Validation of the Distress Thermometer in a UK Renal Population

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Background

Elderly patients with advanced chronic kidney disease (CKD) and multiple co-morbidities have high symptom and depression scores in cross-sectional studies. However, long-form measurements of depression and symptom burden are not practical for regular routine screening use in all patients. Originally devised by Roth et al (1999) for the National Comprehensive Cancer Network (NCCN), the Distress Thermometer (DT) is a simple self-scoring visual analogue scale for recording global distress (a composite of physical wellbeing, psychosocial and spiritual issues). We have found it quick and easy to use, even in our multi-ethnic CKD population. We now use it as a tool to enhance communication and ensure a patient-centred approach at all low clearance clinic (LCC) patient visits.

Aim: To validate the Distress Thermometer against the widely-used Beck Depression Inventory II (BDI-II), Hospital Anxiety and Depression Scale (HADS), Memorial Symptom Assessment Score (Short Form) (MSAS-SF) and SF36 scores, in a UK renal population, and to assess acceptability to patients.

Methods: We recruited patients from low clearance clinics and haemodialysis units at the Royal Free and Lister Hospitals. The Distress Thermometer, BDI-II, HADS, MSAS-SF and SF36 questionnaires were administered simultaneously, either during dialysis sessions or at routine out-patient appointments.

Analysis Receiver Operator Characteristic analysis was used to compare the DT with the HADS and BDI-II, and sensitivity and specificity were calculated. As there is no cut-off for the MSAS-SF and SF-36 questionnaires, linear regression was used to show the relation between the DT and these scores. We also carried out a smaller questionnaire study to gauge acceptability of the Distress Thermometer.

The Distress Thermometer

1. Please circle the number (0-10) that best describes how much distress you have been experiencing in the past week including today.

Extreme Distress 10 9 8 7 6 5 4 3 2 1 No Distress 0

2. Please indicate if any of the following has been a problem for you in the past week including today. Be sure to check YES or NO for each.

YES	NO	Practical Problems
☐	☐	Child care
☐	☐	Housing
☐	☐	Insurance / financial
☐	☐	Transportation
☐	☐	Work / school

YES	NO	Family problems
☐	☐	Dealing with children
☐	☐	Dealing with partner
☐	☐	Dealing with close friend / relative

YES	NO	Emotional problems
☐	☐	Depression
☐	☐	Fears
☐	☐	Nervousness
☐	☐	Sadness
☐	☐	Worry
☐	☐	Loss of interest in usual activities

YES	NO	Spiritual / religious concerns
☐	☐	Any spiritual / religious concerns

YES	NO	Physical problems
☐	☐	Appearance
☐	☐	Bathing / dressing
☐	☐	Breathing
☐	☐	Changes in urination
☐	☐	Constipation
☐	☐	Diarrhoea
☐	☐	Eating
☐	☐	Fatigue
☐	☐	Feeling swollen
☐	☐	Fevers
☐	☐	Getting around
☐	☐	Indigestion
☐	☐	Memory / concentration
☐	☐	Mouth sores
☐	☐	Nausea
☐	☐	Nose dry / congested
☐	☐	Pain
☐	☐	Sexual
☐	☐	Skin dry / itchy
☐	☐	Sleep
☐	☐	Tingling in hands / feet

Other problems

Results

We recruited 319 patients. Mean age was 67years, and 68% were male, in keeping with our population.

ROC curve analysis:

DT / HADS (case = HADS >11) AUC 0.76 (CI 0.70-0.82, p<0.001)

DT / BDI-II (case = BDI ≥20) AUC 0.87 (CI 0.83-0.92, p<0.001)

We suggest using a cut-off of ≥7 when using the Distress Thermometer as a screening tool – this gives a specificity of 89.9% for the HADS, and 91.5% for the BDI-II:

	DT cut off ≥5	DT cut off ≥6	DT cut off ≥7
HADS	PPV = 49.5% NPV = 82.3% Sens = 60.2% Spec = 75.1%	PPV = 53.7% NPV = 78.1% Sens = 40.9% Spec = 75.3%	PPV = 53.2% NPV = 75.6% Sens = 28.4% Spec = 89.9%
BDI	PPV = 39.4% NPV = 94.8% Sens = 80.4% Spec = 74.5%	PPV = 49.2% NPV = 91.8% Sens = 62.7% Spec = 86.6%	PPV = 53.3% NPV = 89.3% Sens = 47.1% Spec = 91.5%

Linear regression demonstrated a moderate correlation between DT scores and MSAS-SF (fig 3), and an inverse correlation between DT scores and the SF-36 general health, emotional well-being and energy sub-scales (data not shown). There was no relationship between the DT and other SF-36 subscales.

Median time taken to complete the DT was 4mins (IQR 3-5mins). 285/319 people completed the acceptability questionnaire – of these only 4/285 felt upset by being asked to complete the Distress Thermometer, and of the 5/285 who suggested changes, 3 suggested changes to the reference questionnaires and not to the DT itself.

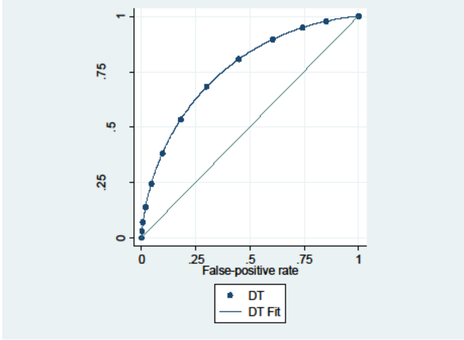

Fig 1: ROC curve for HADS

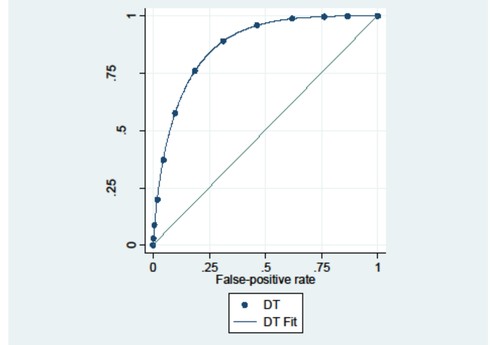

Fig 2: ROC curve for BDI-II

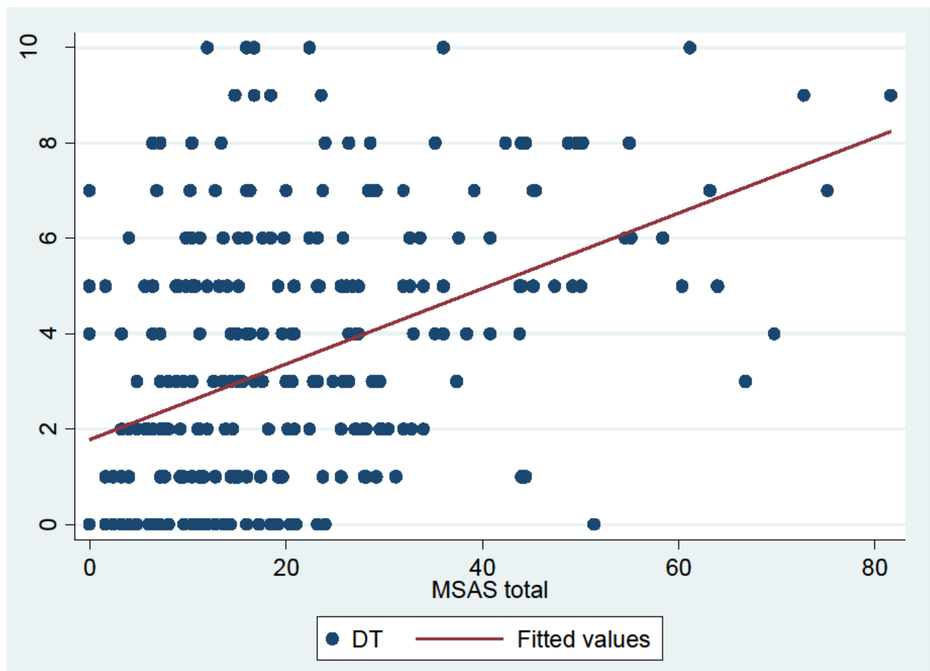

Fig 3: Linear regression for MSAS-SF (Renal)

Discussion

The Distress Thermometer is a quick, acceptable and valid tool in UK renal population, especially for older and frailer patients who may have difficulty completing longer tools. It may be used as an ultra-short depression screening tool in both CKD and dialysis populations (using a cut-off of ≥7 for "caseness").

We have also found it to have utility as a general aid to discussion during the clinical consultation even in those patients who do not meet the criteria for "caseness", as a way of ensuring a patient-led agenda.

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