**Title: The Barts Explanatory Model Inventory for Dementia: An item reduction approach based on responses from South Asian communities.**

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**ABSTRACT**

**Background.** Cultural differences in how the symptoms, causes, consequences and treatments of dementia are understood and interpreted by South Asian people are a commonly expressed reason for late- or non-use of mental health and care services. However, systematic collection of information on South Asian perceptions of dementia is hindered by a lack of appropriate instrumentation.

**Objectives**. To produce a shortened version of the Barts Explanatory Model Inventory for Dementia (BEMI-D) schedule.

**Methods.** A two stage item reduction approach was employed first using multidimensional scaling categorising items as core, intermediate or outlier. Then, item review was undertaken using three criteria: literature importance, clinical face validity and sub-group prevalence. The analysis followed a non-metric multidimensional scaling method based on a two-way proximity matrix.

**Results.** The original BEMI-D had 197 items allocated to four checklists: symptoms, causes, consequences and treatments. The two stage item reduction approach resulted in the removal of 75 items. These reductions were achieved across all four checklists in relatively equal proportions. There was no evidence of substantive content loss in the revised schedule. The reduced version of the schedule comprises 122 items.

**Conclusions.** A condensed version of the BEMI-D is more efficient as an assessment schedule that captures the culturally diverse perceptions of memory problems for South Asians offering a balanced trade-off between feasibility of use and content validity.

**Keywords**: dementia; ethnic minorities; South Asian; explanatory models; multidimensional scaling

**Key points:**

1. People from South Asian communities are less likely than the general population to access formal psychiatric support for dementia.

2. Understanding how South Asians perceive and interpret dementia, ranging from its symptoms, causes, consequences to its treatments, is crucial in understanding this poor access to support.

3. The only systematic and research-informed tool available to understand perceptions of Dementia in the South Asian Community is the Barts Explanatory Model Inventory for Dementia, but this is a lengthy schedule for practical application (197 items).

4. A novel item reduction approach, combining empirical analysis and expert judgement, reduced the BEMI-D to 122 items in four checklists and is recommended for research and clinical purposes.

***Introduction***

Many Western countries are experiencing growing population diversity. Census data indicate expanding South Asian populations in the UK, USA, Australia and wider afield1,2,3; in the former, people tracing their roots to India, Pakistan or Bangladesh represent the largest of all minority ethnic groupings.3 These demographic changes are presenting new challenges for mental health services in providing appropriate support. Studies indicate that South Asian heritage is a risk factor for common mental disorders relative to general populations4 and vascular dementia associated with higher levels of diabetes mellitus in this community.5,6 However, older South Asians are less likely to receive a psychiatric diagnosis and use proportionately fewer mental health services and treatments than the general population; and tend to access them only when symptoms are more severe.7,8,9,10

Cultural differences in how the symptoms, causes, consequences and treatments of dementia are understood and interpreted by South Asian people are a commonly expressed reason for late- or non-presentation to mental health services. Evidence suggests that knowledge and understanding of objective features of dementia may be weaker in South Asian populations. For example, studies have found that South Asians (compared to the general population) are more likely to attribute dementia as a normal process of ageing, and less likely to recognise the breadth of possible symptoms, including changes in personality and reasoning.11 There is also evidence of pronounced stigma attached to dementia amongst some South Asian communities, including that it may be seen as a weakness of faith, or seen as a punishment for wrongdoing by the individual or their family.12 Consequently, help-seeking behaviour may be compromised by not recognising symptoms; interpreting them as inevitable or untreatable; and/or as being a source of shame. In designing appropriate services, it is therefore crucial for commissioners, managers and clinicians to understand these different interpretations.13 In other disease areas, these ideas have spawned much sociological, anthropological and psychological research into illness perceptions, although in dementia this remains relatively under-investigated.14

The systematic collection of information on South Asian perceptions of dementia is hindered by a lack of appropriate instrumentation. Early research of illness perceptions in minority ethnic groups was largely based on lengthy interviews and post-hoc coding.15 To better suit large sample quantitative research, and with potential value in clinical settings, the Barts Explanatory Model Inventory – Checklist (BEMI-C) was devised as a questionnaire-based tool for examining cultural differences in perceptions and understanding of mental illness.16 This was subsequently adapted specifically for South Asian respondents in relation to dementia: the BEMI-D.17 The BEMI-D is administered through a semi-structured interview, probing for respondent perceptions of four themes: symptoms; causes; consequences; treatments. Each of these individual checklists is then broken down into sub-themes. The interviewer uses a schedule of 197 items – developed from a comprehensive literature review and qualitative research with South Asian elders17 - to identify the range of perceptions arising in the respondent’s narrative.

The BEMI-D has been successfully piloted through exploratory work with 25 South Asian older people17 and was subsequently employed in samples of South Asian older people both with and without dementia, and younger South Asians.18,19 However, some revisions to the schedule are required before it could be recommended for use in wider research or in clinical settings. Specifically, the schedule of 197 items proved lengthy in application, although it may be useful for early pilot work in different contexts and populations. Reducing the schedule nevertheless is no trivial task, since its value is in capturing the breadth of perceptions that are held amongst quantitative samples of South Asian respondents. Thus, an empirical and scientific approach was required.

This paper aims to provide a novel and robust item reduction approach to shorten the BEMI-D to improve its usability in research and clinical settings, but without compromising its breadth of scope.

***Methods***

***Participants***

The 197-item BEMI-D was administered through face-to-face interviews with members of south Asian community in Greater Manchester, England. Two NHS sites (Manchester Mental Health NHS Foundation Trust and Pennine Care NHS Foundation Trust), and two charitable organisations, (LMCP Care Link and the Indian Senior Citizens Centre), were chosen for the recruitment of Indian and Pakistani participants.18 Participants were recruited through memory clinics, community and day centres, flyers and network contacts. The sampling strategy sought participation from four different age groups: 30-59 years old; 60 years old or over with and without memory problems; 60 years old or over with memory problems who had consulted their GP; 60 years old or over with memory problems who had not consulted their GP. Participants defined memory problems through their own personal experience, or someone known to them. For people with no prior familiarity with dementia a case vignette was provided. Interviewers broadly inquired, without specifically stating, about the symptoms, causes, consequences and treatments related to personal experience of memory problems.

The 197-item BEMI-D was collected with supplementary data including information on immigration (age at immigration and number of years in the UK), health (diabetes, heart disease, vision and mobility difficulties), demographic (age, gender, ethnicity, religion) and socio-economic attributes (marital status, living conditions, education, language skills). The BEMI-D was available in three languages English, Gujarati and Urdu. Trained bilingual interviewers visited participants at their home or community centre. Interviewers also measured cognitive impairment and depression by employing the Mini-Mental State Examination (MMSE)20 and the Geriatric Depression Scale (GDS)21. Ethical approval was obtained from NRES (Ref 11/NW/0858).

The sample comprised 160 participants (72 younger adults and 88 older adults with and without memory problems) comprising 89 women and 71 men. A more detailed description of the demographic and socio-economic attributes of the sample is published elsewhere. 18,19 The BEMI-D items were recorded in a binary form, where a score of 1 indicated the presence of an item and 0 indicated absence.

***Item reduction criteria***

Standard item reduction approaches used in measure development, such as Cronbach alphas and factor analytic techniques, were not deemed appropriate for the BEMI-D. This is because the BEMI-D is a checklist, rather than a scale. The item reduction approach blended an empirical analysis of item similarity and outliers with researcher and clinical expert judgement.

The first stage was to identify candidate items for removal or amalgamation such that may be either (i) items that were idiosyncratic with little relationship to the remainder of the inventory; or (ii) items that appeared so similar to other items that it may be regarded as redundant or duplicative. A challenge in applying this criterion was that identifying semantic equivalence or distinction in the wording is subjective and may not appropriately account for nuanced interpretation amongst participants in their original languages. Consequently, an empirical analysis of correspondence between items was employed; a technique called multidimensional scaling (MDS).

MDS is a map visualising technique for two-way proximity (similarity) data. This technique illustrates the relative positions of items derived from a correlation matrix and their level of similarity in a two-dimensional map.22,23 Each point on the map represents one of the items, and the relative position of the items to each other represents their similarity or dissimilarity. Due to the binary nature of the data, the Jaccard binary similarity coefficient was preferred as a similarity measure for the matrix calculation and a non-metric approach was chosen for the MDS. The Jaccard binary similarity coefficient takes values between 0 and 1, where numbers closer to 1 indicate higher levels of similarity and 0 the opposite.24

The utility of MDS for this study is that items located on this map that were far distant from other items could be identified as potentially idiosyncratic and rarely used; whilst those tightly clustered were often used together and might offer items for amalgamation or reduction. To support interpretation, items in each map were partitioned into three groups: outliers; intermediate items and core items. Outliers were rarely used alongside other items in the core group and so may be sufficiently scarce so as to suggest removal; whilst core items were rarely candidates for merging or removal due to redundancy. Intermediate items were all considered on a case-by-case basis. For illustration purposes all the items of the BEMI-D were numbered (Appendix A). The computation of the matrices and MDS was conducted in STATA 14.

The second stage involved reviewing items that were candidates for removal / amalgamation from MDS analysis against the following three retention criteria. First, to be retained the item must correspond to a theme identified as an important symptom, cause, consequence or treatment in Dementia amongst people with South Asian heritage, as identified in the authors’ literature review undertaken for this study.25 The literature review developed and summarised a pathway to care reflecting the work of Goldberg and Huxley26 and the different filters patients may pass through in access to services. There were three filters in the pathway: decisions to consult; health/care problem recognition by services; and referral or uptake of specialist mental health or care services. These were mapped into the four dimensions of symptoms and causes (the first filter); consequences (the second filter) and access to treatment or care services (the third filter). Second, items must have clinical face validity, defined as being recognised as a possible feature of memory impairment encountered in clinical practice with South Asian populations. All items which discriminated between people with memory problems and those without were retained18, 19 . To this end the authors own expertise was accompanied by discussion with an expert consultant old age psychiatrist. Third, retained items must have been endorsed by at least 10 per cent of responses in each sub-theme, so that items rarely found in interviews could be removed (Appendix B). A cut point was needed to exclude items that were very scarce in their use but also a need to ensure that subtle but less common responses were also included. Balancing these concerns and reviewing the frequency distributions led to a decision cut-point of 10 per cent.

**Results**

The process of reduction is summarised in Table 1 and described theme-by-theme below.

*[Table 1]*

***Symptoms***

The symptoms checklist initially comprised 46 items detailed in full in Appendix A. The outcome of the MDS analysis is shown in Figure 1. Eight items were designated as outliers and were all removed after reviewing them against the retention criteria. Of 13 items in the intermediate group, six items were removed. Within the core group, two items were removed and four other items were merged into two items.

Of the 16 removed items and 4 merged items, one was a general symptom, (‘*noticing change in oneself’*). Five removed items were in the somatic symptoms group (‘*visual deficiency*’, ‘*changes or problems in the body or skin*’, ‘*nausea*’, ‘*nerves*’, and ‘*clumsiness*’) and a further two somatic symptoms were merged into one item (‘*fatigue/tiredness’* and ‘*sleepiness*’). Six items were removed from the mental symptoms (‘*deterioration in self-confidence*’, ‘*feeling* *irritable*’, ‘*disillusionment*’, ‘*being frightened*’, ‘*suicidality*’ and ‘*feeling* *guilt*’) and two items (‘*disorientation*’ and ‘*confusion*’) were merged into one item. Four behavioural symptoms were removed (‘*obsessive behaviour*’, ‘*excitability*’, ‘*rambling or talking nonsense*’ and ‘*tobacco use*’). No changes were made to the social life and relationships group. In total the number of items in the checklist was reduced by 39 per cent to just 28 items.

*[Figure 1]*

***Causes***

The causes checklist initially comprised 43 items organised within six sub-themes shown in Table 1. As before, the item reduction process began by reviewing the MDS analysis (see Figure 2) and adjudging items against the three retention criteria. All six outlier items (including 2 zero responses) were removed as they did not satisfy the criteria and seven items were removed from the intermediate region. No items were removed from the core group, but seven items were merged into just three.

These changes were distributed across five of the six sub-themes in the causes checklist. One general cause was removed (‘*personality*’). Three emotional perceptions (‘*self-doubt’*, ‘*guilt or shame*’ and ‘*uncontrolled negative thinking’*) were removed. Five social factors (‘*being abused*’, ‘*racism*’, ‘*inability to talk to others’*, ‘*traditions*’ and ‘*loss of usual environment/people*’) were removed and two other items in this group (‘*life events*’ and ‘*bereavement*’) were merged into one item. Two supernatural causes (‘*weakened spirit*’, ‘*spirits/jins*’) were removed and two other items in this group (‘*fate*’ and ‘*given by God*’) were merged into one item. Two physical health items were removed (‘*virus/germ*’ and ‘*poison*’), and a further three items in this group were merged into one item (‘*medical reasons*’, ‘*illness/bad health or disability or handicap*’ and ‘*heart condition/stroke or Parkinson’s* *disease*’). Overall the causes checklist was reduced by 40 per cent, to just 26 items.

*[Figure 2]*

***Consequences***

The consequences checklist initially comprised 65 items organised in seven different sub-themes; the largest component of the BEMI-D. The MDS results shown in Figure 3 illustrate a large number (n=26) of outlier items. Of these, 18 could be removed, but the remaining eight were retained since they were important factors identified in the literature review. Similarly, only one item in the intermediate group was removed, to preserve content validity. Six items were removed from the core group with two other items being merged into one item.

These removed items were from five of the seven sub-groups. One skills/functioning activity (‘*changes to daily life’*) was removed. Five psychological items (‘*having little* *concentration*’, ‘*changes in* *self-perception/identity*’, ‘*forgetting undesirable things*’, ‘*increasingly* *focus on body/illness*’ and ‘*accepting and dealing with fate/hardship’*) were removed and two items in this group were merged into one item (‘*losing confidence and/or self-esteem*’ and ‘*no motivation and less outgoing’*). Six social roles and relationship items were removed (‘*changes in social life/relationships*’, ‘*ill-treatment*’, ‘*having a* *meaningless existence*’, ‘*continuing with earlier familial/social roles*’, ‘*use of family/friends/social networks as source of help’*, ‘*engagement in roles/ activities that accord status*’). One financial item was removed (‘*losing your job or inability to work’*). The biggest reduction of items was in the behavioural consequences group with 12 of the 21 items being removed including: ‘*becoming extra cautious or on guard*’, ‘*being self-sufficient and independent to cope*’, and ‘*keeping busy or active to cope*’. The removed items were rarely used, possibly because other retained items captured similar and overlapping concepts. Overall the consequences checklist was reduced by 40 per cent to 39 items.

A decision was made to retain ‘*having various safety aids around the home*’ as an adjustment made, despite a low response to this item and it being an outlier, because of its importance to maintaining independence.

*[Figure 3]*

***Treatments***

The final checklist originally had 43 items in seven sub-groups. The MDS results (Figure 4) revealed 13 outlier items of which seven were removed; only one intermediate item was removed; and no core items could be removed based on the retention criteria. However, the overall number of items was reduced through a process of merging those that were conceptually similar.

The item removal and mergers were spread over five of the sub-groups. In the psychological treatments group two items were removed (‘*self-talk*’ and ‘*maximising control* *over inner self*’). In the behavioural treatments category two items were removed (‘*a hot bath*’ and ‘*listening attentively’)*. A further two items in this category were merged into one item (‘*writing things down*’ and ‘*being reminded of things*’). Substantial changes were made in the family and community sub-group, but only three items (‘*others picking up the signs or noticing changes*’, ‘*performance of duties (familial/social/religious)*’ and ‘*engagement in roles/activities that accord status*’) were removed outright. Six other items in this group were merged into two separate items. One of these was in relation to social participation as treatment (‘*talking with family/friends*’, ‘*socialising*’, and ‘*keeping company*’) and one related to family relationships (‘*inclusion in family and household’*, ‘*engaging with family’* and ‘*investing in relationships*’). Further, one spiritual treatment was removed (‘*seeing a traditional healer’*) and two items in medical treatment group were merged into one item in relation to GPs/community nursing support (‘*talking to your GP/Nurse’* and ‘*taking medication’*). The final treatment checklist was reduced by one third to just 29 items.

*[ Figure 4]*

By the conclusion of the reduction process, the new inventory contained 122 items: a reduction of 38 per cent (Appendix C and D). In order to check whether key areas of meaning were lost correlation analysis (using Pearson Correlation) was undertaken comparing the longer and the new shortened versions of the BEMI-D. This was undertaken for: the full schedule value; the individual checklists values; and the individual sub-groups values. Overall the correlation of the full schedule was significant at 0.01 with a score of 0.990. The four checklists were all significant at 0.01 (symptoms 0.976; causes 0.983; consequences 0.977; treatments 0.967). For the sub-groups within the individual four checklists all correlations were also significant (0.01 level) and ranged from 1.000 to 0.864.

The above analysis was then repeated for the younger and older age groups with similar results. Overall full schedule correlation was 0.993 for the younger adults and 0.986 for the older adults. The four checklists all were significant at 0.01 for both younger adults (symptoms 0.981; causes 0.985; consequences 0.974; treatments 0.969) and older adults (symptoms 0.969; causes 0.982; consequences 0.978; treatments 0.965). For the sub-groups within the individual four checklists all correlations were significant (0.01 level) and ranged from 1.000 to 0.870 for younger adults and 1.000 to 0.750 for older adults. These analyses suggest that the schedule has been reduced without a significant loss of capture of meaning and information from the original longer BEMI-D.

**Discussion**

South Asians with dementia are more likely to receive a later diagnosis and less likely to be seen in secondary care services than the White population.27 Ethnic minorities in general may seek help for memory problems later than the White population7 and a study in two Mental Health Trusts in London found that South Asians access services for dementia at a lower age and with a lower score for cognition than members of the White population.10 Rates of dementia diagnosis were also found to be lower for Asian women compared to white women although the reasons for this are currently unclear.28 These are important factors as timely diagnosis and intervention allows access to appropriate medications, support and protection for individuals with dementia, and can reduce carer burden by teaching coping strategies.29 Positive results have been shown in engaging individuals in the early stage of dementia with goal orientated cognitive rehabilitation.30 Early diagnosis also allows time for families and individuals to plan for future needs.31 Thus, understanding and addressing the mechanisms behind this delay is important.

A suggested barrier to gaining appropriate help may be related to both the lack of knowledge of dementia in this community11,25 and/or specific beliefs held regarding symptoms, causes, consequences and treatments. Developing tools to explore illness representations in dementia is therefore important, because of the relationship between these and an individual’s help seeking behaviours.32 Enhanced understanding of dementia appeared to be associated with better outcomes in advanced care planning.33 Although some tools have been developed to explore illness beliefs,14 few address dementia as a health condition34 and these are not specific for ethnic minority communities. Those that have addressed the issue of poorer uptake of services for dementia in this community have focussed specifically on measuring the attitudes towards help-seeking for Dementia.35 The BEMI-D is unique in being designed to elicit the explanatory models for Dementia held by the South Asian community incorporating the wider belief systems held and to collect data in a quantifiable format.

In this study, a reduction process was employed using multidimensional scaling to produce a shortened and more user-friendly schedule while still retaining an appropriate coverage of perceptions. Keeping this breadth of coverage was important to incorporate the wide range of beliefs about dementia held by members of the South Asian community.19 The outcome of this process was to reduce the length of the BEMI-D by over one third. Although the reduction was less than may have been desired, the shortened version (BEMI-Ds) should facilitate the interview process as responses are identified from a list following open questions. The resulting shortened tool may have some utility in: clinical practice; evaluating and targeting information; clinical training; and research but requires further testing of reliability and acceptability in the South Asian population. These issues are explored below.

**Clinical Practice**

Clinically, the schedule might be a useful prompt for clinicians of an individual’s “starting point” 14,36 in their understanding of the condition from the patient’s perspective as part of their care plan. In this way it may assist clinicians to understand patients’ explanatory models to comprehend forms of distress closer to patient experience to ensure a better fit between individual experience of distress, service responses, care pathways and improve adherence by offering more personalised care and treatment. It may also assist in assessment, across cultural boundaries, perhaps reducing the risk of over- or under-diagnosis.16 In addition, it can be the case that different cultural groups have different views about the management of disorders, even to the extent that symptoms are explained in more somatic or more social terms.16

**Targeting/Evaluation Information**

Individual checklists from the BEMI-Ds, such as symptoms and treatments, may be useful in targeting information to increase its acceptability or may also be used as part of an evaluation of dementia awareness programmes in the South Asian community. Such interventions have been shown to be beneficial with other cultural groups.37 Interventions are likely to be more effective if they target causal determinants of behaviour change38 and one study identified the main barrier to change as lack of knowledge.39 Mukadam et al.40 examined the effects of an intervention, in the form of a DVD and leaflet sent via the post, on participant’s intentions to seek help for memory problems. They found a small increase in intentions to seek help in those who engaged with the intervention, although overall engagement with the intervention was low. Similarly, the BEMI-Ds may be used to look at changes in perceptions following interventions.

**Clinical Training**

The schedule could also be employed in professional teaching as part of training in cultural competencies41 to enhance awareness of the range of understandings or beliefs about dementia held by members of the South Asian Community. This is particularly salient as patients’ perceived causes of mental disorders are strong predictors of functional impairment and prognosis in the short term42 and also of help seeking behaviour.32 Similarly, it is important to recognise the supportive quality of certain beliefs in coping with illness43 and the detrimental effects of others such as stigmatisation.

Training in cultural competency is seen as a way of improving patient care44 by more closely aligning the patient’s and doctor’s perspective in health consultations.45 It can lead to improved knowledge, attitudes, skills and patient satisfaction although evidence of improved health outcomes is less clear.46,47 Traditionally methods of teaching cultural competency have been criticised for being too focussed on the learning of generalised rules leading inadvertently to oversimplification and stereotyping.48,49 An ethnographic approach to learning cultural competency is a preferred approach45 along with in-vivo training.13 This recognises that culture is something that the professional also brings to any consultation, that there is a culture within professions and organisations themselves, and that culture is not a static phenomenon.

**Limitations and further work**

The study used a pragmatic approach to item reduction which may be unfamiliar to many researchers. For scale development, more orthodox approaches would use metrics such as Cronbach alpha statistics and factor analysis to identify item clusters and potential redundancy. These options could also be extended to Rasch analysis or non-parametric equivalents such as Mokken scaling. However, the BEMI-D is not a scale, it is a checklist. The use of greater numbers of items on the checklist does not indicate greater severity of dementia, but rather reflects variation in an interpretation and understanding of dementia. Therefore, alternative approaches were necessary. The blended approach, mixing statistical procedures with extant literature and clinical judgement, provides a rigorous and transparent mechanism. However, its pragmatic nature might suggest that further methodological work is needed for item reduction approaches suited to checklists.

The tool was developed with the South Asian population and it would be important to employ it with other groups to elucidate to what extent perceptions were associated with culture, ethnicity, age, education and other social factors. Certainly, there were marked differences within different cohorts in the South Asian population in the present work.18,19 There are several limitations in this study. Firstly, despite a rigorous process the schedule was only reduced by 75 items resulting in what is still quite a lengthy schedule. In addition, the schedule was modified using frequency data from its application in a study in Greater Manchester and has not been tested in other locations or with other South Asian groups which constitute a diverse community in the UK. As perceptions of dementia in South Asians have not been widely researched there is no gold standard for comparison.

Migrant population’s health beliefs and resulting behaviours may change to adapt to a new culture.50 The tool might also be used to capture changes in perceptions of dementia that result from acculturation of minority groups through time. Thus, it can be used to explore variations in the views of different cohorts or in different forms of acculturation within the South Asian community.19,51

Further work could explore the relationship between the perceptions in the four checklists, for example, do symptoms, causes, consequences, treatments cluster together so as to recognise distinct dementia belief groups in the population to whom different responses are appropriate to facilitate their access to treatment and support. The tool could also be used in research to understand more about the illness representations held by the carers of people with dementia which may contribute to future targeted interventions to support caregiving in this community52 and to enhance coping skills.34

**Conclusion**

In this study a multidimensional scaling method was used to produce a shortened version of the BEMI-D which would have more utility in practice. This reduction approach resulted in a shortened version (Appendix C and D) which contains 122 items. The shortening process inevitably constituted a trade-off between feasibility and validity. The items excluded predominantly overlapped with retained items, were rarely used or were more salient to a younger people with psychiatric disorders. Hence, little of relevance to people with memory problems was lost in the shortening process. Despite the limitations described above, the current tool captures the culturally diverse perceptions of dementia. This is particularly important in the South Asian community where presentation for dementia at mainstream services may be later and higher incidence of type 2 diabetes6,53 increases the risk of vascular dementia.54 An understanding of these belief systems may allow better targeting of information and a more personalised approach to care.

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**Table 1. Themes, sub-themes and items within the BEMI-D before and after revision**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Theme** | **Sub-theme** | **# items before** | **# items after** | **Reduction** |
| Symptoms | General | 3 | 2 |  |
| Somatic | 11 | 5 |
| Mental | 18 | 11 |
| Behavioural | 11 | 7 |
| Social | 3 | 3 |
| *Subtotal* |  | *46* | *28* | *39%* |
| Causes | General | 5 | 4 |  |
| Emotions | 5 | 2 |
| Social factors | 12 | 6 |
| Culture / lifestyle | 5 | 5 |
| Supernatural influences | 5 | 2 |
| Physical health | 11 | 7 |
| *Subtotal* |  | *43* | *26* | *40%* |
| Consequences | General | 4 | 4 |  |
| Skills and functioning | 5 | 4 |
| Psychological wellbeing | 12 | 6 |
| Social roles and relationships | 17 | 11 |
| Financial security | 2 | 1 |
| Physical health | 4 | 4 |
| Behaviour | 21 | 9 |
| *Subtotal* |  | *65* | *39* | *40%* |
| Treatments | General | 2 | 2 |  |
| Psychological | 6 | 4 |
| Behavioural and mental | 12 | 9 |
| Family and community | 12 | 5 |
| Formal social support | 2 | 2 |
| Spiritual and alternative | 6 | 5 |
| Medical | 3 | 2 |
| *Subtotal* |  | *43* | *29* | *33%* |
| ***Total*** |  | ***197*** | ***122*** | ***38%*** |

**List of Figure legends**

Figure 1. Symptoms

Figure 2. Causes

Figure 3. Consequences

Figure 4. Treatments

**List of Appendices**

APPENDIX A: NUMBERED CHECKLIST

APPENDIX B: FREQUENCIES

APPENDIX C: BEMI-Ds SCHEDULE (NO MEMORY PROBLEMS)

APPENDIX D: BEMI-Ds SCHEDULE (MEMORY PROBLEMS)