Addiction Severity Index

Composite Scores Manual

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DESCRIPTION AND CONSTRUCTION OF ASI COMPOSITE SCORES

History and Rationale of the Composite Measures

The Addiction Severity Index is an interview designed to detect and measure the severity of potential treatment problems in seven areas commonly affected by alcohol and drug dependence. These areas are: medical, employment, alcohol, drug, legal, family/social and psychiatric problems. When the instrument was constructed, these p problem areas were specifically selected and questions were included to tap potential problem symptoms in each area.

From the beginning we were interested in developing reliable and valid measures of patient status in each of these areas: measures which could be compared at the start of treatment and at subsequent evaluation points as a means of detecting improvement. Two types of these general status measures were developed. First, the "severity ratings" were developed to allow a trained interviewer to estimate problem severity in each of the ASI areas, using a ten-point scale. These ratings were shown to produce reliable and valid estimates of patient status in each area and are of great practical value in 1) summarizing the patient's overall status at treatment admission, 2) formulating an initial treatment plan and 3) providing a general prognosis for treatment. However, despite their reliability and validity these severity ratings were subjective estimates of patient status and we did not feel they were appropriate as criteria for measuring change.

For this reason, we elected to develop a second type of general status measure in each problem area based upon the sum of several individual questions within the problem area. We decided not to use any of the factor analysis procedures to construct these measures although this would have been a reasonable solution. We did not choose factor analysis because we knew in advance that several items within each ASI problem area would not be appropriate as measures of change (e.g., how many years of education have you completed?) Also, it is often difficult to interpret factors and to rule out alternate interpretations. Finally, we had no evidence to suggest that any single item should be weighted more than any other item in the determination of the general problem status measure.

For these reasons, we developed an empirical method of combining those items from each problem area which were capable of showing change and which were well related to each other (see Description of the Weighting Procedure). This method entailed the intercorrelation of the potential items within each problem area to remove those which

were not well related and then testing their internal consistency or reliability using Cronbach's method (1). Subsequent testing revealed an alpha score of .70 or higher on each composite, indicating significant internal consistency. Further, comparisons with other well-validated measures of each ASI problem area indicated significant convergent validity in all composite scores (2).

In summary, the selective combination of items from each of the ASI problem areas has resulted in general measures of patient status in each area. These measures are mathematically derived and have shown reliability and validity in several settings. These

composite score measures may be calculated from the ASI results and are appropriate as change measures or outcome indicators in all standard analyses (3).

Description of the Weighting Procedure

Each composite score is the sum of answers to several questions within an ASI problem area. After both clinical discussion and empirical investigation, we had no evidence to suggest that any single item should be considered more prominently (i.e., should count more) than any other item in the determination of a composite score. Thus our intention has been to give equal weighting to all questions within a composite score. However, since there is often great variability in the range of possible answers to the questions within a composite, a simple summation of answers would not insure equal contribution of all questions. For example, in the case where a question that has a maximum possible answer of 4 (i.e., a patient rating scale) is combined with a question having a maximum answer of 2000 (i.e., how much money have you earned in the past month?), there would be obvious inequality in the contribution of the total variability of the composite score.

In order to correct this we have adjusted each composite for the answer range of each item and for the total number of items in the composite. This is done mathematically through two division steps. For example, the composite score on the medical problem area is composed of three ASI items:

A. How many days have you experienced medical problems in the last 30?

Maximum value = 30.

4

B. How troubled or bothered have you been by your medical problems in the

past 30 days? Maximum value = 4 (Rating).

C. How important to you now is treatment for these medical problems?

Maximum value = 4 (Rating).

Each question is divided by its maximum answer value and by the total number of

questions in the composite. These individual results are then summed. In the present

example we will imagine that the subject reported 15 days of medical problems (A),

considerable (rating = 3) bother with those problems (B) and an extreme (rating = 4)

need for treatment (C). The composite score is calculated below:

(A) $\underline{15}$ + (B) $\underline{3}$ + (C) $\underline{4}$ = $\underline{.5}$ + $\underline{.75}$ + $\underline{1.0}$ = .750
    30   4   4   3   3   3

or the mathematical equivalent

(A) $\underline{15}$ + (B) $\underline{3}$ + (C) $\underline{4}$ = $\underline{15}$ + $\underline{3}$ + $\underline{4}$ =   .750

     30x3   4x3   4x3   90   12   12

SPECIAL CIRCUMSTANCES

Employment Composite

All composite scores are calculated in the above manner but there are special situations

that occur in some composites. First, the majority of content areas within the ASI are

potential problems for the subjects and the ASI questions attempt to determine the

number, duration, and intensity of problem symptoms in these areas. Thus, the composite

scores, like the severity ratings, are measures of problem severity, with <u>higher scores</u>

indicating greater problem severity. The one exception to this is the ASI employment

section. The majority of questions in this area assess the patients assets rather than his/her

problem symptoms. Thus, without any correction, the ASI employment composite

would be a measure of employment strengths with higher scores indicating less severity.

To correct this, thereby increasing homogeneity within the ASI composite scores, we

simply subtract the final values of the employment composite from 1.000.

    For example:

    1.000 - (.204) = .796   1.00 - (.477) = .523

    Clearly, these procedures change the absolute values of the composite scores but

this is not critical since their only true use is in measuring change and showing relative

outcome status between groups. Thus, like factor scores, the actual numeric value has

no intrinsic meaning. Further, these composite measures are not scaled alike, thus they

cannot be compared between problem areas. The actual numeric value of any composite

then, is less important than the relationship of that composite score to the same score

calculated on another group: or on the same group at a different point during or

following treatment.

Questions with Non-Normal Distributions

    A final circumstance which occurs in the employment and legal status composites

concerns the treatment of variables with extreme ranges and non-normal distributions.

For example: "How much money have you made from working/illegal activity in the

past 30 days?" We have seen ranges from 0 to $6000 on answers to these questions and

usually see bimodal distributions. To adjust for this distorted range we have used the log

normal value of the question. This reduces the range and normalizes the distribution.

This value is then divided by the total number of questions in the composite and the

highest log value prior to inclusion.

COMPOSITE SCORE FOR MEDICAL STATUS

This value is determined through a compilation of the answers to three questions. The answer to the first question --

    A. How many days have you experienced medical problems in the last 30? is divided by 30, the highest possible response, yielding the appropriate fraction.

The answers to the next two questions --

    B. How troubled or bothered have you been by these medical problems in the past 30 days?

    C. How important to you now is treatment for these medical problems?

are each divided by 4, the highest possible response. All three answers are then divided by 3.

The score, then, is determined by:

$$A/90 \; + \; B/12 \; + \; C/12$$

COMPOSITE SCORE FOR EMPLOYMENT STATUS

The following four questions are used to determine this composite score.

The answers to two questions --

A. Do you have a valid driver's license?

B. Do you have an automobile available for your use?

are divided by 1.0, the highest answer value.

The answer to the third question --

C. How many days were you paid for working in the past 30?

is divided by 30, the highest answer value.

Questions A, B and C were then each divided by 4, the total number of questions in the composite.

The log of the answer to the last question --

D. How much did you receive from employment (new income) in the past 30 days?

is divided by 4, the total number of questions and 9, the highest log value.

These items are summed and then subtracted from 1.000 to make this score comparable to

the other ASI composites (see Special Circumstances).

The composite score then, is determined by:

$$1.000 \ - \ (A/4 + \ B/4 \ + \ C/120 \ + \ \log \ D/36)$$

COMPOSITE SCORE FOR ALCOHOL USE

Six questions were used in determining this composite score. The answers to three of

the questions --

   A. Days of any alcohol use at all in the past 30 days

   B. Days of alcohol to intoxication in the past 30 days

   C. How many days in the past 30 have you been troubled or bothered by any alcohol
       problems?

       ---are each divided by 30, the number of days, and by 6, the total number of
       questions in the composite.

The answers to two questions --

   D.   How troubled or bothered have you been in the past 30 days by these alcohol
       problems?

   E.   How important to you now is treatment for these problems?

       ---are each divided by 4, the highest scale value. They are also divided by 6 the
       number of questions.

The log of the answer to the sixth question---

F. How much would you say you spent during the past 30 days on alcohol?

       ----is divided by 6, the number of questions and by 7.3, the highest log value.

The composite value is determined, then, by :

$$A/180 +\ B/180\ +\ C/180\ +\ D/24 + E/24 + \log F/44.$$

COMPOSITE SCORE FOR DRUG USE

Thirteen questions are used in determining this composite score.

The answers to 11 questions (past 30 day data only):

    A. Heroin
    B. Methadone
    C. Other opiates/analgesics
    D. Barbiturates
    E. Other sed./hyp./tranq.
    F. Cocaine
    G. Amphetamines
    H. Cannabis
    I. Hallucinogens
    J. # days used more that one drug
    K. How many days in the past 30 have you experienced problems with drug use.

    ---are each divided by 30, the number of possible days, and by 13, the total number of questions used.

Answers to the last 2 questions---

    L. How troubled or bothered have you been in the past 30 days by drug problems?

    M. How important to you now is treatment for these drug problems?

    ---are divided by 4, the highest possible response, and by 13, the number of variables.

    The composite score is determined by:

$$A/390 + B/390 + C/390 + D/390 + E/390 + F/390 + G/390 + H/390 + I/390 + J/390 + K/390 + L/52 + M/52.$$

COMPOSITE SCORE FOR LEGAL STATUS

Five questions are used to determine this composite score.

The answer to the first question---

A. Are you presently awaiting charges, trial, or sentencing? ---is divided by 1,

the   highest value, and by 5, the number of questions used.

The answer to the second question---

B. How many days in the past 30 have you engaged in illegal activity for profit?--

is divided by 5, and also by 30, the highest possible score.

The answers to the third and fourth questions---

C. How serious do you feel your present legal problems are?

D. How important to you now is counseling or referral for these legal problems?

are divided by 5 and also by 4, the highest number on the rating scale.

The log of the fifth questions answer---

E. How much money did you receive from illegal sources in the past 30 days?--

is divided by 5, the number of questions and by 9.2, the highest log value.

The composite score is determined by

$$A/5 + B/150 + C/20 + D/20 + \log E/46$$

COMPOSITE SCORE FOR FAMILY/SOCIAL STATUS

Five questions are used to determine this composite score. The answer to the first question --

A. Are you satisfied with this situation (your current marital situation)? is first recoded (to correct the direction of the answer) in the following way:

0 (no)   = 2

1 (indifferent)   = 1

2 (yes)   = 0

This <u>recoded answer</u> is then divided by 2, the highest response and by 5, the total number of questions used.

The answer to the second question --

B. How many days in the past 30 have you had serious conflicts with your

family? is divided by 30, the highest possible response, and by 5, the number of questions.

The answers to the third and fourth questions --

C. How troubled or bothered have you been in the past 30 days by family

problems?

D. How important to you now is treatment or counseling for family problems?

are each divided by 4, the highest allowable response, and by 5, the number of

questions used.

The fifth variable on which the composite score is based is a ratio obtained from this question --

Have you had <u>significant</u> periods in which you have experienced <u>serious</u> problems in the past 30 days with:

Mother	Other significant family
Father	Close Friends
Brothers/Sisters	Neighbors
Sexual partner / spouse	Co-Workers
Children	

(all answers: 0 = No, 1 = Yes, N = No response or Not applicable)

The ratio used is the number of people with whom the respondent indicated serious problems, divided by the total number of categories responded to. This ration is then divided by 5, the number of questions in the composite.

The score, then, is determined by:

$$A/10 + B/150 + C/20 + D/20 + ratio/5$$

COMPOSITE SCORE FOR PSYCHIATRIC STATUS

Eleven questions are used to determine this composite score. The answers to eight questions indicate any significant period of psychiatric problems during the past 30 days

(0 = No, 1 = Yes).

A. Experienced serious depression?

B. Experienced serious anxiety or tension?

C. Experienced hallucinations?

D. Experienced trouble understanding, concentrating or remembering?

E. Experienced trouble controlling violent behavior?

F. Experienced serious thoughts of suicide?

G. Attempted suicide?

H. Have you taken prescribed medication for any psychological / emotional

problem?

Each of these answers is divided by 1, the highest possible response, and by 11, the total number of questions in the composite.

The answer to the next question:

I. How many days in the past 30 have you experienced these psychological or

emotional problems? is divided by 30, the highest possible response and by 11,

the total number of questions in the composite.

The answers to the last two questions:

        J. How much have you been bothered by these psychological or emotional

        problems in the past 30 days?

        K. How important to you <u>now</u> is treatment for these psychological problems?

        are divided by 4, the highest possible response, and by 11, the number of

        questions.

The score, then, is determined by:

    $A/11 + B/11 + C/11 + D/11 + E/11 + F/11 + G/11 + H/11 + I/330 + J/44 + K/44$

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