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Emotional and Lifestyle Impact of Type 2 Diabetes:

Exploring the association between diabetes and depression

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SUMMARY

1. Brief description of project

In this pilot project, we explored the impact of disease among people who, in Australia, have a high rate of diabetes, including immigrants from South Asia, people of Chinese descent, Pacific Islanders and Greek Australians. The project was designed to explore:

- lay understandings of the causes of diabetes and depression,
- personal experiences of coping, adjustment, resilience, self-definition, sense of control, issues of loss, in the face of chronic disease and its management,
- life changes and resilience by gender, age and ethno-cultural background that influence adaptation and adjustment,
- the role and nature of social support, social networks and family care giving, and
- the role of medical support in managing depression and diabetes within a diversity framework.

2. Main outcomes / key findings

- People often experience depression with chronic disease, but the nature of its experience, its diagnosis, pathways to care, and attitudes towards illness varied.
- Immigrant background, minority status, gender, experiences with health services, socio-economic status and age all influence understandings and management of diabetes, anxiety and depression
- Our analysis highlights the importance of perceptions of illness danger in influencing mood and response
- Personal and social reactions, including strategic disclosures and concealment of the disease, supportive and intrusive responses, divergent views and conflicts, influence ability of individuals to comply with treatment
- Few people had clinical anxiety or depression, although a larger number had a history of depressed mood. This was always attributed by the sample to personal and interpersonal factors unrelated to physical health status
- People were ambivalent about their GPs ability to provide them with adequate information or with diverse support that would assist with mood disorders.
- Regardless of cultural group membership, the group rated higher than the general population on medium risk for psychological distress. Complications and length of time living with diabetes were key factors related to distress levels for the group as a whole.

3. Implications for policy and practice

- Individuals with diabetes may experience considerable anxiety as they attempt to manage their disease
- Diabetes educators and general practitioners need to be aware of possible depression in individuals with diabetes, although perceived causes of depression may not relate to disease status
- Depending on a variety of personal factors, individuals may have poor access to support services and be reluctant to draw on informal avenues of support.

Introduction

Diabetes is a chronic illness that affects a person living with it on a number of levels - physical, psychological, and social. It involves complex management and almost certain deterioration of health. Living with diabetes involves continuous relationship with a number of health professionals over long period of time. People often experience depression with chronic disease, but the nature of its experience, its diagnosis, pathways to care, and attitudes towards illness all vary according to cultural background. In Australia, immigrants from South Asia, people of Chinese descent, people from Tonga and Samoa, and people from the Mediterranean have particularly high rates of diabetes, and our research concentrated on co-morbidity of diabetes and depression in these groups. An aim of this project was to explore how people understand and experiences both diabetes (and its various co-morbidities) and depression, to gather data that will assist in identifying appropriate services for people with chronic disease. We elucidate for women and men from these groups their understandings of mood variations and the association of this to the diagnosis and development of disease, of diabetes and its management, the life adjustments required, and the ways in which both doctors and family members are seen concurrently as agents of support and control.

Methods

The study was conducted with 30 immigrant men and women living in Melbourne, Australia. Participants were recruited from Chinese, Greek, Indian, and Samoan, Tongan and NZ Maori communities, all of which have a high prevalence of Type 2 diabetes. The aim was to gain insight into the circumstances of living with diabetes. Participants were over 18 years of age and diagnosed with Type 2 diabetes at least five years earlier. Participants were recruited over six consecutive months through collaborations with ethnic community groups and organizations and general practitioners. Potential participants were contacted by RK or, where there were language difficulties, by a bilingual community worker. Interviews were conducted by the first author either in English or with the assistance of an interpreter. By choice Greek participants were interviewed primarily at a Greek community centre, others at their homes. Those who used an interpreter often attempted to communicate directly with the researcher; consequently, interviews often shifted between languages. In most cases a professional interpreter was used, but because of the small size of their communities and concerns about confidentiality, Pacific Islanders preferred a family member as an interpreter. Each interview lasted for one to two hours, was audio-taped, transcribed and translated when conversations were in languages other than English. Additional notes and impressions were recorded at or after each interview.

A structured questionnaire was used to collect socio-demographic data to describe the participants and aspects of their diabetes, with additional scales to measure physical and mental health. For the qualitative data, an interview guide was used to assist free flowing discussion covering diagnosis, change in health, social support, emotional aspects, circumstances and life events and factors believed to influence health. Data collection and analysis were conducted to allow for iteration. Following transcription, we read the transcripts to identify emergent analytical categories. Transcripts were coded and analysed thematically to retain access to participants own categories. As new categories emerged, previously coded data were recoded and reorganised.

Findings – quantitative aspect

Socio-demographic features of the sample

Thirty immigrant men (n=16) and women (n=14) participated in the study: Greek (n=8); Chinese (n=8); Indian (n=7); and, Pacific Islanders (n=7). Socio-demographic details are summarised in Table 1. The overall mean age was 65.43 years (sd. = 11.86) and cultural groups did not differ on age ($F(3, 26) = 1.04$, $p = .392$). Gender distribution did not differ between groups (chi-square (3) < 1.0, $p = .884$). The average length of residency in Australia

was 25.57 years (sd =12.62). Groups differed on length of residency (F (3, 24)= 15.48, p< .001). Post-hoc Scheffe (alpha set as .10) indicated that the Greek participants had migrated to and stayed in Australia for longer (mean= 40.87 years, sd= 5.17) than others (mean= 19.87 years, sd= 8.85), as anticipated given patterns of migration to Australia. Nevertheless, most (89.3%) had lived in Australia for 10 or more years; only two had lived in Australia for less: 3 and 4 years respectively. The majority had come to Australia either for economic reasons (46.7%) or to be re-united with their family (33.3%). Although their reason for migration did not differ between males and females (chi-square (1) < 1.0, p= .680), there was a significant difference between cultural groups on this variable (chi-square (3) = 13.19, p= .004). All Greeks listed economic reasons for their migration, compared with 71.4% of Pacific Islanders and 40% of Indians. All Chinese listed family reunion as their main reason for their migration. Groups did not differ on marital status (chi-square (6) = 9.22, p= .162) and most (80.0%) were married at time of interview. One Greek and one Chinese participant had divorced or separated from their spouse. One Chinese and three Pacific Islanders were widowed. Comparing Pacific Islanders with all other participants suggested that the rate of widowhood in this group was significantly higher (chi-square (3) = 7.17, p= .028).

Participants lived in households occupied on average by 3.83 people (sd = 1.76) and this did not differ between males and females (F(1,28) < 1, p= .456). However cultural groups differed significantly in household size (F(3,26) = 6.38, p= .002) with the main difference (according to post-hoc Scheffe comparisons) being between Greeks (mean= 2.38 people, sd= .916) and Pacific Islanders (mean= 5.57 people, sd= 1.512). Indian and Chinese participants lived in intermediate-sized households of 3.8 people. Although one Indian and one Pacific Islander had at least one parent or parent-in-law living in the same household this did not differ statistically from the Greek and Chinese groups (chi-square (3) = 2.45, p= .485). For 53% of the sample at least one daughter lived in the household and this did not differ across groups (chi-square (3) = 4.10, p= .251). However 85.7% of Pacific Islanders lived in a household with at least one daughter compared with: Greeks, 37.7%, Chinese, 50.0%, and Indians, 42.9%. Sons were also more frequently available in the household of Pacific Islanders and Indians (both 57.1%) compared with Greeks (12.7%) and Chinese (37.5%) but this difference did not achieve statistical significance (chi-square (3) = 4.26, p= .325). There was a trend however for other than the above-discussed classes of people to be living in the same household with Pacific Islander participants (chi-square (3) = 7.26, p= .064). Fifty-seven percent (57.1%) of Pacific Islanders compared with none of the Greeks, 35.5% of the Chinese and 23.3% of the Indians lived with such 'others' in the same household. The presence of a spouse in the household is described above in the description of marital status. Only two participants lived alone (one Greek male and one Indian female).

In the overall sample 30.0% had completed only primary school education and an additional 33.3% completed only partial secondary school. While few (6.7%) had completed only secondary education, some 30.0% completed post-secondary education. Males and females did not differ in level of education but cultural groups did (F(3,26) = 7.31, p= .001). Greeks and Pacific Islanders had received the lowest levels of education, with means indicating them to have completed primary and part secondary school, respectively. The mean for Chinese reflected completion of secondary school while Indians lay between completion of secondary and post-secondary education.

Main lifetime employment type (during their workforce age) also ranged substantially, polarised between 43.4% having worked in unskilled, semi-skilled or skilled labouring compared with 30% having worked in occupations requiring post-secondary qualifications. Overall women (mean= 3.64, sd= 2.79) had lower employment type ranking than men (mean= 5.44, sd= 2.66) but this was not statistically significant (F(1,28) = 3.25, p= .082). As expected from the variation on education, groups differed significantly on lifetime employment type (F(3,26) = 4.49, p= .011). In fact the correlation between education and employment type was .83 (p < .001). Three of the women (one of each from the Chinese, Indian and Pacific Islander groups) reported that they had never worked for payment during their lives. Greeks and Pacific Islanders had mean scores representing skilled labouring while Chinese and Indian scores lay in the range of having operated small to large businesses in the former and large businesses and professional positions in the latter.

Over a third (37.0%) of the sample reported that they were currently in the workforce. The remainder was retired and received a social security pension (for only one of them this was

an invalid pension while the others received the aged pension). In concert with this, age was correlated with 'not working' in the order of .54 (p= .004).

Physical health

The mean duration of diabetes since first diagnosis did not differ between groups (F(3,26) < 1, p= .713). For the overall sample, the mean duration was 17.1 years (sd= 11.21), varying between a mean of 12.71 years (sd = 8.9) for Pacific Islanders and 19.25 years (sd = 12.67) for Greeks. Means for the remaining groups were the same (18.0 years) but there was greater variation in illness duration in the Chinese (sd= 13.47) than the Indian participants (sd= 9.97).

The majority (86.7%) had at least one condition related to diabetes and 76.3% had between one and three conditions, inclusive. Women (mean = 2.29, sd=1.20) tended to nominate more complications than men (mean = 1.44, sd=1.15) but this did not achieve significance (F(1, 28)= 3.88, p=.059). Cultural groups did not differ in the number of conditions experienced (F(3,26)= 2.05, p = .132), ranging from the Greeks who reported an average of 2.5 (sd= 1.60) through to the Indians who reported an average of 1.00 (sd= .58) conditions.

Problems with eyes were most common (63.3%) followed by circulatory (40.0%), heart (26.7%), neuromuscular (36.7%), kidney (6.7%), stroke (6.7%), and foot problems (6.7%). Eye problems was reported significantly more frequently by women (63.3%) than men (43.8%) (chi-square (1) = 5.66, p= .017). None of the other diabetes-related conditions achieved statistical significance (alpha > .05) in relation to gender differences. Eye problems was also the only condition reported as experienced differentially between cultural groups at statistically significant level (chi-square (3) = 9.93, p= .019). The main difference was in the relatively low frequency of such problems in the Indian group (14.3%) compared with the remaining groups (Greeks, 87.5%; Chinese, 75.0%; Pacific Islanders, 71.4%).

The exploration of foot problems and leg pain using the additional scales indicated no differences according to gender (foot problems, F(1, 28)< 1, p=.348; leg pain, F(1, 28)< 1, p=.804) and cultural group membership (foot problems, F(1, 28)< 1, p=.349; leg pain, F(1, 28)< 1, p=.644). For the sample as a whole a mean of 2.50 (sd= 2.31) foot problems (of 10) was reported to have been experienced, or, 63.3% of the sample reported having between one and three problems, 23.4% more than three problems and only 13.3% having no problems. For the whole sample, a mean of 1.10 (sd = 1.09) leg pain problems (of 3) was reported to have been experienced. Sixty percent experienced at least one of the three pain symptoms and 36.6% reported experiencing two or more.

In addition to these problems, 30% of the sample reported blood pressure and 33% cholesterol problems, with no differences between men (blood pressure, 25.0%; cholesterol, 6.3%) women (blood pressure, 35.7%; cholesterol, 28%) at the .05 level of significance. There was no statistically significant difference between cultural groups on these variables (for blood pressure, chi-square (3) < 1 , p= .862; for cholesterol, chi-square (3) = 2.23, p= .526. Total years of living with all complications due to diabetes, together with blood pressure and cholesterol problems, was calculated as a measure of diabetes-related illness burden. Neither gender (F(1,29)< 1, p= .458) nor cultural group membership (F(3,26)= 2,82, p= .063) was systematically associated with this variable. The trend observed in the latter variable reflects the higher mean scores for Greeks (mean= 22.00, sd= 15.47) and Indians (mean= 17.60, sd= 14.05) compared with the Chinese (mean= 8.14, sd= 5.27) and Pacific Islanders (mean= 7.27, sd= 6.39). Grouping the high and low scoring cultural groups into broader groups revealed that Greeks and Indians together did indeed have longer duration of having lived with diabetes-related complications together with blood pressure and cholesterol problems than the remaining two groups (t(unequal variances df, 15.47)= 2.916, p =.01). Cumulative years of having diabetes-associated disorders was not correlated with duration of diabetes (r(25) = .075, p = .714). Nevertheless, taking those experiencing different complications, despite analysis being limited by the small sample sizes, a correlation between duration of diabetes and duration of heart problems was significant (r(6)= .89, p = .008). For eye problems, where a reasonable subgroup had experienced this, there was no correlation between diabetes duration and eye problems duration (r(14) = -.007, p = .981).

Further to these illness conditions, 33.3% of the sample had other somatic illnesses; arthritis and digestive system disorders being the more common amongst these. Neither gender ($F(3,26) < 1$, $p = .576$) nor cultural groups differed on the number of additional conditions ($F(3,26) < 1$, $p = .576$). The majority (80%) of those with any other illness had only one other illness than those listed earlier.

Diabetes self-management behaviours

Table 1 represents the percentages of the overall sample receiving professional advice, understanding the advice and their ratings of adherence to self-management behaviours. Percentages appearing on the left in any column are sample values while those to the right are values incorporating only participants for whom the item applies (e.g., not all participants are used insulin injections or oral medicines). Overall, across items, participants reported having been advised about self-management and treatment with over 80 percent receiving relevant advice. Despite high rates of stating that advice was given some 20 percent lower, overall, reported having complete understanding of what to do in regards to self-management. As indicated under the columns representing adherence with self-management, strict adherence, with the possible exception of medication taking (oral and injections), is more of an exception than the rule, but at least mostly compliant typifies the majority of responses over the items. Close inspection of Table 1 reveals that some 30 percent of the sample falls outside the range of relatively good compliance to self-management behaviours.

Table 1: Information, understanding and self-management adherence.

item	**Advised (& applicable)**[1]	**complete understanding**	**adherence**	
			mostly	strictly
Oral medication	90, 93	70, 78	20, 22	63, 70
Exercise	90, 90	63, 70	40, 40	30, 31
Special diet	100, 100	60, 62	60, 60	17, 17
Responsive eating	80, 83	53, 70	37, 46	27, 33
Blood monitoring	87, 96	63, 70	17, 19	57, 65
Foot care	83, 83	60, 69	33, 37	23, 26
Insulin injections	20, 80	17, 56	0, 0	20, 67

[1] the second value is the percent accounting for not-applicable or missing responses

Gender and cultural group comparisons revealed no difference between these sub-groups on any of the items referring to receiving professional advice. This was also reflected in analysing the overall mean score on 'advised' (for gender, $F(1, 22) = 2.90$, $p = .10$; for cultural group, $F(3, 22) = 2.24$, $p = .11$). The weak (non-significant) trends suggested by the analyses reflect the fact that women scored more highly than men and the Chinese sample scored lower than other groups, and particularly against Pacific Islanders.

Similarly, level of understanding the advice that was received did not differ across items according to gender but for most but one item (blood sugar monitoring, chi-square (3)= 8.39, $p=.039$) score differences approached the .10 level of significance (i.e., trends were evident). The general lack of difference between groups was also reflected in the overall mean score in understanding (for gender, $F(1, 18) < 1$, $p = .96$; for cultural group, $F(3, 22) = 2.08$, $p = .14$). Qualitatively, in examining item percentage breakdowns, for nearly all items (except insulin injections), all or nearly all of the Greek sample claimed complete understanding. Exceptional results were as follows. With respect to injections, 60 percent of Greeks (with affirmative responses to injections) claimed lack of complete understanding of the advice given. For 43 percent of the Chinese sample lack of complete understanding pertained to the item special diet. Among the Indian sample lack of complete understanding was reported regarding the several items: exercise (43%); foot care (43%); special diet (57%); responsive eating (60%); blood sugar monitoring (43%); and, oral medications (29%). In the Pacific Islander group a similar but more extreme picture emerged: exercise (57%); foot care (57%); special diet (57%); responsive eating (50%); blood sugar monitoring (67%); and, oral medications (50%).

Clearly the low sample sizes mean lack of power to be able to detect what appear, qualitatively, to be major knowledge deficits in some of the groups in relation to following the advice given to them by professionals.

With respect to rated adherence to the advice there were no group differences across all items (or mean adherence scores over all items) according to gender and cultural group membership ($p > .05$). Reasonable adherence to exercise (at least several times per week) was evident in 72% of the sample. Comparable values for other items were as follows: foot care, 63%; special diet, 78%; responsive eating, 79%; blood glucose monitoring, 85%; taking oral medication, 93%; using insulin injections, 67%. Conversely, depending on the item, between 37% and 7% did not adhere sufficiently to the self-management behaviours.

The survey also asked participants to provide several global ratings of self-management knowledge and behaviours. In relation to compliance with visiting the doctor most of the sample (93%) reported that they visited 'every time' they had to and the remainder said they visited 'most of the time' they had to. No further analyses were conducted given the highly skewed responses indicating strong compliance with doctor visits across the sample. General ratings of knowledge about self-management behaviours indicated that responses were spread over the categories 'some knowledge' (27%), 'quite a bit of knowledge' (23%) and 'enough knowledge' to follow advice (50%). In relation to ratings of ability to conduct self-management sample responses were spread over the responses 'able to do some things' (20%), 'able to do most things' (53%) and 'able to do all things' (27%). Global perceptions of the success in controlling the diabetes were distributed between 'a little' (20%), 'much' (60%) and 'very much' (20%). With one exception there were no differences according to gender and cultural group membership on global ratings of knowledge, ability to exercise behavioural control and perceived level of control. The exception pertained to the last of these variables where a gender difference was found ($F(1, 21)= 5.72$, $p =.026$) indicative of lower scores among women (mean= 3.25, sd= .683) than men (mean= 2.71, sd= .469).

Participants were also asked about the level of support they had received in relation to self-management by others in their social networks. The majority (60%) reported no support and a small group (7%) that someone helped them sometimes. The remaining 33 percent reported someone helped often (17%) or were almost always helped (17%). While only a tendency ($F(1, 22)= 2.84$, $p =.106$) for males (mean= 1.56, sd= .964) to report having received less support than females (mean= 2.29, sd= 1.383), there was a significant difference between cultural groups in level of support ($F(3, 22)= 4.22$, $p =.017$), based on a two-way analysis of variance. Post-hoc comparisons indicated that Greeks (who scored lowest on support) and Indians scored significantly lower than Pacific Islanders (who scored highest on support). Chinese formed an intermediate scoring group between these and did not differ statistically from each.

Emotional health – Kessler-10 item analysis

Item level analyses were conducted to explore differences in responding on the Kessler-10 between genders and cultural groups. Initial two-way analyses of variance revealed no interaction effects. To maximise power (by increasing the degrees of freedom available) the main effects of gender and cultural group were explored by separate analyses. In relation to gender only one comparison proved significant ($t(27)=2.53$, $p = .018$), with women scoring higher than men on 'felt depressed'. For cultural group membership several outcomes were significant pointing broadly to a higher level of emotional distress in the Greek sample. The following were the specific findings. Significant effects of cultural group were found in relation to: 'felt nervous' (N), $F(3, 26)= 3.64$, $p=.026$; 'so nervous, nothing would calm' (C), $F(3, 26)= 10.25$, $p<.001$; 'restless, could not sit still' (R), $F(3, 26)= 5.10$, $p=.007$; 'felt depressed' (D), $F(3, 25)= 3.29$, $p=.037$; and, 'felt sad' (S), $F(3, 26)= 4.21$, $p=.015$. Post-hoc Scheffe comparisons for item N indicated that Greeks and Pacific Islanders scored significantly higher than the remaining groups. For item C, Greeks scored higher than all other groups. For item R, Greeks and Indians scored higher than the remaining groups, and for items D and S, Greeks scored higher than the Chinese while Indians and Pacific Islanders occupied intermediate positions in their mean scores and were not significantly different from Greeks and Chinese.

Table 2. Percentages of sample subgroups achieving 2/3 (at least 'some of the time') and 3/4 (at least 'most of the time') criteria referring to the frequency of experiencing symptoms of anxiety and depression.

	gender						**Cultural Groups**										**Total**	
Symptom	**men**		**women**		**Statistical Outcome**		**Greek**		**Chinese**		**Indian**		**Pacific Islander**		**Statistical Outcome**		**Total**	
	2/3	**3/4**	**2/3**	**3/4**	**2/3**	**3/4**	**2/3**	**3/4**	**2/3**	**3/4**	**2/3**	**3/4**	**2/3**	**3/4**	**2/3**	**3/4**	**2/3**	**3/4**
Tired	50	25	64	21	ns	ns	50	38	50	25	71	14	57	14	ns	ns	57	23
Nervous	37	12	29	14	ns	ns	63	38	12	0	14	0	43	14	ns	.09	33	13
No calm	19	6	21	7	ns	ns	63	25	13	0	0	0	20	0	**.005**	ns	20	7
Hopeless	13	6	43	7	.06	ns	63	13	0	0	14	0	29	14	**.03**	ns	27	7
Restless	13	7	50	7	**.03**	ns	63	25	0	0	17	0	43	0	**.04**	ns	31	7
Sit still	19	12	21	7	ns	ns	63	25	0	0	14	14	0	0	**.005**	ns	20	10
Depressed	7	7	43	14	**.02**	ns	63	38	0	0	14	0	14	0	**.024**	**.03**	24	10
Effort	31	13	50	14	ns	ns	63	25	25	13	14	0	57	14	ns	ns	40	13
Sad	25	6	50	14	ns	ns	75	25	0	0	29	0	43	14	**.019**	ns	37	10
Worthless	31	6	14	7	ns	ns	38	13	0	0	29	0	29	14	ns	ns	23	7

ns: not significant at the .05 level according to chi-square analysis

Table 2 presents more detailed exploration of group differences by the development of cut-off points along the response scale for each item. Two points are included that distinguish between those experiencing each symptom at least 'some of the time' during the preceding three months from those experiencing ' a little of the time' or more rarely, and, between those experiencing the symptom 'most of the time' or more persistently and those experiencing each symptom 'some of the time' or more rarely. Table 2 describes the distribution of genders and cultural groups in accord with these distinctions. First it is evident from the table (Table 2, last two columns) that symptoms were experienced for at least 'some of the time' in between 20 and 57 percent of the sample. However, persistent symptoms ('most of the time' or more persistently) were rare, ranging between seven and 23 percent of the sample. From the less strict criterion breakdown it is evident that the most common symptoms were tiredness, sadness, experiencing doing things as more effortful, restlessness, and nervousness.

Table 2 also indicates the fact that cultural group differences emerged in the lower part of the response scales that relate frequency of symptom occurrence. That is, overall the majority of the group had experienced mood disturbances of low regularity over the previous three months and group differences emerged at the point of the distinction between rarely experienced and moderately frequent (rather than persistent) symptoms. Moreover it is clear from Table 2 that a higher proportion of the Greek sample was experiencing a wide variety of the depression and anxiety symptoms compared with the remaining groups, confirming the analysis reported earlier.

Emotional health – Kessler-10 risk classification

Total Kessler-10 scores ranged between 10 and 39 (from a possible range of 10 to 50). Australian-based criteria indicate that scores from 10 to 15 reflect 'low or no risk' for an anxiety or depressive disorder, scores between 16 and 29, 'medium risk' and scores of 30 and above 'high risk'. Under this classification, of the overall sample 36.7% were in the low or no risk category, 56.7% in the medium risk, and, 6.7% in the high risk. This is disproportionate against the Australian population (based on the South Australian Health Survey) where the corresponding proportions are 69.0, 28.7 and 2.2 percent. That is, our sample was significantly more likely to have medium to high risk for anxiety and/or depressive disorder than the wider Australian community (chi-square (2)= 17.57, p =.0002).

Two way analysis of variance revealed no effect of gender ($F(1,22)= 1.63$, $p = .215$) but a significant effect of cultural group ($F(3, 22)= 5.36$, $p = .006$). Post-hoc Scheffe contrasts revealed that Greeks (mean= 26.5, sd= 7.82) and Pacific Islanders (mean= 19.57, sd= 6.85) scored significantly higher than the Chinese (mean= 15.00, sd= 3.78), who had the lowest score on the instrument. Indians had slightly higher scores (mean= 17.14, sd= 3.24) than the Chinese but not significantly so. Pacific Islanders scored the next highest and did not differ from the former two groups and the Greeks.

Cross-tabulations of sex by the risk-group variable confirmed the lack of significance between genders in their distribution across risk group categories. Similar analysis for cultural groups also indicated a lack of a significant difference between groups although Greeks were more highly distributed into the higher risk bracket than other groups. The relative percentages of Greeks, Chinese, Indians and Pacific Islanders in the medium risk category were: 62.5, 50.0, 57.1 and 57.1. Only Greeks (25.0% of this group) qualified for the high-risk category. The results show uniformly higher morbidity rates across the cultural groups than may be expected from the Australian general population based on the South Australian Health Survey.

Emotional health – Kessler-10 Anxiety and Depression indices

Further breakdown of psychological distress was sought at the level of syndromes. First, principal components analysis was conducted on the ten items from the Kessler-10. An initial Bartlett Sphericity test indicated a significant result (chi-square(45)= 169.20, $p < .001$) and the Kaiser-Measure of sampling adequacy was high (.71) indicating that factoring the variables in the sample was reasonable (despite the small sample to variables ratio). As might be expected from the Kessler-10 development, items may have been summarised by two latent variables reflecting anxiety and depression. As the two factors are expected to be correlated due to the co-morbidity between depression and anxiety, extracted factors were rotated obliquely to help interpret them.

The results indicated two factors with eigenvalues one or higher, accounting for 65 percent of the variation in the items. Item communalities were reasonably high ranging between .56 and .88 with the exception of the item 'felt tired' (.31). Factor 1 was interpretable as depression with the following primary item loadings: 'everything was an effort, .79, felt sad, .79, felt worthless, .77, felt hopeless, .67, restless/fidgety, .54, and felt tired, .52. Factor 2 was loaded with the following: felt restless/fidgety, .47, so nervous nothing would calm, .92, felt nervous, .77, and restless could not sit still, .75. Thus other than the restless/fidgety item, all other items conformed to their expected loadings on a two-factor model of depression and anxiety, with reasonably simple structure evident in the solution. The two factors were indeed correlated given a priori expectations in the order of .34.

From this analysis it is reasonable to expect a reliable depression index can be computed. We supposed that this could be based on five items, removing the lowest communality item (felt tired) and the ambiguous item (restless/fidgety) based on its face validity and the fact that it appears to 'sit' (load) reasonably between the two factors (therefore this item appears to measure both anxiety and depression). The five provisional items were explored through reliability analysis indicating a Cronbach's alpha coefficient of .83. Inspection of the squared multiple correlations and alpha values if each item were to be deleted indicated that the overall alpha could be improved to a value of .85 if one item was removed ('everything was an effort'). Thus a four-item scale was considered a reasonably reliable measure of depression, including the items 'sad', 'worthless', 'hopeless' and 'depressed'. Similarly, from the factor analysis, there were three high-loading anxiety items that principally defined Factor 2 (anxiety). These, together, through reliability analysis led to an alpha of .79. While one item could be deleted due to its lower squared multiple correlation the improvement in the alpha coefficient was only marginal (.006) and its removal may have led to only two items that may define anxiety too strictly. Thus we settled for the three-item scale as our anxiety index. [Of note, results of factor analysis and reliability analysis of the Kessler-10 conform with theoretical expectations and support the construct validity of this instrument in samples as socio-demographically and culturally diverse as ours.]

Analysis of variance, as before, was used to ascertain gender and cultural group differences on the two new measures. No gender differences were found and none of the interaction terms were significant. Main effects of cultural group were significant for both depression ($F(3, 22)= 3.26$, $p = .041$) and anxiety ($F(3, 22)= 8.17$, $p = .001$)). Post-hoc Scheffe comparisons (alpha= .10) in relation to depression indicated Greeks to have significantly higher scores than Chinese. Indian and Pacific Islander groups scored in the middle and did not differ significantly from either extreme scoring group. For anxiety Greeks outscored all other groups, which did not differ from each other.

Demographic and diabetes correlates of psychological distress

Demographic and illness variables gathered for the sample as a whole were examined for their association with psychological distress as measures by the Kessler-10 instrument. In relation to demographic correlates, age and sex were not significantly correlated with psychological distress (total Kessler-10 score). Immigrants who were more recently arrived reported higher levels of psychological distress ($r(27)= .45$, $p = .016$) and this trend was evident across depression ($r(27)= .36$, $p = .057$) and anxiety ($r(27)= .55$, $p = .003$) scores. Those with a lower education level and occupation status tended to report higher distress although these were not statistically significant at the .05 level (respectively, $r(27)= -.31$, $p = .09$; $r(27)= -.29$, $p = .12$). Analyses of the developed indices for depression and anxiety indicated that education and occupational status were correlated more strongly with anxiety (respectively, $r(27)= -.48$, $p = .007$; $r(27)= -.36$, $p = .052$) than depression ($r(27)= -.30$, $p = .108$; $r(27)= -.29$, $p = .124$). Household size, whether currently working or not, and whether currently married or not were not statistically associated with psychological distress.

In relation to illness variables, total duration of diabetes was significantly correlated with Kessler-10 scores ($r(29)= .39$, $p= .034$). However, total aggregated duration of living with diabetes complications showed only a trend in its relationship with Kessler-10 scores ($r(25)= .33$, $p = .098$). This appeared mainly due to the correlation between anxiety $r(29)= .40$, $p= .044$) rather than depression ($r(29)= .259$, $p= .215$) type items as indicated by the analysis of anxiety and depression indices developed earlier.

Total number of complications was significantly related with Kessler-10 scores ($r(29)= .52$, $p = .004$). Multiple regression analysis indicated a significant model when total duration of diabetes

and total number of complications were entered as predictors ($F(2, 27)= 11.36$, $p < .001$), the model accounting for 42 percent of the variation in Kessler-10 scores (according to Adjusted R^2). The effect of duration of diabetes on psychological distress (Kessler-10 scores) was not mediated by number of complications since both predictors were significant in the model (for total complications, $t=3.90$, $p =.001$; for duration of diabetes, $t= 3.08$, $p =.005$). Since duration of diabetes could be expected to increase with age (though not correlated in this sample), adding age to the model did not remove the effects of diabetes duration or number of complications on Kessler-10 scores; indeed younger age, once the other two variables were controlled in the model, tended to be related independently to higher levels of psychological distress ($p= .054$) and to add to the prediction to the basic two-predictor model (Adjusted $R^2 = .48$).

The contribution to Kessler-10 scores between duration of diabetes and number of complications may be due to different facets that are measured by the Kessler-10. Duration of diabetes was more strongly correlated with depression index scores ($r(29)= .41$, $p= .025$) than anxiety index scores ($r(29)= .26$, $p= .174$) while total complications was more strongly correlated with anxiety than depression index scores (respectively, $r(29)= .49$, $p= .006$, $r(29)= .36$, $p= .052$).

While foot problems in the past three months only tended to be associated with Kessler-10 scores ($r(29)= .34$, $p = .070$) (having a stronger relationship with anxiety, $r(29)= .37$, $p= .042$, than depression), possible presence of peripheral neuropathy as measured by leg pain was significantly correlated with Kessler-10 scores ($r(29)= .40$, $p = .029$) (with a stronger relationship with depression, $r(29)= .33$, $p= .072$, than anxiety). Additional presence of blood pressure and cholesterol problems were not associated with Kessler-10 scores but there was a significant relationship between having other (than diabetes-related) physical illnesses and Kessler-10 scores ($r(29)= .37$, $p = .047$). This relationship was stronger with depression scores ($r(29)= .33$, $p= .076$) than anxiety scores. Unsurprisingly, the sum total of physical illnesses (whether attributable to diabetes or not) was correlated with Kessler-10 scores ($r(29)= .53$, $p = .003$), depression ($r(29)= .45$, $p= .0124$) and anxiety ($r(29)= .42$, $p= .021$) index scores.

Regression analysis indicated a significant model ($F(2, 27)= 6.69$, $p =.006$) that accounted for 28 percent of the variance (based on Adjusted R^2) in Kessler-10 scores, attributable to presence of complications or other illness, and inspection of the predictors indicated that the main prediction was from complications alone ($t=2.83$, $p = .009$). Additional modelling to include the interaction between complications and other illness failed to indicate a significant interaction term ($t<1$) while total complications remained the only significant predictor ($t=2.17$, $p = .039$). Thus presence of other illnesses does not seem to moderate the effect of number of complications nor do other illnesses appear to have an additive effect on Kessler-10 scores.

Among the complications two (of seven) were positively correlated with Kessler-10 scores and these were: eye problems ($r(29)= .49$, $p = .007$) and foot problems ($r(29)= .63$, $p < .000$). These were based on measures of presence of such conditions not necessarily restricted to the last three months (cf. analysis results presented earlier).

On the relationship between self-management and psychological distress

In relation to self-management scores, correlations analysis failed to detect any relationships between Kessler-10 scores and level of advice, knowledge or adherence. Item level analyses indicated some association between the item 'felt nervous' and higher scores on advice ($r(29)= .43$, $p < .018$), knowledge ($r(29)= .36$, $p < .073$) or adherence ($r(29)= .44$, $p < .026$) but this did not carry over to the other anxiety items. Of interest three of four items composing the depression index (developed above) had negative correlations with adherence but these were not statistically significant at the .05 level. As said while 'nervousness' tended to be positively correlated the two items regarding 'restlessness', were, like depression items, negatively associated with adherence (the stronger correlation being for the item 'restless, could not sit still' ($r(29)= -.36$, $p = .071$).

Analysis of global ratings of knowledge and adherence indicated no associations between knowledge and various psychological distress measures. On the other hand, lowered perceptions of ability to carry out control behaviours regarding the diabetes was related to higher Kessler-10 scores ($r(29)= -.35$, $p = .056$), membership in the higher risk for psychological disorder categories ($r(29)= -.37$, $p = .045$) and the depression index score ($r(29)= -.43$, $p = .017$). Anxiety index scores were not related with perceived control ability. The main Kessler-10 items contributing to these correlations were 'felt hopeless' ($r(29)= -.43$, $p = .018$), felt restless/fidgety ($r(29)= -.35$, $p = .062$),

'restless/could not sit still' (r(29)= -.30, p = .111), and 'felt worthless' (r(29)= -.42, p = .020). Anxiety index scores (which focus on nervousness) per se were not correlated with ability to conduct control behaviours.

Perceptions of the ability to have had reasonable control (as an outcome of their efforts) of the diabetes were not significantly correlated the broad indices of psychological distress although some of the Kessler-10 items tended to be related to this: felt tired (r(29)= -.39, p = .032); felt hopeless (r(29)= -.32, p = .082); and, felt sad (r(29)= -.32, p = .085). Lastly, there was no relationship between psychological distress measures and level of perceived support from the social network in managing the diabetes (either in analysing general or specific item scores).

Links between cultural group membership and other factors

The above presents a complex set of findings, most problematic being the confounding of cultural group membership on the relationship between background factors and mental distress. To simplify understanding, four cultural group membership binary variables were computed defining membership in the Greek, Chinese, Indian and Pacific Islander groups, versus membership outside of these, and correlations were computed with all other main factors. Tables 3-8 summarise the emergent picture. Note that a significant correlation in one group means that there are significantly higher or lower scores for that group than others. Sometimes this will be reflected in a significant correlation in the opposite direction for another group(s) for the same variable. If this is the case, this means that scores on that variable stand in particular contrast for the groups involved (for example in Table 3, the Greek group membership is associated with lower education compared with other groups, AND, particularly when compared with Indians who tend to have higher education than all others.)

Table 3. Demographic factors

	IS_GRK	IS_CHI	IS_IND	IS_PAC
AGE	0.178	0.191	-0.203	-0.183
SEX	0.04	-0.111	-0.042	0.116
years in oz	**0.781**	-0.118	**-0.383**	*-0.353*
education level	**-0.54**	0.292	**0.448**	-0.189
WORK_TYPE	**-0.375**	0.277	**0.392**	-0.29
WORK_CUR	**0.546**	0	**-0.414**	-0.164
household size	**-0.507**	-0.029	0.008	**0.553**
binary marital status	-0.113	0.075	-0.276	*0.315*

Bolded= statistically significant; italics= trend; IS_GRK = is Greek, and so on.

Table 4. Illness factors

	IS_GRK	IS_CHI	IS_IND	IS_PAC
years with diabetes	0.118	0.049	0.045	-0.219
foot problems	0.143	0.071	-0.205	-0.019
calve & thigh pain	0.154	0.014	-0.271	0.095
Complications	*0.331*	0.021	**-0.379**	0.011
blood pressure &	0.03	0.03	-0.031	-0.031

cholesterol				
other illnesses	0.164	-0.082	0.128	-0.214
total illnesses	*0.309*	-0.016	-0.196	-0.111
years with complications & BP cholesterol	**0.433**	-0.29	0.142	-0.301
effort on illnesses	**0.38**	0.024	*-0.304*	-0.118

Table 5. Kessler-10 items

	IS_GRK	IS_CHI	IS_IND	IS_PAC
tired	0.047	-0.164	0.098	0.024
nervous	**0.51**	-0.299	-0.226	0.005
nervous unable to calm	**0.71**	-0.085	**-0.369**	-0.285
hopeless	**0.354**	*-0.339*	-0.129	0.113
Restless fidgety	**0.374**	**-0.401**	-0.032	0.059
Restless not sit still	**0.572**	**-0.398**	-0.052	-0.13
depressed	**0.489**	*-0.340*	0.000	-0.17
everything an effort	0.247	-0.009	*-0.325*	0.076
sad	**0.522**	**-0.392**	-0.137	0
worthless	0.186	-0.279	-0.073	0.17

Table 6. Self-management

	IS_GRK	IS_CHI	IS_IND	IS_PAC
ADVISED	-0.023	**-0.405**	0.127	*0.321*
Understood	0.244	0.303	-0.234	-0.304
ADHERE	0.044	0.182	-0.149	-0.061
doctor visits	0.168	0.168	-0.197	-0.164
knowledge gl	-0.077	0.012	0.221	-0.153
behavioural control gl	0.052	0.273	0.062	**-0.402**
control success gl	0	0.119	0	-0.125
supported gl	*-0.329*	-0.076	-0.152	**0.575**

gl glucose

Table 7. General psychological morbidity indices

	IS_GRK	IS_CHI	IS_IND	IS_PAC
SUM_K10	**0.593**	**-0.400**	-0.197	-0.005
N_DEP	**0.471**	**-0.415**	-0.099	0.04
N_ANX	**0.706**	**-0.314**	-0.252	-0.158
K-10 CRUFAD	**0.437**	-0.206	-0.121	-0.121

Table 8- Kessler-10 item breakdown

	IS_GRK	IS_CHI	IS_IND	IS_PAC
tired	0.047	-0.164	0.098	0.024
nervous	**0.51**	-0.299	-0.226	0.005
nervous unable to calm	**0.71**	-0.085	**-0.369**	-0.285
hopeless	**0.354**	*-0.339*	-0.129	0.113
restless fidgety	**0.374**	**-0.401**	-0.032	0.059
restless not sit still	**0.572**	**-0.398**	-0.052	-0.13
depressed	**0.489**	*-0.340*	0.000	-0.17
everything an effort	0.247	-0.009	*-0.325*	0.076
sad	**0.522**	**-0.392**	-0.137	0
worthless	0.186	-0.279	-0.073	0.17

Table 4 summarises the demographic contrasts reported earlier and need not be repeated here. Table 5 shows that illness variables were generally not different between groups with the exception of Greeks reporting more years living with complications, high blood pressure and cholesterol problems, and expending greater effort dealing with physical disease than other groups. Table 6 indicates a fairly uniform picture between groups in relation to diabetes self-management issues with the exception that Pacific Islanders tended to report less behavioural control of diabetes and more support to manage it that other groups. Table 7 shows clearly that the Greek sub-sample were more likely to have scored in the higher of the range of psychological distress, particularly contrasting with the Chinese, while Table 8 shows the uniformity of this result across specific Kessler-10 symptoms.

Predictors of psychological distress

A final set of analyses were focused on looking at the multiple prediction of psychological distress in the sample using multiple regression. In view of the small sample predictors had to be kept to the minimal and they were selected based on the observed correlations indicated in the previous analyses. These were: duration of diabetes, total number of complications, age (as indicated to be useful from the regression analyses presented earlier), length of residency in Australia, total aggregated years in living with diabetes complications, effort expended in dealing with physical illness, and education level.

The first analysis focused on the total Kessler-10 score. Predictors were entered together and reduced in set by backward elimination. The final model retained four predictors, which explained 53.5 percent of the variance in Kessler-10 scores. There was only 2% of (unadjusted) variance difference between having all the predictors and the four-predictor model. Needless to say that model was significant ($F(4, 25) = 9.35$, $p< .001$). The main independent predictors were: total number of complications ($t= 4.12$, $p <.001$), duration of diabetes ($t= 3.21$, $p <.004$), age ($t= 2.57$, $p <.017$), and length of residency in Australia ($t= 2.07$, $p <.049$). Directions of effects were positive with the exception of age (i.e., as indicated earlier, younger age was related to higher distress scores).

The analysis was repeated by entering three of the four dummy variables related to cultural group membership (being Greek, Chinese and Indian) (exclusion of fourth cultural membership variable is on the basis that the three membership categories already explain the variance attributable to the fourth). The main reason for this analysis was to explore whether the predictors of Kessler-10 scores demonstrated above simply reflected the confounding effect of cultural group membership. In fact, the final model in this analysis retained all but the length of residency in Australia variable and in addition to the other three predictors included Greek and Chinese group membership. The final model was significant ($F(5, 22)= 14.51$, $p < .001$), accounting for 70 percent (!) of the variation in Kessler-10 scores in the sample based on the Adjusted R^2 estimate. The predictors were: total number of complications ($t= 4.61$, $p <.001$), duration of diabetes ($t= 4.44$, $p <.001$), age ($t= 2.31$, $p <.030$), Greek group membership ($t= 2.57$, $p <.017$), and Chinese group membership ($t= 2.36$, $p < .027$). Directions of effects were positive with the exception of age and Chinese group membership (i.e., older age and Chinese group membership was related to lower Kessler-10 scores). Most importantly then, number of complications and duration of diabetes on psychological distress do not appear to be due to the possible confounding of cultural group membership with these variables. A similar analysis was conducted replacing Indian and Pacific Islander group membership with essentially the same substantive outcome.

Next, the analysis was repeated replacing the dependent variable to be the depression index. There were indications earlier in the correlation analyses that depression and anxiety scores did not co-vary entirely with the same 'other' factors. Backward elimination removed the majority of the variables leaving only two significant predictors of depression index score: total number of complications ($t= 2.51$, $p = .019$) and duration of diabetes ($t= 2.79$, $p = .009$). The two-predictor model was significant ($F(2, 27)= 6.44$, $p =.005$) accounting for 27 percent of the variance (based on Adjusted R^2) in depression index scores. Entering cultural groups into the analysis, as before, did not eliminate the effects of number of complications ($t=3.01$, $p=.006$) or diabetes duration ($t=3.42$, $p = .002$). Membership of Chinese group was indeed an independent and negative predictor along side these ($t=3.29$, $p= .003$). The model led to a substantial increase in the variance accounted for (Adjusted $R^2 = .47$, or 47%) and was significant ($F(3, 26)= 9.46$, $p < .001$). Of note before Greek and Indian or Pacific Islander group membership were eliminated from the predictor set their presence did not influence the size and significance of the standardised regression coefficients (beta) for duration of diabetes and total number of complications – suggesting cultural group membership did not mediate the relationship between depression index scores and, in turn, diabetes duration and total complications.

Similar analysis of anxiety index scores indicated a significant four-predictor model ($F(4, 25)= 8,03$, $p < .001$) accounting for 49 percent of the variation in scores. The four predictors were: total number of complications ($t=2.77$, $p = .010$), age ($t=2.29$, $p = .031$), length of residency in Australia ($t=2.79$, $p = .01$), and education level ($t=1.91$, $p = .068$). Notably duration of diabetes was not a predictor of anxiety in this model. Adding the cultural group membership variables changed this model with duration of diabetes now being retained as a significant predictor ($t= 2.47$, $p = .020$) together with total number of complications ($t= 3.15$, $p = .004$), age ($t= 2.35$, $p = .027$), and Greek group membership ($t= 4.95$, $p < .001$) (eliminating length of stay in Australia which was noted to be

a correlate of Greek group membership). This model, which was significant ($F(4,25)= 13.81$, $p < .001$), accounted for 64 percent of the variation in anxiety scores.

In sum – quantitative and qualitative aspects of the study

Generally, from the quantitative analysis, it appears that total complications and duration of diabetes are important predictors of psychological distress in this sample, and not confounded by the differences between cultural groups on the other variables explored. In fact, Greek group membership contributed to the models of distress towards higher distress scores while it was the opposite case for Chinese group membership.

While complications could be understood to 'upset' people and the more of them the more 'upset' they may cause, there is an additional effect of duration of diabetes. The longer the duration the greater the distress – this would mean that depression and anxiety is not simply linked to initial adjustment problems to having diabetes but it is not clear from this component of the study why people with longer duration of diabetes seem to be more depressed and anxious. Factors such as age, education (and occupational status, which was not included in the regression analyses due to its .81 correlation with education), and the perceived effort expended on dealing with all chronic conditions were not found to be predictors of distress in this group in the presence of the effects of complications and diabetes duration.

It is important to keep in mind that despite the high proportions of variance explained by the models in this sample, such strengths of prediction may not carry over to other groups. This sample could be highly biased given its size and origin of recruitment.

The emerging qualitative findings indicate a more complex process in terms of the links of physical and mental co-morbidities than suggested in the literature. Depressive mood is often attributed by diabetics not to the impact of disease but to adversities and difficult life circumstances, as it is by others, except when complications progressed, despite good adherence to self-management. Positive health perceptions, usually considered a good attribute linked to optimism and sense of control in the face of disease processes, lowered adherence to self-management for glycemic control, and lack of perceived health threat led to low motivation to engage in preventive behaviours. Many in the sample believed that worry and associated low mood was an important cause rather than a consequence of diabetes, and our data do not clarify whether negative mood affects self-management. Mood disturbances were rarely attributed to the diabetes except when complications developed. In uncomplicated diabetes, therefore, there appears to be discontinuity between the stated importance of diabetes and its impact on daily life and descriptions of daily efforts and behaviours.

Few cultural differences in knowledge and explanatory models of diabetes and its complications are evident, but strong emergent differences in attitudes towards self-management. Greek participants, for instance, regarded diabetes as relatively unimportant and exhibit less strict attitudes than others; Chinese respondents especially regarded their doctor as their main confidant and the key source for help with their condition, including emotional aspects. They expressed a greater sense of acceptance and control over their condition, and showed greater conformity with medical advice than others. Personal, social, psychological, cultural, illness and treatment factors all appear to inter-relate with respect to the disease and to mood.

The first paper, "Care and control: immigrant women living with Type 2 diabetes in Australia" (*Anthropology and Medicine*; in press; see Attachment 2) illustrates how women and their social network understand medical advice and reconfigure their interactions in adjusting to the disease. Social interactions vary and inform women's adjustments to, communication of and social responses to diabetes. Understanding the social context of the management of diabetes may be important in addressing non-adherence to treatment.

A second paper, under completion at time of writing, to be submitted to *Diabetes Care*, is entitled "I can't wish it away:" Clinical encounters and message framing for immigrant Australians with diabetes." This paper draws on research data and explores factors that influence self-management. In Australia, diabetes is the most often diagnosed and managed in a general practice setting. Given the nature and seriousness of this condition, how initial diagnosis is framed and communicated by medical professionals to a 'patient', and how the prognosis is articulated is of crucial importance. It is important for the patient to understand the nature of the disease, to gain

their long-term commitment to a controlled, in many ways restricted life, and to accept a change of self-identity and the roles they performed prior to diabetes. Of importance is an on ongoing, good-quality relationship between clinicians and their patients, which is known to increase positive outcomes in the management of any disease, including diabetes. What patients are told, their reaction to such information and ideas about “good” and ‘bad” doctors inform their ability to manage their disease, their psychological responses, and the presence or absence of anxiety and depression. Most Australian patients know how to prevent complications but do not necessary adhere to advice, perhaps due to illness and treatment beliefs and attitudes, competing life priorities, and circumstances, and lack of sufficient knowledge and are subject to cultural variation. Motivation for self-management adherence may be weathered away by emotional processes, although some people show remarkable resilience, linked to optimism, problem-focused coping and self-efficacy beliefs regarding the controllability of the disease. We examine how such contexts are incorporated and examine how the relationship between doctors and their patients influences their reaction to diagnosis and ongoing management.

In addition, we have published two papers for a general audience:

MANDERSON, L, Kokanovic, R. and Klimidis, S. 2005. Exploring the links between depression and diabetes in a multicultural context. *Diabetes Educators Association Magazine* 8, 2: 11-13.

MANDERSON, L, Kokanovic, R. and Klimidis, S. 2005. Experiences of diabetes and depression in diverse Australian populations. *PARC Newsletter (Primary Mental Health Care Australian Resource Centre)* 2. 6: 13-14.