Evaluation of the Living with Diabetes Program for People with Type 2 diabetes: East Metropolitan Population Health Unit 2001-2002

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Table of Contents

LIST OF GRAPHS

1.0 Introduction

Type 2 diabetes is a major public health concern in Australia. A recent Australian study identified that the prevalence of diabetes in the Australian population over the age of 25 years and older was 7.5% and rose from 2.5% in the 35-44 age group to 23.6% in those 75years and over (Dunstan, D. *et al.*, 2001). Therefore the estimated total population of people with diabetes in Australia is 940,000 people and is likely to rise to 1.2 million by 2010. Concurrently it is estimated that the direct health costs for diabetes in Australia is likely to exceed $2.3 billion dollars by the year 2010 (McCarty, D. J. *et al.*, 1996).

Compared to people with other chronic diseases, people with diabetes are able to take responsibility for their own health care. A number of lifestyle risk factors have been identified, which can be modified by individuals affected by diabetes. This means that they must learn self-management skills and make lifestyle changes to effectively manage their condition and avoid and delay its associated complications. Consequently, the provision of information about diabetes, lifestyle modification and self-care education and skills training for people with diabetes has long been accepted as the cornerstone of successful diabetes management. Diabetes programs therefore, need to promote knowledge about diabetes and self-management behaviours, skills training in behaviour modification pertaining to lifestyle modification and self-management and support to enable adjustment to having diabetes.

The Living with Diabetes program (LWD) is an evidenced-based program that has been implemented in Eastern Perth. This report describes the evaluation of the program conducted in the Bentley and Inner City Districts in the 2001-2002 period.

2.0 Program Aim

To improve self-management and facilitate lifestyle modification for people with Type 2 diabetes through high quality education and therefore reduce the risk or delay the onset of complications associated with uncontrolled diabetes.

2.1 Program Participants.

The primary target group was people diagnosed with Type 2 diabetes who were being managed with tablets or lifestyle in the East Metropolitan Population Health Unit (EMPHU) area. A secondary target group was the partners of people with diabetes as lifestyle modifications are considered to be more effective with social support.

2.2 Objectives and performance indicators

Increase knowledge and understanding of Type 2 diabetes

To be measured against performance in the following indicators:

- *Increased knowledge of diabetes;*
- *Increased belief that diabetes can be controlled;*
- *Increased knowledge of how insulin works in the body; and*
- *Increased knowledge on blood glucose control.*

Increase knowledge and understanding of relevant lifestyle factors important for diabetes management

To be measured against performance in the following indicator:

- *Increased knowledge about the importance of:*

  -good nutrition for good diabetes control;

  -physical activity for good diabetes control;

  -stress management for good diabetes control;

  -normal blood glucose levels for good diabetes control; and

  -regular tests to monitor diabetes control.

Increase participants' self efficacy in diabetes management

To be measured against performance in the following indicator:

- *Increase participants' confidence to:*

  -do an aerobic activity;

  -follow a healthy eating plan;

  -perform blood glucose monitoring;

  -access information about diabetes from community resources;

  -recognise when the changes in diabetes require seeing a doctor;

  -continue to participate in social and recreational activities;

-discuss personal problems related to diabetes with doctor; and

-get emotional support from family and friends.

Increase participants' perception of health, well being and support

To be measured against performance in the following indicators:

- *Increased number of participants who recognise the seriousness and consequences of :*

  -their diabetes;

  -long term complications of diabetes;

  -whether they will be denied insurance;

  -whether they will miss work; and

  -whether they will be able to take a holiday or trip.
- *Increased number of participants who perceive that diabetes does not affect their feelings of being healthy.*
- *Increased number of participants who feel their diabetes is supported by their doctor or health care team.*
- *Increased number of participants who prepare and plan for their consultation with their doctor.*

Increase adherence to recommended dietary practices

To be measured against performance in the following indicators:

- *Increased number of participants who choose low fat food choices.*
- *Increased number of participants can modify their eating pattern to accommodate recommendations for managing diabetes.*
- *Increased participant satisfaction with flexibility in their diet.*

Increase stress management practices

To be measured against performance in the following indicator:

- *Increased frequency of :*

  -relaxation techniques; and

  -positive affirmation.

Increase adherence to recommended physical activity guidelines

To be measured against performance in the following indicators:

- *Increased frequency of:*

  -days per week that participants are physically active;

  -stretching or strengthening activities; and

  -walking.

- *Increased level of intensity of physical activity undertaken.*

Improve diabetes risk management

To be measured against performance in the following indicators:

- *Increased frequency of checks by health professionals;*
- *Increased frequency of checks for health risk areas; and*
- *Increased number of participants who self test blood glucose levels.*

3.0 Strategies

The LWD program, was developed by Diabetes Australia, Western Australia in the year 2000. This evidenced-based program utilises behaviour change strategies to improve self-management and facilitate positive behaviour change. The focus is to facilitate skills development required to effectively self-manage diabetes. The program has standardised lesson plans, lesson outlines, overheads, educator resources, participant resources, evaluation *pro forma* and extension activities.

The program includes six weekly sessions of 180 minutes' duration. The common theme through the program is the concept of a racetrack. The race track concept was developed to bring together all of the key areas for self-management of diabetes and add a concrete focus to all the factors that are considered essential to optimal diabetes management. By the completion of the program the participants have completed one circuit of the racetrack. The aim is to reorientate the person with diabetes to have locus of control, where they are the "driver" and the health care team are their "pit crew" who are there to help them keep on track with their diabetes self management. Each week the participants complete one section. The six sessions are described as follows:

1. *"Understanding diabetes" provides an overview of the principles of diabetes management and establishes the participants' role in self-managing diabetes. The group rules are established and participants are provided with the first of the resources of their toolkit for self-managing diabetes. The concept of goal setting is explored and participants are provided with templates to develop "personal promises" based on the lessons learnt from the session.*

2. *"Balance in your diet" provides participants with the opportunity to develop skills in dietary management and modify their eating patterns as part of learning to maintain a healthier diet. Prior to the session commencing, the participants have time to discuss and feedback to the group what they found easy to achieve in relation to their "personal promise" from the previous session and what was hard to achieve. The whole group provides strategies to help one another to overcome difficulties and barriers to achieving "personal promises". This process is followed through at the beginning and end of each session and adherence to completing this session by the participants tends to improve, as the participants become more familiar and comfortable with the processes.*

3. *"Supermarket Tour" provides participants with opportunity to identify products that are healthy dietary choices within a supermarket setting. The session is conducted off site at a supermarket in the local area.*

4. *"Balancing Life": stress reduction and physical activity enables participants to identify strategies to manage stress and develop skills to maintain regular physical activity.*

5. *"Risk Management, medication and diabetes" provides participants with the knowledge, skills and confidence to prevent or reduce the severity of short and long term complications associated with diabetes.*

6. *"Making Smart Choices" increases participants' knowledge, confidence and ability to make informed health choices regarding Type 2 diabetes and know where to access ongoing support required for adhering to self managing diabetes.*

On completion of the LWD program the participants have collated their toolkit required to self-manage diabetes. The health care team's identity has changed from one of control to one of support.

The program facilitators are a multidisciplinary health care team that have recognised qualifications in diabetes education and have also attended sessions to familiarise themselves with the LWD program.

The Inner City Health District was a pilot site for the LWD program in 2000. Based on the success and evaluation results of the pilot program, the program was continued in the Inner City District of EMPHU. In the year 2001-2002, Bentley Health District commenced the LWD program. In the year 2001-2002, 26 programs were conducted in Bentley District and 31 were provided in Inner City District. Each program caters for 15 participants and their partners. The programs in Bentley District are implemented at Belmont Community Health Centre and at Bentley Hospital. The programs in Inner City District are implemented at a number of community locations including Diabetes Australia Western Australia, Mercy Hospital, Perth Hills Division of General Practice, Alexander Library, Beatty Park Aquatic Centre and the Loftus Centre.

4.0 Process Evaluation Results

4.1 Sample description

Pre program evaluation questionnaires were completed by 16 people with diabetes from the Bentley program site, 10 people from the Perth Hills Division of General Practice site in Mt Lawley, 12 from the Loftus Centre site in Leederville and 23 from the Diabetes Australia Western Australia site in East Perth.

A total of sixty-one (61/61) returned questionnaires at pre-test with two of these from support persons who do not have diabetes. At post-test, forty-five (45/61) questionnaires were returned, giving a response rate of 73.7%.

Males represented 46% of the sample at pre-test and 46.5% at post-test. The average age of respondents at pre-test was 58 years old and 58.6 years at post-test. 28% of respondents were aged between 70-79 years. The largest age group was 50-59 (42.8%) year olds.

Table 1 Age

	Pre-test		Post-test	
	n	%	N	%
20 – 29	1	1.6		
30 – 39	1	1.6	1	14.3
40 – 49	10	16.3		
50 – 59	23	38	3	42.8
60 – 69	21	34.4	1	14.3
70 – 79	5	8.1	2	28.6
Total	61	100	7	100

Table 2 Gender

	Pre-test		Post-test	
	n	%	N	%
Male	28	45.9	20	46.5
Female	33	54.1	23	53.5
Total	61	100	43	100

The highest level of education completed by the greatest proportion of respondents at pre-test was 'some high school' (32.8%) followed by 'completed high school' (22.9%). There were only eight responses to this question at post-test and the greatest proportion of respondents stated their highest level of education as primary school and university or tertiary institution (37.5% and 37.5%% respectively).

Table 3 Highest level of education completed

	Pre-test		Post-test	
	n	%	N	%
Never attended school	2	3.3		
Primary school	6	9.8	3	37.5
Some high school	20	32.8	1	12.5
Completed high school (year 12)	14	22.9		
Trade certificate/TAFE	9	14.8	1	12.5
University or other tertiary institution	10	16.4	3	37.5
Total	61	100	8	100

The most common length of time of diagnosis of diabetes at pre-test was less than one year (61%) followed by more than five years (15.2%) and one to three years (11.9%). These proportions were similar at post-test (62.8%, 14% and 11.6% respectively).

Table 4 How long since participant was diagnosed with diabetes

	Pre-test		Post-test	
	n	%	n	%
Less than 1 year	36	61	27	62.8
1-3 years	7	11.9	5	11.6
3-5 years	4	6.8	4	9.3
More than 5 years	9	15.2	6	14
Not sure	1	1.7		
I do not have diabetes	2	3.4	1	2.3
Total	59	100	43	100

4.2 Attendance

Just over half of the respondents (55.7%) at pre-test stated that they attended the program alone. There were only nine responses to this question at post-test and 66.7% stated that they attended the program alone. Of those attending with someone else, the most commonly named support person at pre-test was spouse (65.4%). Only four respondents answered this question at post-test and family member was the most commonly named support person (75%).

Table 5 Did participant attend program alone?

	Pre-test		Post-test	
	n	%	n	%
Yes	34	55.7	6	66.7
No	27	44.3	3	33.3
Total	61	100	9	100

Table 6 Who else is attending with participant?

	Pre-test		Post-test	
	n	%	N	%
Spouse	17	65.4	1	25
Friend	3	11.5		
Significant other				
Family member	6	23.1	3	75
Total	26	100	4	100

All respondents attended at least four sessions. All six sessions were attended by 80% of respondents, 17% of respondents attended five sessions and 3% attended four sessions.

Table 7 Number of diabetes group education sessions you attended.

	Pre-test		Post-test	
	n	%	n	%
1				
2				
3				
4			1	3
5			6	17
6			28	80
Total			35	100

4.3 Program satisfaction

Most respondents (97.1%) rated the quality of the LWD program as excellent (85.7%) or good (11.4%). The level of understanding of the information presented was rated by 74.3% as very understandable and mostly understandable by the remainder of the respondents (25.7%).

Table 8 Quality of the program as perceived by participants

	Pre-test		Post-test	
	n	%	n	%
Excellent			30	85.7
Good			4	11.4
Fair			1	2.9
Poor				
Total			35	100

Respondents were asked to rate the usefulness of each session with the following results:

- Week 1 – Understanding diabetes was found to be very useful by 75% of the respondents and mostly useful by the remaining 25%.
- Week 2 – Balance in your diet was found to be very useful by 86.1% of the respondents and mostly useful by the remaining 13.9%.

- Week 3 – Shopping tour was found to be very useful by 75% of respondents with the remainder divided between not at all useful (8.3%), not very useful (5.6%), mostly useful (8.3%) and (2.8%) did not attend.
- Week 4 – Balancing life; stress reduction and physical activity were found to be very useful by 73.6% of respondents with the remainder divided between not at all useful (2.9%), mostly useful (20.6%) and (2.9%) did not attend.
- Week 5 – Risk management, medication and diabetes was found to be very useful by 75% of respondents with the remainder divided between not at all useful (2.8%), mostly useful (19.4%) and (2.8%) did not attend.
- Week 6 – Making smart health choices was found to be very useful by 76.6% of respondents with the remainder divided between not very useful (2.9%), mostly useful (17.6%) and (2.9%) did not attend.

Table 9 Level of understanding of information presented.

	Pre-test		**Post-test**	
	n	%	n	%
Very understandable			26	74.3
Mostly understandable			9	25.7
Not very understandable				
Not at all understandable				
Total			35	100

Table 10 Usefulness of Week 1 – Understanding diabetes

	Pre-test		**Post-test**	
	n	%	n	%
Not at all useful				
Not very useful				
Mostly useful			9	25
Very useful			27	75
Did not attend				
Total			36	100

Table 11 Usefulness of Week 2 – Balance in your diet

	Pre-test		Post-test	
	n	%	n	%
Not at all useful				
Not very useful				
Mostly useful			5	13.9
Very useful			31	86.1
Did not attend				
Total			36	100

Table 12 Usefulness of Week 3 – Shopping tour

	Pre-test		Post-test	
	n	%	n	%
Not at all useful			3	8.3
Not very useful			2	5.6
Mostly useful			3	8.3
Very useful			27	75
Did not attend			1	2.8
Total			36	100

Table 13 Usefulness of Week 4 – Balancing life: stress reduction & physical activity

	Pre-test		Post-test	
	n	%	n	%
Not at all useful			1	2.9
Not very useful				
Mostly useful			7	20.6
Very useful			25	73.6
Did not attend			1	2.9
Total			34	100

Table 14 Usefulness of Week 5 – *Risk management, medication and diabetes*

	Pre-test		Post-test	
	n	%	N	%
Not at all useful			1	2.8
Not very useful				
Mostly useful			7	19.4
Very useful			27	75
Did not attend			1	2.8
Total			36	100

Table 15 Usefulness of Week 6 – *Making smart health choices*

	Pre-test		Post-test	
	n	%	N	%
Not at all useful				
Not very useful			1	2.9
Mostly useful			6	17.6
Very useful			26	76.6
Did not attend			1	2.9
Total			34	100

Respondents were asked to rate the degree to which the LWD program met their needs. All respondents stated either that "almost all my needs have been met" (61.1%) or "most of my needs have been met" (38.9%).

Table 16 Degree to which program met participants needs

	Pre-test		Post-test	
	n	%	n	%
Only a few of my needs have been met				
None of my needs have been met				
Almost all my needs have been met			22	61.1
Most of my needs have been met			14	38.9
Total			36	100

5.0 Impact Evaluation Results

5.1 Knowledge and understanding of Type 2 diabetes

Respondents were asked to rate the extent to which they agree with the statement "I know as much as I need to know about diabetes". At pre-test, 8.2% agreed or strongly agreed with the statement and at post-test 61.3% agreed or strongly agreed.

Table 17 Extent to which participants agree that they know as much as they need to know about diabetes

	Pre-test		Post-test	
	n	%	n	%
Strongly disagree	14	23	2	4.55
Disagree	31	50.8	15	34.1
Agree	4	6.6	24	54.55
Strongly agree	1	1.6	3	6.8
Don't know	11	18		
Total	61	100	44	100

Respondents were asked the extent to which they agree with the statement "there is not much I seem to be able to do to control my diabetes". The number of respondents who disagreed or strongly disagreed with the statement increased over the duration of the program from 62.3% at pre-test to 81.8% at post-test. Respondents' perception of their diabetes control as excellent or very good increased from 9.3% at pre-test to 28.6% at post-test. The overall increases in perception of either good, very good or excellent control increased from 57.4% to 73.8 %.

Table 18 Extent to which participants agree that "there is not much they are able to do to control their diabetes"

	Pre-test		Post-test	
	n	%	n	%
Strongly disagree	16	26.2	24	54.5
Disagree	22	36.1	12	27.3
Agree	9	14.7	7	15.9
Strongly agree	5	8.2	1	2.3
Don't know	9	14.8		
Total	61	100	44	100

Table 19 Participant perception of their diabetes control

	Pre-test		Post-test	
	n	%	n	%
Excellent			2	4.8
Very Good	5	9.3	10	23.8
Good	26	48.1	19	45.2
Fair	20	37.0	9	21.4
Poor	3	5.6	2	4.8
Total	54	100	42	100

Knowledge of how insulin works in the body by helping glucose enter the cells almost tripled from 26.3% at pre-test to 75.6% at post-test. Respondents were asked to identify what levels of blood glucose people with diabetes should generally aim for [1]. Approximately one third (35%) answered below 8 mmol/L at pre-test and this figure increased to two thirds (68.2%) at post-test. Over a quarter of respondents (28.3%) answered below 5 mmol/L at pre-test with a similar response at post-test (27.3%).

Table 20 How insulin works in the body

	Pre-test		Post-test	
	n	%	N	%
Dissolves glucose	4	7	3	7.3
Helps to get rid of glucose in the urine	5	8.8	1	2.4
Slows down the absorption of glucose	8	14	4	9.8
Helps glucose enter the body cells	15	26.3	31	75.6
Not sure	25	43.9	2	4.9
Total	57	100	41	100

Table 21 Blood glucose levels for good control

	Pre-test		Post-test	
	n	%	n	%
5 mmol/L	17	28.3	12	27.3
12 mmol/L	4	6.7	2	4.5
8 mmol/L	21	35	30	68.2
Not sure	18	30		
Total	60	100	44	100

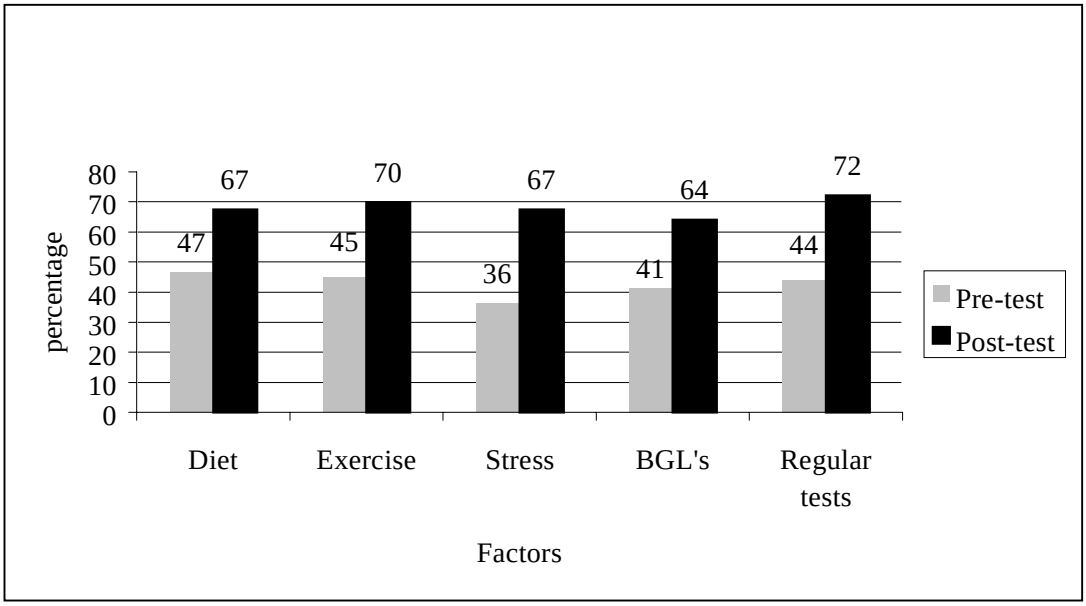
5.2 Knowledge and understanding of relevant lifestyle factors [2]

Respondents identified to what extent they agree diet, exercise, stress management, measuring their blood glucose levels and regular check ups and tests are important for maintaining good diabetes control.

[1] The intended answer for this question was below 8mmol/L, however the answer below 5mmol/L was also correct if testing was prior to eating.
[2] Refer Appendix I Tables 22 – 28.

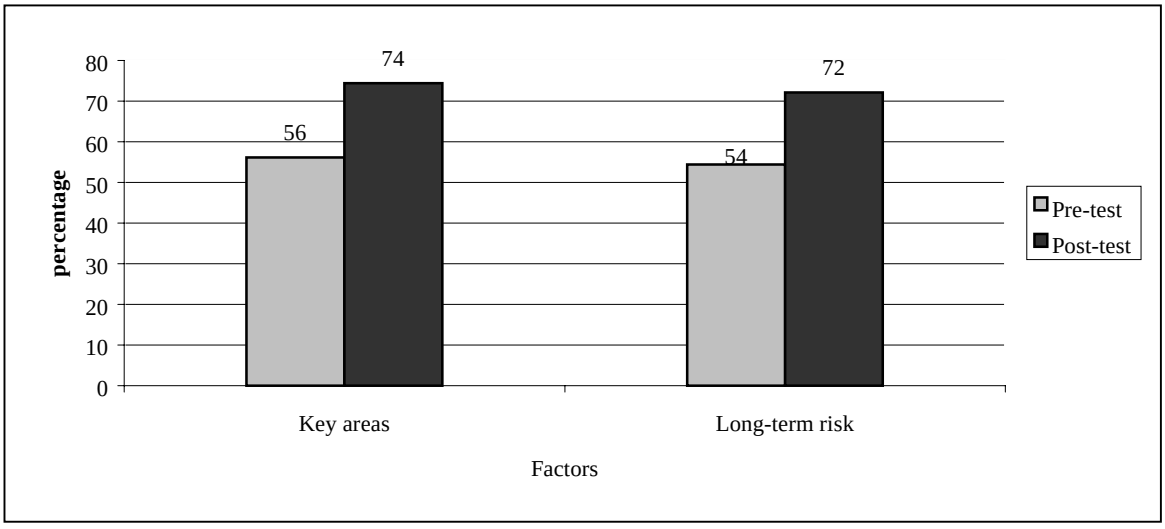
Graph 1a represents those who strongly agree these factors are important at pre-test and at post-test.

Graph 1a Factors important for maintenance of good diabetes control.



There was also an overall increase in those who strongly agree that the key areas of diabetes management are important for maintaining good control of diabetes and for reducing the risk of long-term complications. Graph 1b illustrates those who strongly agree these factors are important.

Graph 1b Factors important for maintenance of good diabetes control

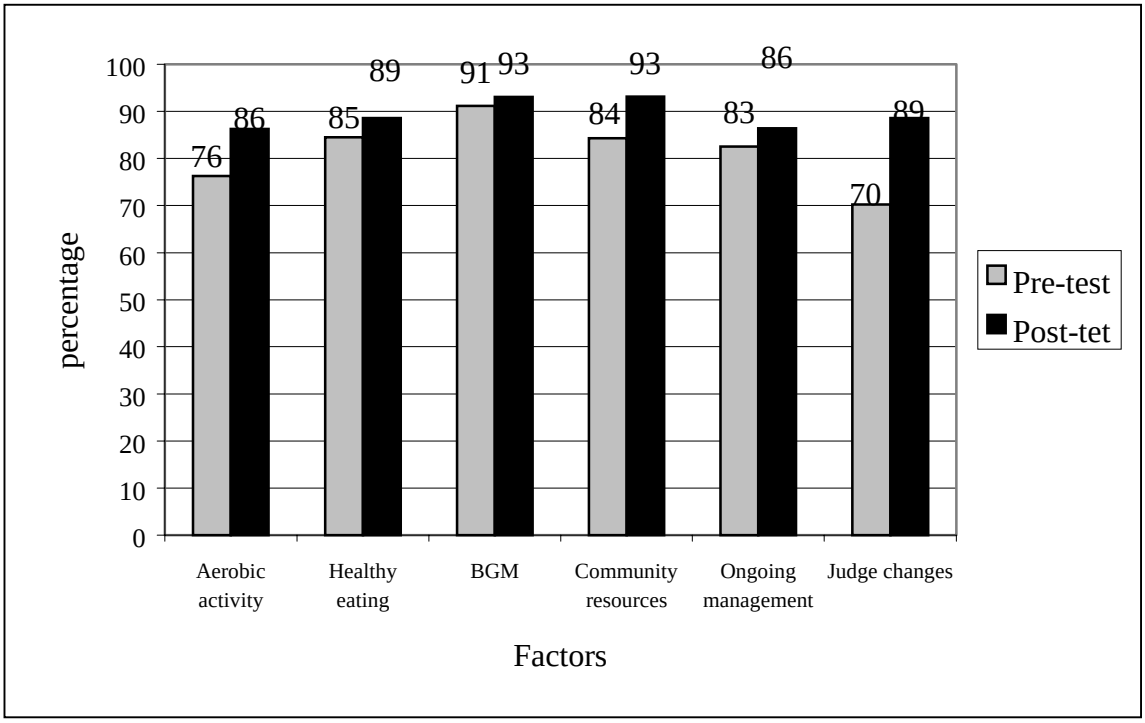


5.3 Self efficacy [3]

Self-efficacy or confidence in one's ability to do a specific task or achieve a certain result was tested across a number of factors. The pre-test results for being confident or very confident in all factors were high (70% and above) with post-test results generally showing further increase (84% and above).

Graph 2a represents the increase in respondents who are very, or quite confident to: do an aerobic activity such as walking, swimming or cycling 3-4 times per week; follow a healthy eating plan; use blood glucose monitoring as part of diabetes management; get information about diabetes from community resources: do all the things necessary to manage their diabetes on an ongoing basis; and judge when changes in their diabetes control mean they should visit a doctor.

Graph 2a Self efficacy

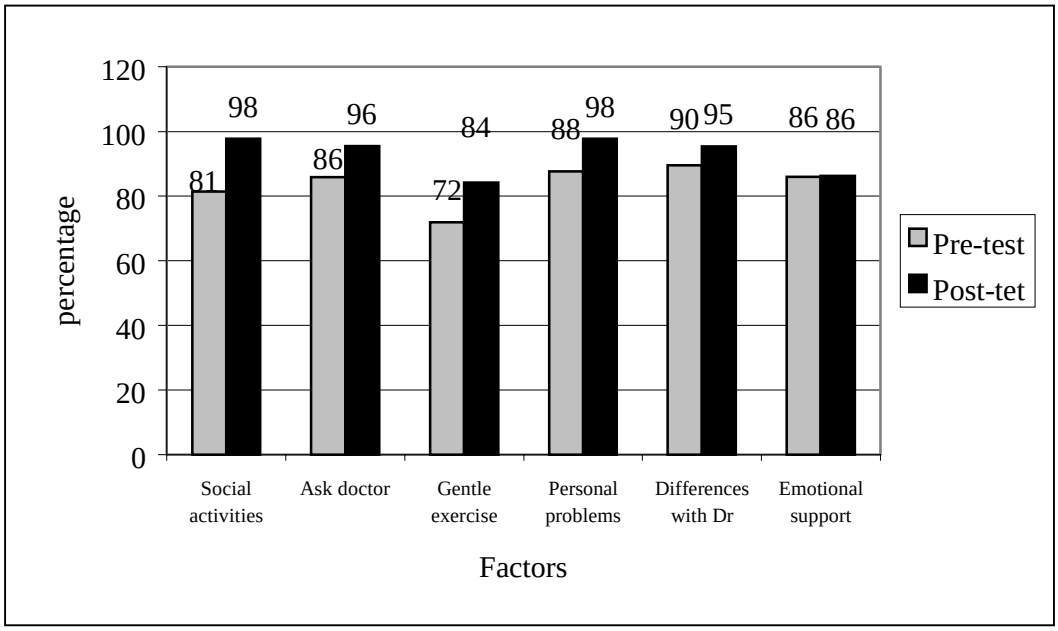


Graph 2b indicates the increase in respondents who are very or quite confident to: continue to participate in social and recreational activities with friends and family; ask

[3] Refer Appendix I Tables 29 – 40.

their doctor about diabetes; do gentle exercise; discuss personal problems related to diabetes openly with their doctor; work out differences with their doctor; and get emotional support from friends and family.

Graph 3b Self efficacy



5.4 Perception of health, well being and support

Approximately one quarter (26.2%) of respondents rated their health as excellent or very good at pre-test and this increased to almost a third of respondents at post-test (34.1%). Those who rated their health as fair decreased from 21.3% at pre-test to 15.9% at post test.

Table 41 Participant perception of their health

	Pre-test		Post-test	
	n	%	N	%
Excellent	5	8.2	1	2.3
Very Good	11	18	14	31.8
Good	32	52.5	22	50
Fair	13	21.3	7	15.9
Total	61	100	44	100

The group that always worried about their diabetes reduced from 34.5% to 19%. There was an increase in those who occasionally worry about their diabetes from 39.6% at pre-test to 42.9% at post-test. Those that always worry about whether they will be denied insurance increased from pre-test (3.8%) to post-test (11.9%) and those that always worry about whether they will miss work increased from pre-test (2%) to post-test (4.9%). There was an increase in those who occasionally worry about whether they will be denied insurance (9.4% at pre-test and 11.9% at post-test), whether they will miss work (11.8% at pre-test and 14.6% at post-test) and whether they will be able to take a holiday or trip (13.2% at pre-test and 14.3% at post-test). There was no change in those who occasionally worry about long term complications of diabetes (42.9% at pre and post-test).

Table 42 How often participants worry about their diabetes

	Pre-test		Post-test	
	n	%	n	%
Never worry	8	13.8	7	16.7
Rarely worry	7	12.1	9	21.4
Occasionally worry	23	39.6	18	42.9
Always worry	20	34.5	8	19.0
Total	58	100	42	100

Table 43 How often participants worry about long-term complications of diabetes

	Pre-test		Post-test	
	N	%	n	%
Never worry	5	8.9	4	9.5
Rarely worry	7	12.5	11	26.2
Occasionally worry	24	42.9	18	42.9
Always worry	18	32.1	8	19.0
Not sure	2	3.6	1	2.4
Total	56	100	42	100

Table 44 How often participants worry about whether they will be denied insurance

	Pre-test		Post-test	
	N	%	n	%
Never worry	29	54.7	15	35.7
Rarely worry	9	17.0	14	33.3
Occasionally worry	5	9.4	5	11.9
Always worry	2	3.8	5	11.9
Not sure	8	15.1	1	2.4
N/A			2	4.8
Total	53	100	42	100

Table 45 How often participants worry about whether they will miss work

	Pre-test		Post-test	
	n	%	n	%
Never worry	32	62.7	21	51.2
Rarely worry	10	19.6	9	22.0
Occasionally worry	6	11.8	6	14.6
Always worry	1	2.0	2	4.9
Not sure	2	3.9		
N/A			3	7.3
Total	51	100	41	100

Table 46 How often participants worry about whether they will be able to take a holiday or trip

	Pre-test		Post-test	
	n	%	n	%
Never worry	32	60.4	24	57.1
Rarely worry	7	13.2	10	23.8
Occasionally worry	7	13.2	6	14.3
Always worry	7	13.2	2	4.8
Total	53	100	42	100

Respondents were asked about the extent to which diabetes affects their feelings of being healthy. Those who said “very much” decreased from 22.4% at pre-test to 7% at post-test. Half the respondents (50%) stated at pre-test that their doctor or health care team support them very much and this figure remained fairly static at post-test (48.8 %). There was an increase in those who always prepare a list of questions to see their doctor from 18.6% at pre-test to 32.6% at post-test.

Table 47 To what extent diabetes affects participant feelings of being healthy

	Pre-test		Post-test	
	n	%	n	%
Not very much	17	29.3	17	39.5
A little	15	25.9	11	25.6
Some	10	17.2	12	27.9
Very much	13	22.4	3	7
Not sure	3	5.2		
Total	58	100	43	100

Table 48 To what extent does your doctor or health care team support you or help you with your diabetes

	Pre-test		Post-test	
	n	%	n	%
Not very much	5	8.9	1	2.3
A little	4	7.2	3	7
Some	19	33.9	18	41.9
Very much	28	50	21	48.8
Total	56	100	43	100

Table 49 How often participants prepare a list of questions to see doctor

	Pre-test		Post-test	
	n	%	N	%
Never	11	18.6	10	23.2
Rarely	15	25.5	6	14
Occasionally	21	35.6	13	30.2
Always	11	18.6	14	32.6
Not sure	1	1.7		
Total	59	100	43	100

5.5 Dietary practices

Those who always trim the visible fat off their meat increased from 49.2% at pre-test to 54.5% at post-test. There was also an increase in respondents who always choose low fat milk from 72.1% at pre-test to 81.4% at post-test.

Table 50 How often participants trim visible fat off their food

	Pre-test		Post-test	
	n	%	N	%
Never	3	4.9		
Rarely	1	1.6	3	6.8
Occasionally	6	9.9	3	6.8
Usually	20	32.8	13	29.5
Always	30	49.2	24	54.5
N/A	1	1.6	1	2.4
Total	61	100	44	100

Table 51 How often participants choose low fat milk

	Pre-test		Post-test	
	n	%	N	%
Never	2	3.3	1	2.3
Rarely	2	3.3	1	2.3
Occasionally	4	6.6	3	7
Usually	6	9.8	3	7
Always	44	72.1	35	81.4
N/A	3	4.9		
Total	61	100	43	100

Respondents were asked how often their diabetes interferes with what they eat and drink. At pre-test 37.3% responded never or not very much and this increased to 68.2% at post-test. Respondents who were quite or very satisfied with the flexibility they have in their diet increased from 56.9% at pre-test to 72.7% at post-test.

Table 52 How often diabetes interferes with what participants eat and drink

	Pre-test		Post-test	
	n	%	N	%
Never	4	6.8	4	9.1
Not very much	18	30.5	26	59.1
Quite a lot	22	37.3	11	25
Very much	8	13.5	3	6.8
Not sure	7	11.9		
Total	59	100	44	100

Table 53 Participant satisfaction with flexibility in their diet

	Pre-test		Post-test	
	n	%	N	%
Very dissatisfied	4	6.9	5	11.4
A bit dissatisfied	11	19	5	11.4
Neither	10	17.2	2	4.5
Quite satisfied	29	50	26	59.1
Very satisfied	4	6.9	6	13.6
Total	58	100	44	100

5.6 Stress management

The number of respondents who practice any form of relaxation never or almost never, halved between pre-test (74%) and post-test (31.7%). There was an increase in the number of respondents who very often talk to themselves in positive ways from pre-test (7.4%) to post-test (15%).

Table 54 How often participants practice any form of relaxation

	Pre-test		Post-test	
	n	%	n	%
Never	25	50	6	14.6
Almost never	12	24	7	17.1
Sometimes	1	2	20	48.8
Fairly often	11	22	8	19.5
Very often	1	2		
Total	50	100	41	100

Table 55 How often participants talk to themselves in positive ways

	Pre-test		Post-test	
	n	%	n	%
Never	11	20.4	5	12.5
Almost never	5	9.2	7	17.5
Sometimes	21	38.9	14	35
Fairly often	13	24.1	8	20
Very often	4	7.4	6	15
Total	54	100	40	100

5.7 Physical activity[4]

There was an increase in the number of respondents who are physically active on 4 or more days from one third (33.3%) at pre-test to one half (50%) of respondents at post-test. Respondents were asked to rate the level they most often perform when physically active. The highest proportion most often performed physical activity at a level between where they are gently puffing but not puffing hard. There was an increase in this level from 57.4% at pre-test to 61.4% at post-test. There was a decrease in respondents who do not exercise from 8.1% at pre-test to 4.5% at post-test.

Table 56 Number of days during the last week participants were physically active

	Pre-test		Post-test	
	N	%	n	%
0	5	8.3	3	6.8
1	12	20	4	9.1
2	6	10	6	13.6
3	17	28.4	9	20.5
4	5	8.3	9	20.5
5	5	8.3	6	13.6
6	4	6.7	4	9.1
7	6	10	3	6.8
Total	60	100	44	100

Table 57 Level of physical activity

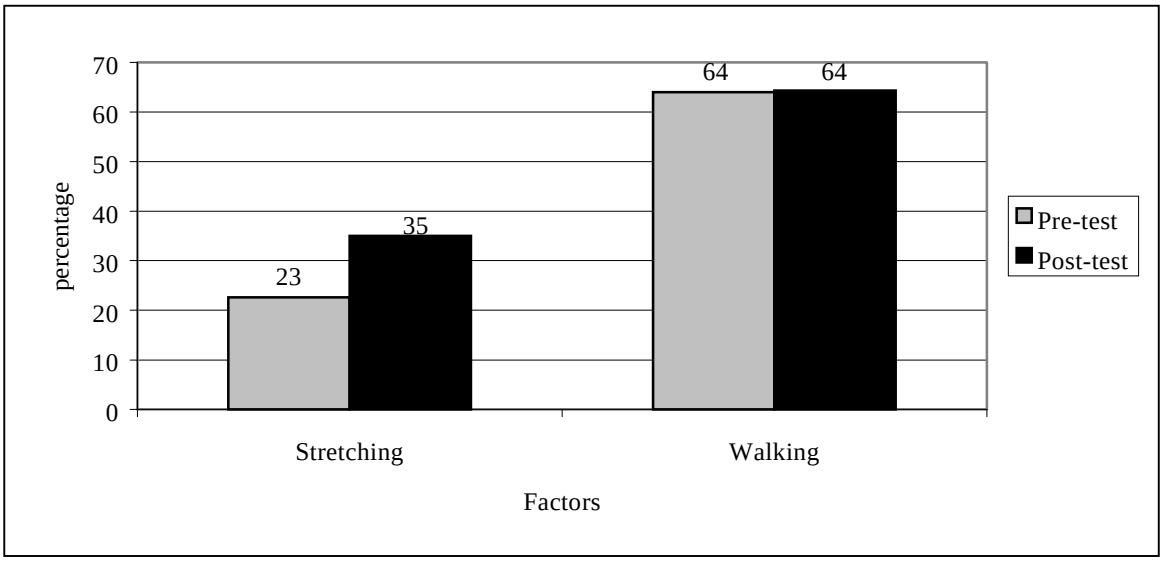
	Pre-test		Post-test	
	N	%	n	%
Not puffing	13	21.3	8	18.2
2	4	6.6	4	9.1
Gently puffing	28	45.9	18	40.9
4	7	11.5	9	20.5
Puffing hard	4	6.6	3	6.8
Do not exercise	5	8.1	2	4.5
Total	61	100	44	100

Graph 3 illustrates respondents who respondents in stretching and walking for greater than 30 minutes per week. Respondents who did stretching exercises for greater than 30 minutes in one week increased from 22.6% at pre-test to 35% at post-test.

4 Refer Appendix I Table 58 – 59.

Respondents who engaged in walking for a total of 30 minutes or more during a week remained static from pre-test to post-test (average 64.1%).

Graph 4 Stretching and walking for greater than 30 minutes

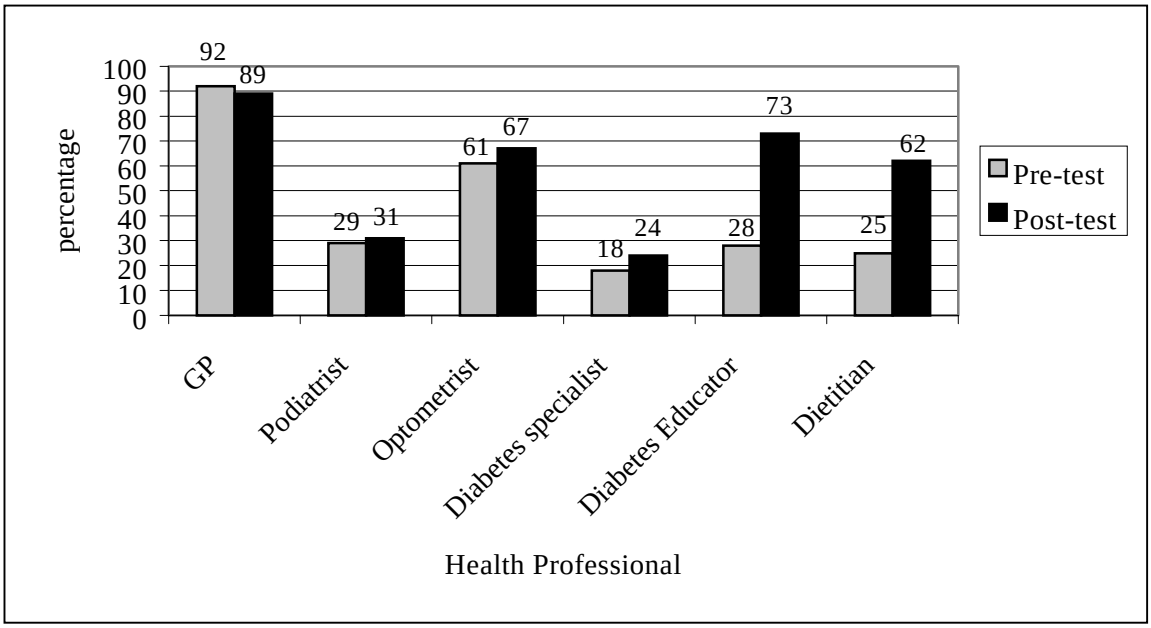


5.8 Risk management [5]

Graph 4 illustrates checks by health professionals undertaken by respondents. At pre-test almost all respondents (92%) identified they had seen their general practitioner since they had been diagnosed with diabetes. In the timeframe between completing the pre-test and the post test questionaries less respondents (89%) had seen their general practitioner at post-test. There were slight increases in respondents who had seen a podiatrist (29% at pre-test to 31% at post-test), an eye specialist (61% at pre-test to 67% at post-test) and diabetes specialist (18% at pre-test and 24% at post-test). There was a large increase in respondents who had seen a diabetes educator (from 28% at pre-test to 73% at post test) and dietitian (from 25% at pre-test to 62% at post test).

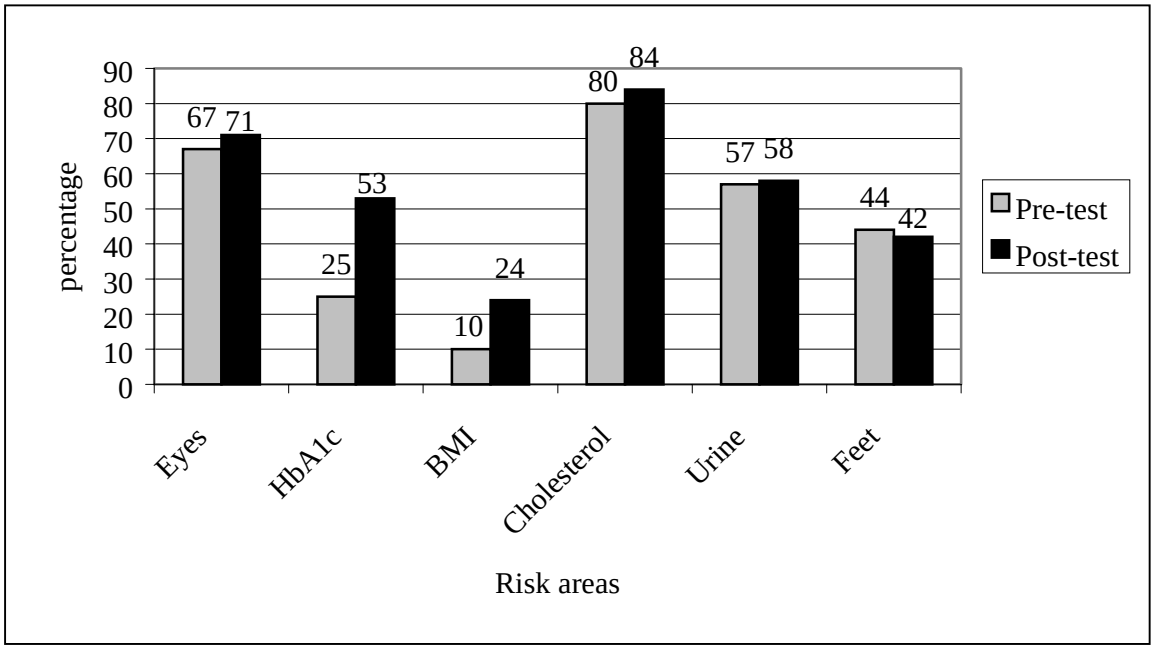
[5] Refer Appendix I Tables 60 – 61& 64-65.

Graph 5 Checks by health professionals



Graph 5 illustrates routine diabetes risk checks undertaken by respondents. There were slight increases in respondents who had checks on their eyes (pre-test 67% and post-test 71%), cholesterol (pre-test 80% and post-test 84%) and urine (pre-test 57% and post-test 58%). Respondents who had their HbA1c checked doubled between pre-test (25%) and post-test (53%). Approximately one tenth (10%) of respondents had their body mass index checked at pre-test and this increased to one quarter (24%) at post-test. There was a slight decrease in respondents who had their feet checked between pre-test (44%) and post-test (42%).

Graph 6 Routine Diabetes Risks Checks



There was a large increase in respondents who test their own blood glucose levels with a blood glucose monitor from 69.5% at pre-test to 83.7% at post-test.

At post-test the proportion of respondents who test their blood glucose levels twice per week was 44.8%, the highest proportion of respondents stated that they test twice per day on the days they do test their blood glucose levels (64.2%) and that they are most likely to test their blood glucose levels in the morning and after meals (58.6%). There are no pre-test comparisons for these factors.

Table 62 Participants who currently test their own blood glucose levels with a blood glucose monitor

	Pre-test		Post-test	
	n	%	n	%
Yes	41	69.5	36	83.7
No	18	30.5	7	16.3
Total	59	100	43	100

Table 63 Number of days per week that participants usually test their blood glucose levels

	Pre-test (N/A)		Post-test	
	n	%	n	%
1			3	10.3
2			13	44.8
3			4	13.8
4			1	3.5
5			2	6.9
6			1	3.5
7			5	17.2
Total			29	100

6.0 Discussion

6.1 Program satisfaction

It is evident that the LWD program meets the needs people of a wide age and education range. The age variation ranged from some in the under 40 age group, the majority in the 50-69 age group and 29% in the 70-79 age group. Approximately one third of the participants had only attended primary school and respectively one third had tertiary qualifications. Satisfaction with the program was rated highly by 97.1 % of participants.

Another variable identified in those attending the LWD program was the duration of diabetes. The largest proportion of participants attending had been diagnosed for less than one year (67%). However, 15.2 % had been diagnosed for greater than five years. This indicates that the LWD program can be offered as suitable for all people with Type 2 diabetes despite age, education and duration of diabetes.

The content of the program is delivered in six sessions. The attendance rate was high in that 97% of participants attended at least five of the sessions. Program coordinators indicated the majority who missed one session booked into other programs to ensure that they did not miss any of the sessions. The participants rated all sessions highly. This indicates that the content of the program is of high quality and was deemed to meet most of the participants needs.

6.2 Knowledge and Understanding of Type 2 diabetes

There were significant changes in efficacy in relation to knowledge and understanding of diabetes and confidence to self-manage diabetes. The perception of knowledge rose from 8.2 % to 61.3%. Furthermore there was only one participant post-test that felt they could not control their diabetes.

The question relating to ideal blood glucose range requires reviewing as it asked participants to indicate what blood glucose level they would aim for. This is in conflict to what is taught, which is a range not a level eg 3.0 mmol/L – 8.0 mmol/L. In the multi choice question, two of the answers were correct. 96.5 % of the participants had chosen one or both of the correct responses.

6.3 Knowledge and understanding of relevant lifestyle factors

The important lifestyle factors for self-management of diabetes were nutrition, physical activity, stress management, controlling blood glucose levels and risk management. All of the participants (100%) rated these factors as important or very important. However, the highest increase in lifestyle factors from the rating of important to very important were stress management, blood glucose control and regular testing for risk factors. Nutrition and physical activity were rated higher in pre-test as it is anticipated that these areas would be more well known by the general population as key factors for diabetes management. In the LWD program each area is given equal weighting in relation to importance in controlling diabetes. This indicates that the increased rating of importance relating to stress management, blood glucose control and risk management were lifestyle factors that the participants new the least about prior to attending the LWD program.

6.4 Self Efficacy and perception of health, wellbeing and support

The key focus in the LWD program is to increase participants' knowledge of diabetes, develop skills to self-manage diabetes, increase participants' confidence to self-manage, all of which lead to behaviour changes needed to self-manage diabetes. The participants' self-efficacy levels were all high pre- test (> 70%). However, confidence

increased in all areas with the exception of emotional support, which remained at 86%. It is acknowledged that results indicate that emotional support is already very high, so further assistance to access emotional support may not be needed immediately after attending LWD programs. However, the EMPHU diabetes programs do not have systems in place to provide ongoing support mechanisms for people who have been diagnosed with diabetes for many years. There is one support group located in Middle Swan area, which has been sustained for many years by group leaders. Formative work has been conducted by Diabetes Australia Western Australia to develop a multi-levelled support system for ongoing support for people with diabetes. This area needs to be developed in order to provide the ongoing emotional support people with a chronic condition like diabetes need in order to self-manage their condition. There are a number of Federal initiatives including "Partners in Health". Key intermediaries in this area, consumer groups and diabetes teams need to integrate to combine resources, prevent duplication and develop a consensus on how to address this area of need effectively and efficiently in light of the limited resources for management of chronic disease in our health system.

The analysis of participants' response to concern and worry about diabetes is difficult to interpret. The increase in the proportion of participants who never worried from 13.8% to 16.7% and rarely worried from 12.1 % to 21.4 % may have been because they were now informed about the consequences of diabetes and felt more in control. The possible reason for increase in the group who occasionally worried from 39.6 % to 42.9% might be that they were now informed of the severe consequences of uncontrolled diabetes and had good reason to occasionally have concern and worry about their diabetes. It is reassuring that despite being informed of the consequences of diabetes the overall trend was to change from always worried to either never, rarely or occasionally worrying. There was considerable reduction in the worry about complications from always worried or not sure, which indicates that a lot of the fear of the unknown about risk reduction for complications was addressed in the LWD program.

6.4 Lifestyle behaviour Change

With respect to making low fat dietary choices, there were 72.1% of participants who were already choosing low milk. This increased to 81.4 % post program. The proportion of participants who adopted additional low fat food choices, like trimming the visible fat off meat increased slightly from 49.2% to 54.5%. This may be interpreted as behaviour that is easier and more convenient to adopt, such as choosing a low fat milk product from the supermarket is more acceptable than a behaviour that requires a little more effort, such as trimming fat off meat. Extra effort may be required to support people to change behaviour that requires a significant personal effort. Incentives such as cooking classes, adding flavour without fat, personal rewards and positive feedback should all be encouraged. Opportunities to attend post LWD program updates may reinforce participants' positive affirmation to adopting healthy eating behaviours. The LWD program did increase participants' confidence in adhering to a healthy eating pattern from 37.3% to 68.2%. Furthermore, their satisfaction with the flexibility in the eating plan changed from 56.9% to 72.7%.

There was a significant reduction in participants who never or almost never practiced any form of relaxation from 74% to 31.7%. Furthermore participants' positive behaviour in self-affirmation increased from 7.4% to 15%. The relationship between the effect of physical and emotional stress on control of blood glucose levels is generally not addressed in traditional medical management practices. There is virtually no reference to the effect of stress on diabetes control in the literature. The general perception is that stress in people's life is a factor that little can be done to manage effectively. However, the LWD program focuses on describing the physiological response in the body to stress and relating that to the respective response in blood glucose levels. The participants of the program relate well to their own personal response to stress and diabetes control. The facilitators are experienced in motivating the participants to take positive steps to stress management and facilitate skill development in this area.

There was an overall increase in the number of participants who were meeting the national physical activity guidelines from 33% to 50%. The notable change in physical activity behaviour was the proportion of participants who included stretching

exercises before and after physical activity from 22.6% to 35%. This is a component of physical activity that needs to be encouraged in diabetes education programs as people with diabetes are more prone to joint and mobility problems due to glycosylation of collagen in tendons and ligaments.

In relation to risk management, the most significant change was participants' access to diabetes educators and dietitians. This is understandable, as they are two of the key facilitators of the LWD program. However, not all participants recognised the facilitators as diabetes nurse educators (72%) or dietitians (62%). This is possibly due to the multidisciplinary philosophy of the diabetes team approach where individual disciplines are not identified.

A well-recognised deficit with diabetes services is the lack of seamless care between members of the diabetes team and access to ophthalmology, podiatry and diabetes specialist services for people with diabetes. Only 31% of participants had seen a podiatrist and 24% had seen a diabetes specialist. EMPHU have a program to improve optometrists' skills in screening for diabetic eye complications and have a system in place to improve people's access to podiatry services. Promotion of these services is required to improve people's access to these essential services.

There was an overall improvement in participants undertaking regular recommended risk checks for eyes, HbA1c, BMI, lipids kidney function tests and feet. The number of participants who monitor their own blood glucose increased from 69.5% to 83.7%. There is a Federal Government program through the Health Insurance Commission to increase capacity of general practitioners to regularly screen for risk factor parameters based on NHMRC guidelines. An adjunct to this program would be to include a client held record that puts the locus of control back to the person with diabetes, as they can ask their medical practitioner to document their results in the record. This would also improve communication between the diabetes health team.

7.0 Conclusion

The evaluation indicates that the LWD program is highly effective in increasing participants' knowledge about diabetes self-management, skills to self-manage diabetes, confidence to self-manage diabetes and motivation and skills to adopt healthy lifestyle behaviours.

Since the pilot program, it has subsequently been implemented into the Swan Health District, and Kalamunda Health District is exploring the feasibility of introducing the program into the area in the near future.

The evaluation tool used to evaluate the LWD program was developed for the pilot program conducted by Diabetes Australia Western Australia in 2000. This evaluation indicates that it is no longer necessary to evaluate the content of the program, which is highly effective. Therefore, an evaluation tool to evaluate and monitor the quality of the program needs to be developed for ongoing quality control and program integrity.

8.0 Recommendations

- Develop an evaluation tool to monitor and evaluate the LWD program in EMPHU area.
- Evaluate 20% of LWD programs conducted in EMPHU each year.
- Develop mechanisms to provide a facility for people with diabetes to access required ongoing psycho-social support for diabetes self-management.
- Implement mechanisms and strategies that will facilitate the capacity of people with Type 2 diabetes to adopt healthy lifestyle behaviours related to nutrition, physical activity, stress management and risk management of diabetes.
- Introduce a client held record for risk management checks.

9 References

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Appendix I

Table 22: What you eat is good for controlling diabetes

	Pre-test		Post-test	
	n	%	N	%
Agree	30	51.7	14	32.6
Strongly agree	27	46.6	29	67.4
Don't know	1	1.7		
Total	58	100	43	100

Table 23: Exercise is important for maintaining good control

	Pre-test		Post-test	
	n	%	n	%
Strongly disagree	1	1.7		
Disagree	1	1.7		
Agree	28	48.3	13	30.2
Strongly agree	26	44.8	30	69.8
Don't know	2	3.4		
Total	58	100	43	100

Table 24: Managing stress is important for maintaining good control of diabetes

	Pre-test		Post-test	
	N	%	n	%
Strongly disagree	1	1.7		
Disagree	1	1.7		
Agree	27	46.6	14	32.6
Strongly agree	21	36.2	29	67.4
Don't know	8	13.8		
Total	58	100	43	100

Table 25: Measuring blood glucose levels are important for managing good control of diabetes

	Pre-test		Post-test	
	N	%	n	%
Strongly disagree	1	1.7		
Disagree	1	1.7		
Agree	28	48.3	15	35.7
Strongly agree	24	41.4	27	64.3
Don't know	4	6.9		
Total	58	100	42	100

Table 26: Regular check up and tests are important for managing good control of diabetes

	Pre-test		Post-test	
	N	%	n	%
Strongly disagree	1	1.7		
Agree	32	54.2	12	27.9
Strongly agree	26	44.1	31	72.1
Total	59	100	43	100

Table 27: Key areas of diabetes management are important for maintaining good control of diabetes

	Pre-test		Post-test	
	n	%	n	%
Strongly disagree	1	1.8		
Agree	24	42.1	11	25.6
Strongly agree	32	56.1	32	74.4
Total	57	100	43	100

Table 28: Key areas of diabetes management are important for reducing your risk of long-tem diabetes complications

	Pre-test		Post-test	
	n	%	n	%
Strongly disagree	1	1.7		
Agree	23	40.4	11	25.6
Strongly agree	31	54.4	31	72.1
Don't know	2	3.5	1	2.3
Total	57	100	43	100

Table 29: Participant confidence to do an aerobic activity

	Pre-test		Post-test	
	n	%	N	%
Not confident	10	16.9	5	11.4
A little confident	4	6.8	1	2.3
Quite confident	18	30.5	17	38.6
Very confident	27	45.8	21	47.7
Total	59	100	44	100

Table 30: Participant confidence to follow a healthy eating plan

	Pre-test		Post-test	
	n	%	n	%
Not confident	1	1.7		
A little confident	8	13.8	5	11.4
Quite confident	25	43.1	10	22.7
Very confident	24	41.4	29	65.9
Total	58	100	44	100

Table 31: Participant confidence to use blood glucose monitoring

	Pre-test		Post-test	
	N	%	n	%
Not confident	2	3.5	1	2.3
A little confident	2	3.5		
Quite confident	18	31.6	12	27.9
Very confident	34	59.6	28	65.2
I'm not sure	1	1.8	1	2.3
N/A			1	2.3
Total	57	100	43	100

Table 32: Participant confidence to get information about diabetes from community resources

	Pre-test		Post-test	
	N	%	n	%
Not confident	1	1.7		
A little confident	5	8.8	3	6.8
Quite confident	23	40.4	17	38.6
Very confident	25	43.8	24	54.6
I'm not sure	3	5.3		
Total	57	100	44	100

Table 33: Participant confidence to do all the things necessary to manage their diabetes on an ongoing basis

	Pre-test		Post-test	
	N	%	n	%
A little confident	9	15.8	4	9.1
Quite confident	18	31.6	16	36.4
Very confident	29	50.9	22	50
I'm not sure	1	1.7	2	4.5
Total	57	100	44	100

Table 34: Participant confidence to judge when the changes in your diabetes control mean you need to visit a doctor

	Pre-test		Post-test	
	N	%	n	%
Not confident	1	1.8	1	2.3
A little confident	12	21	3	6.8
Quite confident	17	29.8	15	34.1
Very confident	23	40.4	24	54.5
I'm not sure	4	7	1	2.3
Total	57	100	44	100

Table 35: Participant confidence to continue to participate in social and recreational activities with friends and family

	Pre-test		Post-test	
	N	%	n	%
Not confident	3	5.1		
A little confident	6	10.2	1	2.3
Quite confident	21	35.6	17	38.6
Very confident	27	45.7	26	59.1
I'm not sure	2	3.4		
Total	59	100	44	100

Table 36: Participant confidence to ask their doctor about diabetes

	Pre-test		Post-test	
	N	%	n	%
Not confident	2	3.5		
A little confident	6	10.5	1	2.3
Quite confident	10	17.6	12	27.3
Very confident	39	68.4	30	68.1
I'm not sure			1	2.3
Total	57	100	44	100

Table 37: Participant confidence to do gentle exercise

	Pre-test		Post-test	
	N	%	n	%
Not confident	6	10.5	1	2.3
A little confident	7	12.3	6	13.6
Quite confident	21	36.8	18	40.9
Very confident	20	35.1	19	43.2
I'm not sure	3	5.3		
Total	57	100	44	100

Table 38: Participant confidence to discuss personal problems related to diabetes openly with their doctor

	Pre-test		Post-test	
	N	%	n	%
Not confident	1	1.8		
A little confident	6	10.5		
Quite confident	11	19.3	15	34.1
Very confident	39	68.4	28	63.6
I'm not sure			1	2.3
Total	57	100	44	100

Table 39: Participant confidence to work out differences with their doctor

	Pre-test		Post-test	
	n	%	n	%
Not confident	3	5.3		
A little confident	2	3.5	1	2.3
Quite confident	7	12.3	13	29.5
Very confident	44	77.2	29	65.9
I'm not sure	1	1.7	1	2.3
Total	57	100	44	100

Table 40: Participant confidence to get emotional support from friends and family

	Pre-test		Post-test	
	n	%	N	%
Not confident	1	1.7	3	6.8
A little confident	5	8.8	2	4.6
Quite confident	18	31.6	14	31.8
Very confident	31	54.4	24	54.5
I'm not sure	2	3.5		
N/A			1	2.3
Total	57	100	44	100

Table 58: Stretching or strengthening

	Pre-test		Post-test	
	N	%	n	%
None	34	64.2	16	40
<30 min per week	7	13.2	10	25
30-60 min per week	6	11.3	6	15
1.25 hrs per week	5	9.4	4	10
>2.5 hrs per week	1	1.9	4	10
Total	53	100	40	100

Table 59: Walking

	Pre-test		Post-test	
	N	%	n	%
None	8	13.1	5	11.9
<30 min per week	14	23	10	23.8
30-60 min per week	16	26.2	7	16.7
1.25 hrs per week	9	14.7	6	14.3
>2.5 hrs per week	14	23	14	33.3
Total	61	100	42	100

Table 60: Checks by health professionals

	Pre-test		Post-test	
	N	%	n	%
GP	56	92	40	89
Podiatrist	18	29	14	31
Optometrist	37	61	30	67
Diabetes specialist	11	18	11	24
Diabetes Educator	17	28	33	73
Dietitian	15	25	28	62

Table 61: Risk areas

	Pre-test		Post-test	
	n	%	n	%
Eyes	41	67	32	71
HbA1c	15	25	24	53
BMI	6	10	11	24
Cholesterol	49	80	38	84
Urine	35	57	26	58
Feet	27	44	19	42

Table 64: Number of times per day, on the day that they do test, do participants usually test their blood glucose levels

	Pre-test (N/A)		Post-test	
	n	%	n	%
1			5	17.9
2			18	64.2
3			1	3.5
4			1	3.6
5			1	3.6
6			1	3.6
7			1	3.6
8			1	3.6
9			1	3.6
Total			28	100

Table 65: Time of the day participant's test their blood glucose level

	Pre-test (N/A)		Post-test	
	n	%	N	%
Morning and after meals			17	58.6
Morning			5	17.3
Other			7	24.1
Total			29	100