Does the AUSDRISK tool predict perceived risk of developing diabetes and likelihood of lifestyle change?

Catherine R Ikin, Marie L Caltabiano

Type 2 diabetes prevention measures that include early detection through screening are imperative in stemming the rising prevalence of the condition. The aim of this study was to examine perceived risk for developing diabetes in light of an actual risk in an undiagnosed population using the AUSDRISK scale. A cross-sectional sample of students and staff at a university campus took part in a repeated measures assessment of percieved diabetes risk intersected with an actual diabetes risk assessment. Participants also indicated the likelihood of lifestyle changes subsequent to risk assessment.

Type 2 diabetes is now recognised as one of the most significant global health problems of the 21st Century. The Australian Type 2 Diabetes Risk Assessment Tool (AUSDRISK; Australian Government Department of Health and Ageing, 2008) was developed was developed by the Baker IDI Heart and Diabetes Institute on behalf of Australian governments to identify people in Australia at high-risk of diabetes. In this study, a cross-sectional sample of people at a university were invited to complete the AUDRISK scale to determine actual diabetes risk and the Risk Perception Survey for Developing Diabetes (RPS-DD) scale to determine their perception of risk, as well as the likelihood of making lifestyle changes based on their risk assessment.

AUSDRISK scale

The AUSDRISK is a 10-item instrument that can be self-administered or completed with the assistance of a health professional (Department of Health Australia, 2008). The risk assessment considers modifiable factors (e.g. medication for blood pressure, smoking, fruit and vegetable intake, level of physical activity and waist circumference) and non-modifiable risk factors (e.g. age, gender, ethnicity, family history of diabetes and personal history of high blood glucose) to calculate an actual risk score for developing diabetes in the next 5 years. Item responses are scored using a points system, with scores ranging from 0–38. Scores of ≤5 correspond to low-risk, scores of 6–11 as intermediate, and ≥12 as high-risk of developing type 2 diabetes. The AUSDRISK has been available since 2008, yet despite its ease of administration it is reported as being underutilised by GPs (Wong et al, 2011). Also, it is unclear whether individuals who self-administer the AUSDRISK change their perceived risk for developing type 2 diabetes or follow through with the behavioural recommendations offered on the tool.

RPS-DD

The RPS-DD was developed to capture the multidimensional nature of perceived disease risk and measures personal control, optimistic bias, comparative disease risk, comparative environmental risk and diabetes knowledge and worry (Walker et al, 2003). The RPS-DD

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Article points

1. AUSDRISK is a diabetes actual risk identification tool.
2. The AUSDRISK assessment tool may reduce optimistic bias in perceived risk of developing type 2 diabetes, providing a more realistic assessment of risk, essential for intention to make lifestyle changes.

Key words

- Actual risk
- AUSDRISK
- Perceived risk
- Prevention

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Page points

1. The Health Belief Model is one of the most widely used explanatory frameworks for predicting the likelihood of behavioural lifestyle changes in disease prevention research.
2. A cross-sectional sample of a students and staff at a university campus took part in a repeated measures assessment of perceived risk and actual risk of developing diabetes.

aims to capture multiple dimensions of perceived risk for developing diabetes (Walker and Wylie-Rosett, 1998). Individuals who are less pessimistic and feel a sense of control are less likely to feel at risk of developing diabetes (Walker et al, 2003; Pinelli et al, 2009). Gender differences in risk perception have been found, with women reporting greater levels of perceived risk, worry and personal control, and men being less likely to take early action about health risks (Aoun et al, 2002; Hivert et al, 2009).

There are 32 items (alpha=0.83) with responses that are scored on a 4-point Likert scale. An additional 11 items represent the Diabetes Risk Knowledge and these items are summed for the number of correct responses. Two subscales from the RPS-DD were used in the study. A high score on the Personal Control subscale (four items; alpha=0.71) indicates greater perceived personal control over developing diabetes. For the Optimistic Bias subscale (two items; alpha=0.74) a high score indicates greater perceived risk, or less optimistic bias.

Likelihood of change

The Health Belief Model (HBM) is one of the most widely used explanatory frameworks for predicting the likelihood of behavioural lifestyle changes in disease prevention research (Carpenter, 2010). The HBM suggests behaviour change is determined by perceptions of susceptibility and seriousness of a health risk taking into account non-modifiable factors (e.g. gender, age); psychological factors (e.g. optimistic bias, perceived control); structural factors (e.g. disease knowledge) and the ratio of perceived barriers to benefits of any change (Rosenstock et al, 1988; Carpenter, 2010). Preventive behaviour has been described as any action taken by an individual, believing him or herself to be healthy, while not experiencing any symptoms in order to prevent or detect disease (Kasl and Cob, 1966). This definition underpins the message in global calls for prevention strategies that target not only type 2 diabetes but also a range of non-communicable diseases (Wang et al, 2009).

Planned Lifestyle Changes

To assess likelihood to change, a Planned Lifestyle Changes questionnaire was developed for the current study. There are six items with a 5-point Likert response, ranging from 1 "very likely" to 5 "very unlikely" and all items are reverse scored. The questionnaire is intended to determine whether individuals plan health behaviour change as a consequence of information and knowledge gained through actual risk assessment. Items address seeking further information, talking with others, and modifying eating, drinking and smoking. A Cronbach's alpha of 0.72 supports reliability of this questionnaire.

Study

A cross-sectional sample of a students and staff at a university campus took part in a repeated measures assessment of perceived risk and actual risk of developing diabetes. The aims were as follows:

1. To assess the utility of the AUSDRISK in an undiagnosed population through an exploration of both actual risk and perceived risk of developing diabetes.
2. To add to existing knowledge of perceived risk as a multi-dimensional construct.
3. To add to knowledge utilised by professionals in the field of diabetes prevention strategies through an examination of likelihood of lifestyle changes.

Hypotheses

1. It is expected that the AUSDRISK will identify participants at high-risk of developing diabetes, thus adding to its general application.
2. It is anticipated that there will be changes in perceived risk after completing the AUSDRISK.
3. From the HBM, it is hypothesised that perceived risk of developing diabetes will be determined by actual risk, optimistic bias, perceived control and diabetes knowledge.
4. Using the HBM framework, it is anticipated that intention to make lifestyle changes will be predicted by the independent variables actual risk (AUSDRISK), and perceived risk.

Methods

Participants

Participants were staff and students recruited from a regional Australian university. Eligibility criteria included a minimum age of 18 years and no type 2 diabetes diagnosis.

Procedure

The study was approved by the Human Research Ethics Committee at James Cook University and informed consent was obtained from all participants. All surveys were conducted on an individual face-to-face basis with a researcher during one session. The participants first completed the RPS-DD (Time 1), then the AUSDRISK. They were provided with an objective explanation of its purpose and asked to read all information regarding diabetes prevention provided within the tool. A measuring tape was provided to collect waist circumference. The researcher collaborated with participants to total and record their score and ensure they were aware of their risk level. At this point participants' anxiety levels were checked before continuing. The next step involved a repeat administration of the RPS-DD (Time 2), followed by the Planned Lifestyle Changes questionnaire. Debriefing included a check on anxiety, providing AUSDRISK score information and recommendations. Specific information was provided for each risk level including recommendations for improving lifestyle, consulting with a doctor to discuss the result and the possibility of undiagnosed diabetes with a recommendation for further medical tests. Information on available medical and well-being support services was also provided.

To estimate the proportion of variance in perceived risk at Time 2 (post-AUSDRISK) that can be accounted for by the four predictor variables (high-risk AUSDRISK score, personal control, optimistic bias and diabetes risk knowledge), a multiple regression analysis was performed.

Results

The total number of participants was 97 (32 male and 65 female), which was determined as a sufficient sample size based on analysis of Power using the computer program G*Power (V.3.1.9) (Faul et al, 2007). Sixty-five participants were aged less than 35 years, and 32 participants were over the age of 35 years.

Table 1. Participant demographic according to the AUSDRISK score results.

	Low risk		Intermediate risk		High risk		Total	
	N	%	*N*	%	*N*	%	*N*	%
Total sample	45	46.4	30	30.9	22	22.7	97	100
Gender								
Male	13	40.6	10	31.3	9	28.1	32	100
Female	32	49.2	20	30.8	13	20.0	65	100
Age								
Less than 35 years	42	64.6	18	27.7	5	7.7	65	100
35–44 years	1	7.7	5	38.5	7	53.8	13	100
45–54 years	2	16.7	5	41.7	5	41.7	12	100
55–64 years	0	0.0	2	28.6	5	71.4	7	100
Ethnicity								
ATSI, Asian, Other	6	31.6	6	31.6	7	36.8	19	100
Australian	39	50.0	24	30.8	15	19.2	18	100

ATSI=Aboriginal and Torres Strait Islander.

In total, 22.7% (*n*=22) of the sample were at high-risk of developing diabetes in the next 5 years according to the AUSDRISK scale (see *Table 1*). There was a relatively even distribution of high scores across the older age groups, with the 35–44 year age group most at risk. Overall, a greater proportion of participants with a high diabetes risk score were male.

Following the AUSDRISK assessment, there was a significant change in perceived risk in the low-risk and high-risk groups. Relative to their Time 1 perceived risk score, 33 participants in the low-risk group reduced their perception of risk, while 16 participants in the high-risk category increased their perception of risk after completing the AUSDRISK. There was no significant change in perceived risk scores for participants in the intermediate-risk category. Descriptive statistics for perceived risk changes are shown in *Figure 1*.

Table 2 presents the regression analysis predicting perceived risk of developing diabetes

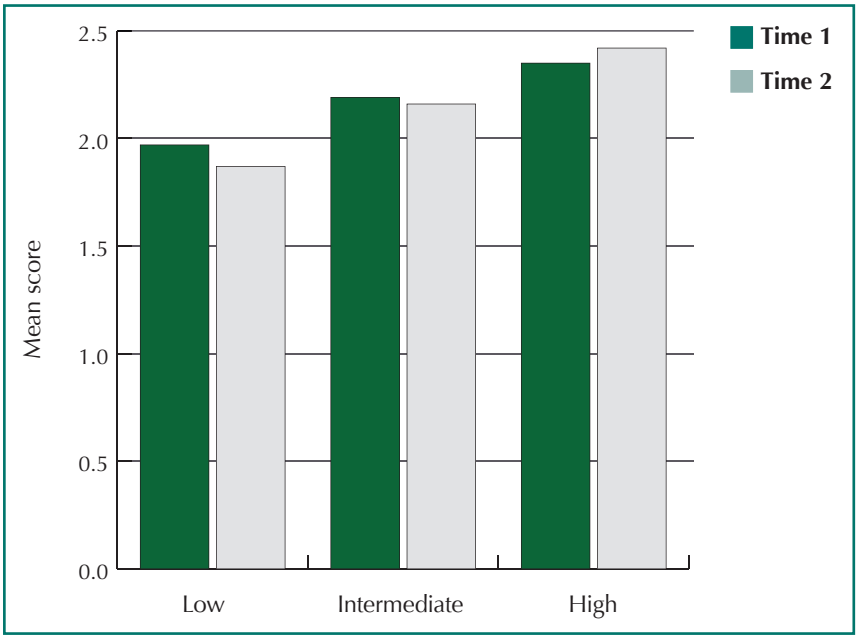

Figure 1. Mean perceived risk score before and after the AUSDRISK actual risk assessment for people at low, intermediate and high risk of diabetes, according to the AUSDRISK assessment.

Table 2. Results from regression analysis predicting perceived risk of developing diabetes at Time 2.

Predictors	B	Beta	95% confidence interval	*t*	*p*
High AUSDRISK score	0.256	0.254	[0.09, 0.42]	3.059	0.003
Personal control	-0.057	-0.062	[-0.21, 0.09]	-0.759	ns
Optimistic bias	-0.327	-0.549	[-0.42, -0.23]	-6.87	<0.0001
Diabetes risk knowledge	-0.019	-0.060	[-0.06, 0.03]	-0.79	ns

ns=non-significant.

Table 3. Results from regression analysis predicting intention to make lifestyle changes from actual AUSDRISK and perceived risk at Time 2.

Predictors	B	Beta	95% confidence interval	*t*	*p*
High AUSDRISK score	0.949	0.073	[-1.81, 3.71]	0.683	ns
Perceived risk at Time 2	4.35	0.335	[1.61, 7.01]	3.15	0.002

ns=non-significant.

at Time 2 for the four predictors: actual risk, personal control, optimistic bias and diabetes risk knowledge. The predictor variables for perceived risk of developing diabetes accounted for a significant 69.3% of the variability in perceived risk of developing diabetes. Optimistic bias and actual risk were significant predictors of perceived risk at Time 2. Those participants with higher scores on the AUSDRISK were more likely to perceive themselves as developing diabetes. Those with high optimistic bias were less likely to perceive themselves as at risk of developing diabetes.

A multiple regression analysis was performed to estimate the proportion of variance in intended lifestyle changes that can be accounted for by actual risk and perceived risk of developing diabetes (see *Table 3*). The predictor variables demonstrated 37.2% of the variability in intended lifestyle changes. Perceived risk was the only significant predictor of intended lifestyle changes. The greater the perceived risk of developing diabetes, the more likely the intention to make lifestyle changes.

Discussion

In this cohort of staff and students at a university campus, the AUSDRISK was able to identify that nearly a quarter of participants were at high-risk of developing diabetes. Interestingly, the largest proportion of participants fell into the intermediate-risk range, which advocates prevention strategies targeting those at intermediate-risk. It would be expected that unless lifestyle changes are implemented, this group of people could potentially move into the high-risk category within 5 years. From this small study, the results are also in-line with evidence that shows that high-risk is greater for men (Tanamas et al, 2012).

As expected with Hypothesis 2, there was a significant difference between Time 1 and Time 2 perceived risk scores. The reduction in perceived risk shown in the low-risk group is not unexpected and this trend reflects existing research (Brewer et al, 2007; Wang et al, 2009; Carpenter, 2010). A large proportion of participants (72.7%) in the high-risk category recorded an increase in perceived risk as a result of the AUSDRISK assessment. This has implications for clinical practice in that the AUSDRISK can be used as an objective tool to help individuals achieve a better understanding of their risk. With a better understanding of risk, individuals are more likely to be open to clinical intervention such as motivational interviewing,

and diabetes and lifestyle education, in order to bring about behaviour change.

There is no clear consensus in the literature as to whether threat of illness influences perceived risk in the absence of symptoms. It is possible that those at high-risk are already exhibiting some of the risk factors, such as inadequate exercise, smoking or family history of diabetes, and the actual risk assessment process has reinforced their existing perceptions of risk. Some support for this may be found in the regression analysis testing Hypothesis 3 that reports that actual risk measured with the AUSDRISK and optimistic bias are the main predictors for perceived risk of developing diabetes in the high-risk group.

Results of the regression analysis lend support to the hypothesised predictive ability of perceived risk and actual risk in explaining the variability in intention to make lifestyle changes (Hypothesis 4), thus supporting a partial test of the HBM as not all variables from the model were considered. If participants' perceived risk was reinforced by actual risk of developing diabetes as measured by the AUSDRISK, they were more likely to intend planning lifestyle changes.

Some limitations of the current research need acknowledging. While risk scores were used to examine intention to plan lifestyle changes, this study was completed in the immediate time frame of risk assessment and does not represent actual behavioural change. A more comprehensive study would ideally include a longitudinal component to investigate any action taken by participants as a result of their risk assessment. In addition, the generalisability of results is limited by sample size and selection.

Conclusion

Given the asymptomatic nature of type 2 diabetes and the serious consequences of the condition, the early detection through risk identification is vital to prevention measures. This study has shown that actual diabetes risk assessment, using AUSDRISK, was found to heighten perceived risk of developing diabetes and likelihood of intention to make lifestyle behaviour changes. Additionally, this research provided evidence supporting the usefulness of the AUSDRISK in detection of individuals at high-risk of developing diabetes. It is hoped that this evidence will contribute to greater promotion and increased uptake of the tool. ■

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The AUSDRISK can be completed on the Department of Health website at http://bit.ly/1pmHY9O

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