. It may also be possible that this area is one where nurses' knowledge is limited and further professional development can have an important impact.

The school nurse participants showed a relatively high level of recognition of depression; compared to the rates obtained in evaluations of real-world practice, performance with this test indicated higher depression recognition, but poorer differentiation of "non-cases."[6]

The correlation identified between attitude and knowledge is in the expected direction, and indicates the very plausible link between disagreeing with critical, pessimistic, and deterministic views about depression and greater knowledge about this condition.

Limitations
There are some study limitations. The sample was derived from workforces based in 12 London boroughs and this may limit the generalizability of findings to other school health professionals and to other settings.

Consensus among panel members about depression status of the vignettes was not absolute. This seems likely to have been due to the tension between the aim of evaluating understanding of depression diagnostic features, while making these examples relevant to the complexity of clinical practice by having ambiguous symptoms and situations represented throughout.

The use of vignettes to examine depression recognition skills is problematic. Identifying depression in vignettes is clearly very different to clinical practice, where observing, asking, probing, discussion, and communication with significant others are vital parts of the assessment process. Nonetheless, as a tool to examine skills in recognizing clinical features

and their level of severity, this seems useful and acceptable, and worthwhile in the many situations where real or simulated patients cannot be used to evaluate practice.

Conclusion

Strengths of our study include the extensive development and attention to instruments characteristics. The sample size for this initial study was large enough to enable the planned analyses. Overall, our results suggest that clinicians' knowledge about depression can be evaluated using a brief measure, and that vignettes may be a useful way of examining and measuring aspects of the depression recognition process. Developing and testing measures of knowledge and skills together with an existing attitude measure allows focus on the links between these domains of learning evaluation.[41] Although these measures may be used separately, examining these 3 areas together makes sense for studies exploring the requirement and impact of training. Future research might consider the test-retest reliability of the new measures and their sensitivity to change related to educational interventions.

Implications for school health

School nurses, and other front-line staff such as teachers, social workers, and counselling professionals provide crucial support for adolescents and occupy a key position in identifying depression and assisting in its management. Programmes to assist learning and skill acquisition for this important part of their role have been hampered by a lack of appropriately tested measures. The instruments developed and reported in this paper seek to meet this research and development need.

Human Subjects Approval Statement

This study was approved by a UK National Research Ethics Service (NRES) committee: REC Reference No. 07/H0505/162

SUPPORTING INFORMATION

The following Supporting Information is available for this article:
Appendix A. Question Set: School Nurses' Mental Health Knowledge.
Appendix B. Case Vignettes.

Additional Supporting Information may be found in the online version of this article.

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Appendix A (correct answers have been made bold)
Question set - school nurses' mental health knowledge.
The following 20 questions relate to mental health problems in young people.
They have been designed to help identify the effects of a professional development programme for school nurses.
Try to answer the questions without referring to any literature or other sources of information.
Some questions use percentages: 1% means 1 in a 100; 5 % means 5 in a 100

1. **Which TWO of the following are CORE features of depression? (CF)**

   - Tearfulness
   - Irritability
   - Self harm
   - **Low mood**
   - Reduced concentration
   - **Lack of interest and enjoyment**

2. **How common are depression & anxiety in young people? (CD)**

   - Less than 1% (i.e. less than 1 in a 100)
   - **Around 5%**
   - Around 10%
   - Around 20%

3. **According to the WHO, the disability burden due to depression is predicted to: (CD)**

   - **Increase over the next 10 years**
   - Decrease over then next 10 years
   - Stay the same

4. **Which medication has best evidence for treatment of depression in young people (as recommended in NICE guidelines): (T)**

   - Paroxetine
   - Diazepam
   - Zopiclone
   - Risperidone
   - **Fluoxetine**
   - None of these

5. **Which one of the following could be criteria for referral to specialist mental health services: (T)**

   - **Depression where one or more family members have multiple risk histories for depression**
   - Evidence of drug or alcohol use
   - Exposure to a major loss or life event
   - Evidence of bullying

6. **How common is self harm among young people in the UK? (CD)**

   - Around 1% of young people (i.e. around 1 in a 100)
   - **Around 5% to 10%**
   - Around 10% to 20%
   - More than 20%

7. **What is the risk of further episodes of depression in someone who has experienced an episode of depression: (R)**

   - Very unlikely to occur again
   - 10% chance over next 5 years
   - **More than 30% chance over next 5 years**
   - More likely than not to be depressed again within 5 years.

8. **Depression is a common part of adolescence. (CD)**

   - True
   - **False**

9. **A family history of suicide makes a young person at greater risk for suicide. (CD: R)**

   - **True**
   - False

10. **Antidepressant treatment has been linked to: (T)**

    - A marked increase in suicidal ideas in young people
    - Long term dependence
    - Drug misuse
    - **A potential increased risk of suicide in young people**
    - Increased risk of diabetes

11. **Risk factors for depression in a young person include which TWO of the following: (R)**

    - Above average intelligence
    - **Living with a lone parent**
    - Male gender
    - Having high achieving parents
    - **Parents with low income**

12. **IPT stands for Intermediate Planned Treatment (T)**

    - True
    - **False**

13. **Following an act of self-harm, the rate of suicide (R***) (answer 3 devised as correct, decision made to score 2 & 3 as both correct following pilot)*

    - Does not change
    - **Is about ten times higher**
    - **Is about a hundred times higher**
    - Only increases in men

14. Suicide is best understood as: (CD)

- An act of anger and revenge
- A rational choice
- **An act strongly associated with depression**
- An act that is nearly impossible to predict or prevent

15. Do you think that the rates of depression in young people have been: (CD)

- Increasing over the past 20 years
- Decreasing over the past 20 years
- **Have not changed**
- **Data are not sufficiently accurate to know**

16. A number of things can help depression – but which ONE of the following has the *best evidence* as a depression treatment: (T)

- Omega 3 fatty acids
- **CBT**
- Exercise
- Social support
- Relaxation exercises

17. Which TWO of the following are the most important risk factors for suicide? (R)

- Low self esteem
- Sexual problems
- Eating disorder
- **Clinical depression**
- **Self harm acts**

18. Depression and anxiety problems are more common in: (CD)

- Males
- **Females**
- No gender difference

19. Which TWO of the following are *diagnostic features* of depression? (CF)

- Truanting
- Defiant behaviour
- Drug misuse
- Tearfulness
- **Sleep disturbance**
- **Poor concentration**
- Altered sex drive

20. Suicide rates are fairly uniform throughout the world: (CD)

- True
- **False**

Case vignettes
These vignettes are brief descriptions of young people you might see in your day-to-day work. They all have problems. The purpose of this exercise is purely to identify whether CORE and OTHER CLINICAL features of depression are present, or there is a high likelihood that the person is depressed Please spend no more than TWO MINUTES reviewing and scoring each vignette.

For each of the following vignettes, consider the case presented and score whether:
- **0 unlikely to be depressed**
- **1 likely to have some mild features of depression**
- **2 likely to have clinically significant features of depression**
- **3 highly likely to be clinically depressed**

1. Jenny is a 13-year old girl recently diagnosed with type 1 diabetes. When you speak with her, she appears upset and says 'I don't know how I'll cope with this.' Her parents say she is 'taking it badly', but she appears to managing her school work and maintaining her out of school activities. She says she has felt really down at times since diagnosis, but not all the time.

2. Mark, aged 15, has taken a handful of aspirin tablets after an argument with his mother. This is his fourth episode of self-harm (always by taking 'pills') in two years. He has never had a psychiatric diagnosis and in all previous cases he refused to see a mental health professional or failed to show up for appointments after being seen in the emergency department. His mother is a well-known political figure and she tells you that he is always trying to manipulate her into doing what he wants and always trying to 'get attention'. He denies feeling depressed but demands that you tell his mother to let him transfer to a new school because at his current school 'all the teachers are arseholes'. He threatens to take more pills when he gets home if he is denied his demand.

3. Djamilla, a 14-year old Somali girl who came to the UK three-months ago and lives with an uncle (her other family members remain in Africa or have been killed), asks to see you. She tells you she is worried about a friend and wants to know if you can get pregnant by kissing. Teachers report that she has become preoccupied and is sometimes tearful, leaves lessons frequently to visit the lavatory and is wearing baggy tops.

4. Raqiya is a 14-year old girl reported by her mother to have developed 'mood swings' and to have started mixing with a 'bad crowd'. The girl tells you that nothing is wrong and that her mother is just interfering and controlling. She appears tired and fidgety and has red eyes. She admits to feeling 'down…sometimes' Her teachers are concerned that over the past term she has been missing school with unclear reasons and that her attention is poor.

5. Joe is an 11-year-old boy brought up by his mother and a stepfather. His mother has been subject to episodes of domestic violence at the hands of the stepfather. She has been depressed and sometimes drinks heavily. When very drunk, she told Joe that her life was a misery and it was all because he had been born. In desperation the boy drank a bottle of whisky believing this would kill him and save his mother.

6. Sarah, a 13-year-old girl, has been found in the school toilets with fresh cuts to both upper arms and marks indicating similar cuts in previous weeks. She reports being picked on by her classmates and that her parents are 'rowing all the time'. She denies being sad or hopeless, but admits that she 'feels fed up with things' and can't be bothered with her school work. She is 'off her food' too.

7. Gill, a 12-year-old girl, is increasingly anxious about travelling on the bus to school. Her sleep has become disturbed with early waking, and she has missed school several times recently due to avoiding bus travel. Her parents are concerned that 'she doesn't seem herself…and is fidgety and can't seem to concentrate.' She tells you that she is still interested in her school work but embarrassed and worried about her difficulties coming to school. She

is tearful whilst talking to you, and teachers report that she appears sad and withdrawn in class.

8. Jackie is a 14-year old girl who has been noted by her teachers to be preoccupied with her weight and not eating at lunchtimes. Her school work has deteriorated over past months, with reduced interest in previously favoured subjects noted; she also appears less socially involved with her peer group, and her friends report she seems aloof and disinterested. She has angrily denied that there is any problem, but her parents are worried that she seems unlike her usual self and spends much of her time alone.

9. Omar is 16 years old and was raised in a series of children's homes. He was subjected to repeated abuse as a child and has a history of substance misuse. He has cut his arms since the age of 14 at an average frequency of about once every three weeks. This gives him relief from intense feelings of emptiness and despair. You have been informed that he has recently presented to an emergency department for the third time in a month with superficial cuts to his forearm. He does not describe persisting low mood.

10. Julie is 15. Since the death of her mother from breast cancer 4 months ago she has become withdrawn and disinterested in her school work. Her father and younger brothers have been deeply affected by this death, but have appeared able to resume involvements. She states that she 'does not want to talk about it.'

11. You are asked to see Keira, a 15-year old girl. She has reported violence from her father to the police, but preliminary investigations have resulted in her confessing she made this up. When you speak with her she is tearful and says she hates herself and doesn't see how she can go on after this happening. She can't explain what made her make this allegation. Teaching staff have not noted changes in her behaviour prior to these events.

12. Rebwar is a 13-year old boy who appears to be getting involved in disagreements and fights with classmates and other pupils. He is described as defiant and confrontational by teaching staff, and these characteristics have appeared to increase markedly over the last two terms. He has been truanting and there is a suspicion that he may be experimenting with illicit drugs. When you speak with him, he says he is 'fed up with everything' but then reacts angrily ('..Just leave me alone') when you ask him more about how he is feeling. His parents have recently separated following an affair and repeated angry rows.