Original Article

A Better Strategy for Depression Screening in Chinese Elderly Inpatients

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SUMMARY

Background: To estimate the effectiveness of commonly used depression scales and develop an improved strategy for depression screening among Chinese elderly patients for non-psychiatric geriatricians.
Methods: A cross-sectional study of 458 elderly inpatients aged over 65 years was conducted in a Beijing geriatric ward. Whooley questions, Zung Self-rating Depression Scale (SDS), and Geriatric Depression Scale-15 (GDS-15) were performed by trained geriatricians. Diagnosis of depressive disorders was made following Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5) criteria. We calculated the area under the curve (AUC), sensitivity, specificity, positive and negative predictive value (PPV, NPV) of three depression scales when implemented alone, and in combination.
Results: The GDS-15 common cutoff point was 5, with an AUC of 0.645, sensitivity of 77.5%, specificity of 64.4%, and PPV of 83.2%. Zung SDS yielded an AUC of 0.660, with a sensitivity of 63.7%, specificity of 68.9%, and PPV of 82.3% at the standard cutoff index of 50. At least one positive answer to Whooley questions achieved an AUC of 0.611, a sensitivity of 57.8%, specificity of 64.4%, and PPV of 78.7%. The two-step approach of Whooley questions and GDS-15 showed better performance than another approach of Whooley questions and Zung SDS, by comparing the AUC (0.672 vs. 0.642).
Conclusions: GDS-15 is a routine tool for screening depression among Chinese elderly inpatients. A two-step approach using Whooley questions and GDS-15 can improve the recognition of depressed patients for non-psychiatric geriatricians.

1. Introduction

Depression is a well-recognized geriatric syndrome, particularly among elderly adults with chronic illnesses and cognitive impairment.[1] With the rapid aging of the Chinese population, depression is an increasingly common public mental health problem. A meta-analysis including Chinese older community-dwellers reported a pooled prevalence of 23.6%.[2] The prevalence of depression is reported to be even higher among Chinese elderly inpatients, ranging from 31.07% to 43.16%.[3] In addition to its high prevalence, depression is associated with various health-related outcomes, including falls (odds ratio [OR] = 1.967, 95% confidence interval [CI]: 1.451–2.667), tumor (OR = 2.163, 95% CI: 1.349–3.357), other physical diseases (OR = 1.52, 95% CI: 1.19–1.95), and death (OR = 5.207, 95% CI: 2.487–10.902) among Chinese elderly persons.[4–6]

Despite this, depression, as a geriatric syndrome, is often under-recognized and under-treated in Chinese inpatients.[7] A study conducted in Beijing reported that non-psychiatric physicians failed to detect most cases of depression, with the recognition rate typically no better than 8.6% among elderly patients.[8] These figures are particularly alarming in light of two additional factors. First, geriatric medicine is still in its infancy in China, and many so-called geriatric wards continue to apply a traditional disease-centered model for diagnosis and treatment. Second, depression screening is not currently a routine part of Comprehensive Geriatric Assessment (CGA) among Chinese elderly patients.[9] Moreover, various Chinese versions of depression scales are used, such as the Zung Self-rating Depression Scale (SDS), and the Geriatric Depression Scale-15 (GDS-15),[10,11] and recognition rates of depression vary widely between different scales. A previous study reported that the prevalence of depression screened by GDS-15 in Chinese elderly inpatients was 32.8%,[12] significantly higher than the rate reported by Zung SDS (19.1%).[13] The difference in recognition rates between GDS-15 (41.6%) and Zung SDS (30.1%) was also demonstrated among elderly inpatients from our geriatric ward in a previous study.[14] However, it is currently unclear whether GDS-15 is more valid and effective than Zung SDS for screening depression. Previous research on depression among elderly Chinese patients focused solely on recognition rates. To date, research in mainland China has been insufficient to ascertain which depression scale should be preferentially used in CGA among elderly inpatients.

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The American Geriatric Society (AGS) recommends screening for depression in elderly individuals using GDS-15, which has been validated in geriatric inpatients.[15] This differs from the traditional approach in mainland China, in which Zung SDS is commonly used by psychiatrists as a primary tool for evaluating depression.[16] In the United Kingdom, the National Institute for Health and Care Excellence (NICE) recommends Whooley questions as a first-line screening method in high-risk patients with chronic physical health problems, which has been demonstrated in primary care settings.[17,18]

The objective of the current study was to demonstrate a routine tool for screening depression in CGA by investigating the effectiveness of Whooley questions, GDS-15, and Zung SDS. We also examined the performance of combining Whooley questions with GDS-15 or Zung SDS, to investigate a potentially better strategy among Chinese elderly inpatients for non-psychiatric geriatricians.

2. Materials and methods

2.1. Patients

From January 1st, 2018 to December 31st, 2019, patients $\geq$ 65 years were included consecutively in the geriatric ward. Patients with severe hearing and visual impairment, severe cognitive dysfunction, failure to complete the measurement, excessively poor physical condition, or who were receiving tumor interventional therapy were excluded. This was a cross-sectional retrospective study approved by the Ethics in Research Committee of Peking Union Medical College Hospital (PUMCH, S-K1310).

2.2. Measurements

2.2.1. Whooley questions

Whooley questions include "During the past month, (1) have you often been bothered by feeling down, depressed or hopeless?" (2) have you often been bothered by having little interest or pleasure in doing things?" The two-question instrument takes less than 1 minute to complete. A "yes" answer to either of the two questions is considered a positive test.

2.2.2. Zung SDS

The Zung SDS consists of 20 items. Each item can be scored from 1 to 4. An index is obtained by multiplying the raw sum score by 1.25. A score of 50 or greater is considered depression. Zung SDS typically takes less than 10 minutes to complete. A previous study reported that the Chinese version of Zung SDS had good reliability.[19]

2.2.3. GDS-15

Each of the 15 items is coded as 0 (no) or 1 (yes). A score of 5 or more indicates depression. GDS-15 takes less than 5 minutes to complete. GDS-15 has been translated into Chinese and validated in the elderly with satisfactory reliability and validity.[20]

2.3. Procedures

Demographic and clinical data were collected. Depression screening in CGA was carried out with Whooley questions, Zung SDS, and GDS-15. The interviewers were geriatricians who had been trained for 1 week and passed examinations. Geriatricians used multidimensional evaluation to choose suspected depressed patients who had at least one symptoms verified by previous literature to accept psychiatric interviews, including emotional symptoms, psychiatric symptoms, sleep problems, cognitive problems, history of non-severe

mental illness, had been trained for medically unexplained symptoms, and lack of compatibility with treatment.[21–23] Depressive disorders were diagnosed by a psychiatrist following the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5) criteria. The diagnosis of depressive disorders included major depressive episodes, dysthymia, depressive disorders caused by somatic diseases, and substance-induced depressive disorders.

2.4. Statistical analysis

Descriptive and analytical statistics were conducted with SPSS Statistics 22.0 (IBM Corporation, New York, NY, USA) and MedCalc 19.3 (MedCalc Software Ltd, Acacialaan 22, Ostend, Belgium). Quantitative variables were recorded as mean, standard deviation (SD). Categorical variables were reported as frequencies and proportions. To measure the effectiveness of depression scales, we calculated the area under the curve (AUC), sensitivity, specificity, positive and negative predictive value (PPV, NPV), positive and negative likelihood ratio (LR+, LR–), and consistency rate. Diagnostic value differences between depression scales were analyzed by comparing receiver operating characteristic (ROC) curves. Kappa alpha was used to evaluate the consistency between depression scales and psychiatric diagnosis. $p < 0.05$ was considered to indicate statistical significance.

3. Results

3.1. Patients characteristics

The design of the study is shown in Figure 1. A total of 458 elderly patients were assessed. Consequently, the final dataset contained data from 458 patients with a mean (SD) age of 73.8 (7.3) years, ranging from 65 to 95 years. 56.1% of them were female. The characteristics of the entire sample are shown in Table 1.

3.2. Diagnostic accuracy of screening with single depression scale

On Whooley questions, 75 (16.4%) patients responded positively to one question, and 39 (8.5%) answered positively to both questions. On Zung SDS, depression was present in 132 (28.8%) patients. According to GDS-15, 182 (39.7%) cases were positively detected.

Geriatricians identified 147 (32.1%) patients with high risk of depression to undergo psychiatric interviews. Of these, 102 (69.4%) cases were diagnosed with depressive disorders. The mean score of depression scales is shown in Table 2 according to depressive and non-depressive patients. The effectiveness of depression scales is shown in Table 3. Assessment with Whooley questions correctly classified 88 of 147 (59.9%) cases and demonstrated agreement with the interview results, indicated by Kappa value of 0.191 (p = 0.001). If at least one question was positive, the sensitivity was 57.8%, specificity was 64.4%, PPV and NPV were 78.7% and 40.3% respectively. The diagnostic accuracy of Whooley questions was 0.611 (95% CI: 0.513–0.710, p = 0.032). For Zung SDS, ROC analysis showed an AUC of 0.660 (95% CI: 0.581–0.739, p = 0.002), with a consistency rate of 65.3%, sensitivity of 63.7%, specificity of 68.9%, and PPV of 82.3% at the recommended cutoff index of 50. There was relatively strong agreement between the scale and the interview (Kappa = 0.285, p = 0.003). For GDS-15, consistency with the interview results was 0.279 (p = 0.001). The ROC analysis showed an AUC of 0.645 (95% CI: 0.562–0.722, p = 0.005), with a consistency rate of 73.5%, sensitivity of 77.5%, specificity of 64.4%, and PPV of 83.2% at the standard cutoff score of 5. However, no diagnostic differences
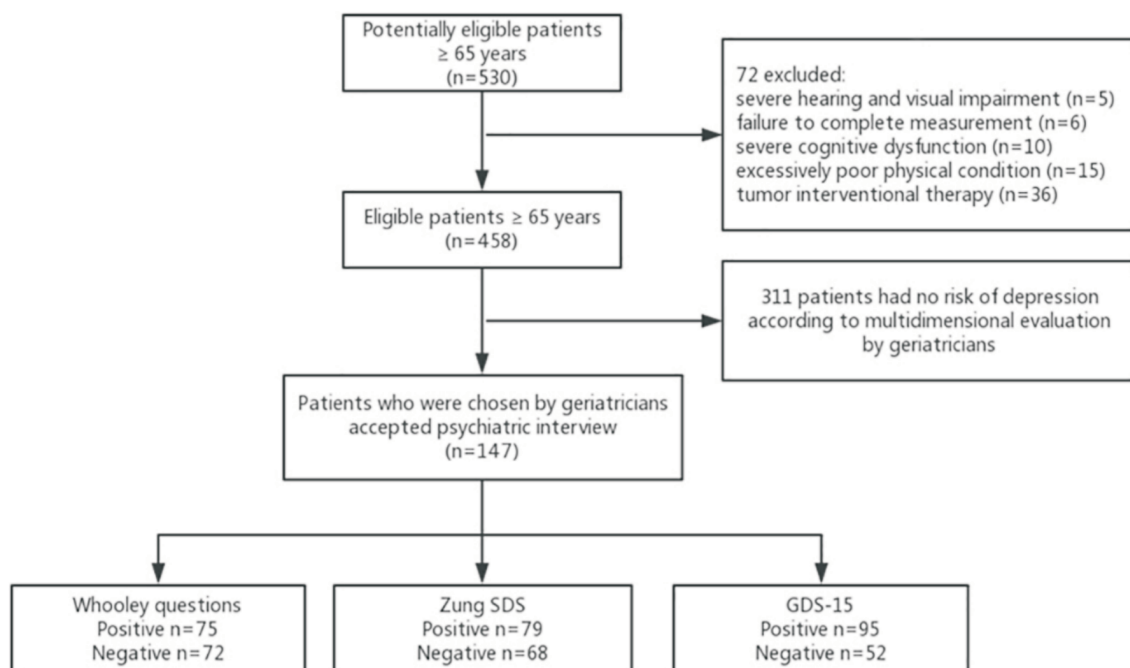
Figure 1. The flow of the study for screening and diagnosing depressive disorders in the geriatric ward.

Table 1
Demographic characteristic of participants (N = 458).

Characteristics	N or mean	% or SD
Age (years)	73.8	7.3
Gender		
Male	201	43.9
Female	257	56.1
Marriage		
Married	327	71.4
Single, separated, or windowed	131	28.6
Education		
Below primary school	99	21.6
Primary school	187	40.8
Above primary school	172	37.6
Smoke	162	35.4
Alcohol	83	18.1
MCC	5.8	1.6

MCC, multiple chronic conditions; SD, standard deviation.

Table 2
Mean score of Zung SDS and GDS-15 according to depressive and non-depressive patients (N = 147).

Instruments	Total (N = 147)	Depressive (N = 102)	Non-depressive (N = 45)	p value
Zung SDS score, mean (SD)	51.8 (13.4)	54.4 (13.6)	45.8 (11.1)	0.000
GDS-15 score, mean (SD)	6.0 (3.2)	6.8 (3.3)	4.3 (2.3)	0.000

SD, standard deviation.

among three single depression scale were observed (Whooley questions vs. Zung SDS, p = 0.299; Whooley questions vs. GDS-15, p = 0.568; Zung SDS vs. GDS-15, p = 0.701).

3.3. Diagnostic accuracy of screening with combined depression scales

NICE guidelines suggested using a two-step approach in which the two depressive questions were used for initial screening, followed by secondary screening for participants who responded positively. To define which scale performed best for secondary screening, we tested the two-step approach in the present study. A comparison of depressive patients defined by three depression scales is shown in Table 4. The two-step approach containing Whooley questions and the GDS-15 screened 56/147 positive patients, producing higher specificity of 84.4%, and PPV of 87.5%, compared with GDS-15 alone. The ROC analysis showed better diagnostic performance (AUC = 0.672, 95% CI: 0.581–0.763, p = 0.002). In another two-step approach of Whooley questions and Zung SDS, 55/147 patients responded positively. The AUC was 0.642 (95% CI: 0.548–0.735, p = 0.006), with a specificity of 82.2%, PPV of 85.5%. However, no significant differences were observed between these two combined approaches (p = 0.400).

Depression in elderly patients may be characterized by unex-

Table 3
Performance characteristics of depression scales for diagnosis of depressive disorders according to DSM-5.

Depression scales	Se (%)	Sp (%)	PPV (%)	NPV (%)	LR+	LR−	Consistency rate (%)	AUC (95% CI)
Single screening								
Whooley questions	57.8	64.4	78.7	40.3	1.63	0.65	59.9	0.611 (0.513–0.710)
Zung SDS	63.7	68.9	82.3	45.6	2.05	0.53	65.3	0.660 (0.581–0.739)
GDS-15	77.5	64.4	83.2	55.8	2.18	0.35	73.5	0.645 (0.562–0.722)
Combined screening								
Two-step approach								
Whooley questions and Zung SDS	46.1	82.2	85.5	40.2	2.59	0.66	57.1	0.642 (0.548–0.735)
Whooley questions and GDS-15	48.0	84.4	87.5	41.8	3.08	0.62	59.2	0.672 (0.581–0.763)
Simultaneous approach								
Whooley questions and Zung SDS	75.5	51.1	77.8	47.9	1.54	0.50	68.0	0.633 (0.532–0.734)
Whooley questions and GDS-15	83.3	35.6	74.6	48.5	1.29	0.47	68.7	0.594 (0.491–0.698)

AUC, area under curve; NPV, negative predictive value; PPV, positive predictive value; Se, sensitivity; Sp, specificity; 95% CI, 95% confidence Intervals.

Table 4

Comparison of screening results according to Zung SDS, GDS-15 and Whooley questions.

Instrument	Whooley questions	
	Positive (n = 75)	Negative (n = 72)
Positive		
By Zung SDS (n = 79)	55	24
By GDS-15 (n = 95)	56	39
Negative		
By Zung SDS (n = 68)	20	48
By GDS-15 (n = 52)	19	33

plained physical symptoms, not only mood changes. Both Zung SDS and GDS-15 contain several items related to physical symptoms, whereas Whooley questions do not. We used our data to imitate the simultaneous approach. If one patient screened positively on Whooley questions or Zung SDS, we defined it as a positive test. In a simultaneous approach (Whooley questions and Zung SDS), 99/147 cases responded positively to at least one scale, yielding an AUC of 0.633 (95% CI: 0.532–0.734, p = 0.010), and a sensitivity of 75.5%. The Kappa value was 0.261 (p = 0.002), showing a relatively strong agreement with the interview results. Similarly, if a case responded positively to Whooley questions or GDS-15, we considered the result was positive. The simultaneous approach (Whooley questions and GDS-15) screened 114/147 positive patients, exhibiting an AUC of 0.594 (95% CI: 0.491–0.698, p = 0.068), and sensitivity of 83.3%. The consistency with interview results was 0.204 (p = 0.011) using Kappa value. There were no diagnostic differences between these two approaches (p = 0.314).

4. Discussion

4.1. High prevalence of depression in Chinese elderly inpatients

In the current study, the prevalence of depression reached up to 39.7% with GDS-15 screening, which is substantially higher than that reported among older community-dwellers previously (23.6%).[2] There are several reasons for this finding. First, together with the process of aging, substantial weakening of physical functions, impaired cognitive function and disease resistance, as well as the loss of social roles and social isolation can trigger depression. Second, PUMCH is a tertiary hospital, and a large number of elderly people with MCC, acute or sub-acute diseases are admitted to the geriatric ward. Thus, patients may be more vulnerable to mood disorders. Third, geriatricians can detect geriatric depression with the help of CGA, and the recognition rate of geriatricians is higher than that of other non-psychiatric physicians.[8]

4.2. Performance of depression scales in elderly inpatients

High sensitivity is important for screening scales so that a high proportion of individuals with depression are identified for further assessment. Besides, screening scales should have appropriately high PPV values to avoid excessive numbers of false-positive cases. Regarding the effectiveness of depression scales, GDS-15 demonstrated a better sensitivity, PPV and consistency rate than Zung SDS and Whooley questions in the current study. This may be related to the complexity of Zung SDS itself, whereas GDS-15 is easy and straightforward to answer in YES or NO format, particularly for geriatric inpatients with complex chronic diseases and cognitive impairment. Although Zung SDS showed better performance than GDS-15,

the difference was not significant statistically. Moreover, GDS-15 is less burdensome for elderly patients, more comfortable to use and less time consuming than Zung SDS. A similar study from the United Kingdom also demonstrated that GDS-15 was a valid instrument, with a sensitivity of 82.4%, and specificity of 60.0%.[24] Also, the AGS recommends GDS-15 for clinicians to screen for depression in older adults.[15] The current findings also revealed that using Whooley questions alone was not valid. A previous study conducted among primary care elderly patients in Switzerland reported that sensitivity of Whooley questions reached up to 91.3%.[25] This discrepancy may be ascribed to differences in the study setting, population, and culture. Most elderly patients in our study suffered from multimorbidity and were more likely to complain of somatic symptoms because of embarrassment regarding directly expressing emotional problems.[26,27] Thus, using Whooley questions alone to screen for depression resulted in false-negative cases. Therefore, GDS-15 is particularly suitable for screening depression in Chinese elderly inpatients due to its brevity and efficiency.

NICE guidelines for depression suggest that an appropriate next step for "at-risk" elderly adults who respond positively to two depressive questions is a further mental assessment using a recognized screening instrument. In the current study, we examined the performance of the two-step approach involving Whooley questions followed by GDS-15 or Zung SDS. The GDS-15 performed better than Zung SDS as a secondary screening method, by comparing AUCs (0.672 vs. 0.642). Although there were no significant differences, GDS-15 indeed is more time-saving, convenient, and easy to understand than Zung SDS. This finding was in accord with evidence reported by Collins,[28] who verified that a two-step approach utilizing two screening questions followed by GDS-15 among elderly patients could reduce the number of false-positive cases compared with GDS-15 screening alone. Therefore, conducting Whooley questions before GDS-15 assessment may improve the accuracy of detecting depression, particularly when mental health services are limited in China.[29]

Moreover, the current study demonstrated that, in the simultaneous approach, the sensitivities of both assessment combinations were significantly higher than either single assessment. Whooley questions represent essential and typical symptoms of depressive disorders. Thus, screening for depression among elderly inpatients should not only focus on whether screening scores are positive, but also on the essential features of depressive disorders to reduce false negative rates. The results suggest that combined application of Whooley questions and GDS-15 can identify depression with more sensitivity than the combination of Whooley questions with Zung SDS.

The current study had several important strengths. Since the geriatric ward was established in 2007, CGA for elderly persons and Geriatric Interdisciplinary Team Training for geriatricians were established, eventually becoming the GEMU. The model described above has reached a broad consensus in Geriatric Medicine in China. Thus, the conclusions of the current study have important implications. The study was designed to elucidate the usefulness of different depression scales. However, some commonly used scales were not examined in the present study. Besides, due to the working model of our geriatric ward, only patients with suspected depression underwent interviews to obtain a psychiatric diagnosis, rather than all patients. However, we do not consider this restriction to be a serious problem for the current results. The selection of patients for interviews was performed based on their clinical conditions and symptoms verified in previous studies, not on depression scale scores. Because the study was conducted in a real-world setting, the findings

are still generalizable.

In conclusion, depression is extremely common among Chinese elderly inpatients in general hospitals. The GDS-15 is a recommended depression screening tool in CGA among Chinese elderly inpatients with its good sensitivity. In two-step approach, Whooley questions can be used for first-line screening, with GDS-15 being used for follow-up. Strategic application of Whooley questions and GDS-15 could improve identification of depressed patients. Further research is required, particularly assessment of the performance of two-step approaches for inpatients, outpatients, and older community-dwellers, and evaluation of the acceptability of depression scales for patients and carers.

Declaration of any potential financial and non-financial conflicts of interest

None.

References

1. Alexopoulos GS. Depression in the elderly. *Lancet.* 2005;365:1961–1970.
2. Li D, Zhang DJ, Shao JJ, et al. A meta-analysis of the prevalence of depressive symptoms in Chinese older adults. *Arch Gerontol Geriatr.* 2014;58: 1–9.
3. Han JM, Wang ZY, Yang L, et al. Meta analysis of the detection rate of depression in elderly people from hospitals in China. *Chinese Journal of Gerontology.* 2019;39:1117–1121. [In Chinese]
4. Shi R, Wu L, Zhang T. Elderly falling information and analysis of risk factors in Hubei Province. *Acta Medicinae Universitatis Science of Technologiae Huazhong.* 2012;41:500–503. [In Chinese]
5. Feng J, Lang SY, Song KQ, et al. New tumor morbidity and mortality in male elderly depressive patients with chronic somatic diseases. *Chinese Journal of Multiple Organ Diseases in the Elderly.* 2008;7:392–394. [In Chinese]
6. Li CB, He YL, Zhang MY. The impact of depressive symptoms on psychological and physical outcomes: a 5-year follow-up study of elderly at the community level. *Zhonghua Liu Xing Bing Xue Za Zhi.* 2002;23:341–344. [In Chinese, English abstract]
7. Xie ZJ, Lv XZ, Hu YD, et al. Development and validation of the geriatric depression inventory in Chinese culture. *Int Psychogeriatr.* 2015;27: 1505–1511.
8. Lyu Y, Li Z, Han MY, et al. Reasons for delay in seeking for mental health care among Chinese elderly people with depressive disorder. *Chinese Nursing Management.* 2015;15:433–436. [In Chinese, English abstract]
9. Gao C, Yu PL. Progress on the geriatric interdisciplinary team work model.
Chin J Geriatr. 2020;39:238–240. [In Chinese, English abstract]
10. Liu R, Shao WC, Zhao X, et al. Analysis of the relative factors of depression in hospitalized elderly patients with chronic diseases. *Chin J Geriatr.* 2018;37:37–40. [In Chinese, English abstract]
11. Kou XJ, Gong CP, Liu XJ, et al. The prevalence and associated factors of anxiety and depression among elderly people in community in Wuhan. *Chinese Journal of Gerontology.* 2018;38:2529–2531. [In Chinese]
12. Zou C, Chen S, Shen J, et al. Prevalence and associated factors of depressive symptoms among elderly inpatients of a Chinese tertiary hospital. *Clin Interv Aging.* 2018;13:1755–1762.
13. Zhang HP, Guan SM, Zhang YH. Study on depression in aged in-patients in general department. *Acta Universitatis Medicinae Tongji.* 2000;29:594–596. [In Chinese, English abstract]
14. Liu S, Zhu ML, Liu XH. Correlation between frailty and depression in the elderly hospitalized patients. *Chinese Journal of Multiple Organ Diseases in the Elderly.* 2020;19:419–423. [In Chinese]
15. Talebreza S, Manle NA, Beizer JL, et al, eds. *Geriatrics Evaluation & Management Tools.* New York, USA: American Geriatrics Society; 2018.
16. Wang RZ, Liu LF, Cui KY, et al. Study on the feasibility of the Self-rating Depression Scale as a routine screened implement for depressive disorder of internal medicine inpatients. *China Journal of Health Psychology.* 2009;(8):923–925.
17. NICE-National Institute for Health and Care Excellence. *Depression in adults with a chronic physical health problem: recognition and management. London, UK: NICE; 2009. Available at* https://www.nice.org.uk/guidance/cg91. Accessed March 23, 2020.
18. Bosanquet K, Mitchell N, Gabe R, et al. Diagnostic accuracy of the Whooley depression tool in older adults in UK primary care. *J Affect Disord.* 2015; 182:39–43.
19. Lee HC, Chiu HF, Wing YK, et al. The Zung Self-rating Depression Scale: screening for depression among the Hong Kong Chinese elderly. *J Geriatr Psychiatry Neurol.* 1994;7:216–220.
20. Chiu HF, Lee HC, Wing YK, et al. Reliability, validity and structure of the Chinese Geriatric Depression Scale in a Hong Kong context: a preliminary report. *Singapore Med J.* 1994;35:477–480.
21. Fried EI, Epskamp S, Nesse RM, et al. What are 'good' depression symptoms? Comparing the centrality of DSM and non-DSM symptoms of depression in a network analysis. *J Affect Disord.* 2016;189:314–320.
22. Erdal KJ. Depressive symptom patterns in patients with Parkinson's disease and other older adults. *J Clin Psychol.* 2001;57:1559–1569.
23. Hong X, Wei J, Zhao XH, et al. Retrospective analysis of liaison psychiatric service in elderly inpatients in a general hospital. *Zhongguo Yi Xue Ke Xue Yuan Xue Bao.* 2016;38:422–427.
24. Pomeroy IM, Clark CR, Philp I. The effectiveness of very short scales for depression screening in elderly medical patients. *Int J Geriatr Psychiatry.* 2001;16:321–326.
25. Magnil M, Gunnarsson R, Björkelund C. Using patient-centred consultation when screening for depression in elderly patients: a comparative pilot study. *Scand J Prim Health Care.* 2011;29:51–56.
26. Sun KS, Lam TP, Wu D. Chinese perspectives on primary care for common mental disorders: Barriers and policy implications. *Int J Soc Psychiatry.* 2018;64:417–426.
27. Bushnell J, McLeod D, Dowell A, et al. Do patients want to disclose psychological problems to GPs? *Fam Pract.* 2005;22:631–637.
28. Esiwe C, Baillon S, Rajkonwar A, et al. Screening for depression in older adults on an acute medical ward: the validity of NICE guidance in using two questions. *Age Ageing.* 2015;44:771–775.
29. Li N, Du W, Chen G, et al. Mental health service use among Chinese adults with mental disabilities: a national survey. *Psychiatr Serv.* 2013;64:638–644.