Learned Helplessness and Metabolic Control in Type 1 Diabetes

Type 1 Diabetes Mellitus (T1DM) is a chronic condition characterized by an inability to produce insulin, the hormone required for glucose metabolism. Relationships between psychosocial variables and metabolic control, or how well the condition is managed, have been shown. Learned helplessness (LH) is a psychosocial variable characterized by feelings that efforts don’t affect outcomes and is often associated with giving up. The enormous demands of managing T1DM present a scenario where LH is common. LH will be measured using a validated scale, LHS. Self-report of routine blood test result will assess metabolic control. Correlational and regressional analyses will test hypotheses that a relationship between LH and metabolic control exists, and that a higher level of LH predicts worse metabolic control. Implications could lead to alternative interventions, increase awareness about relevant psychosocial variables, and help doctors better understand the context of their treatment protocol which may lead to better clinical care.

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Type 1 insulin-dependent diabetes mellitus is a chronic condition characterized by an inability to produce insulin, the hormone required for glucose metabolism. Treatment of the condition is a balancing act involving multiple daily insulin injections, food intake, exercise, stress, illness, and countless other variables that affect blood glucose concentration and present patients with enormous demands (Watts, O’Hara, & Trigg, 2010). For instance, it is well known that food intake will raise blood glucose, but stress and illness can as well and do so even less predictably and consistently across patients. Insulin brings blood glucose down, and doses must be carefully administered because there is virtually no room for error. As little as 1 unit over what a patient needs can cause dangerous hypoglycemia (low blood glucose), and any amount under what the patient needs will not sufficiently bring blood glucose down to a healthy range. Exercise affects blood glucose in both directions depending on the type of exercise, and these effects also vary widely across patients. It is more often than not a guessing game for these patients, and because treatment and management of the disease are so complex and difficult, many psychosocial variables impact these patients’ lives and disease management (Delamater, 1986; Peyrot et al., 2005).

Research on these psychosocial variables in patients with Type 1 diabetes is quite active. In these studies, disease management is defined by level of metabolic control, which is measured by a blood test called Hemoglobin A1c, abbreviated HbA1c (Gonen, Rachman, Rubenstein, Tanega, & Horowitz, 1977). The range of 4.2 to 7.6 is considered optimal, with ascending values reflecting worse control (Koenig et al., 1976). Regimen adherence is another way patients’ disease management has been measured. This approach focuses more on the patient’s attempt at achieving metabolic control instead of control itself, because it measures how closely the patient
follows the physician’s suggested treatment regimen whether or not that regimen is successful. Nevertheless, it has been shown that regimen adherence is positively correlated with metabolic control (Schafer, Glasgow, McCaul, & Dreher, 1983).

One psychosocial variable that has been studied is how patients with Type 1 Diabetes cope with the demands of managing the disease. Particular coping styles are defined by the typical, habitual ways one approaches a problem or stressor with which they are faced (Carver, Scheier, & Weintraub, 1989). In a study assessing the relationships of various coping styles with disease management, several styles were significantly related (Graue, Wentzel-Larsen, Bru, Hanestad, Sovik, 2004). The study used a variety of established subscales to determine the coping styles of a sample of Type 1 diabetic adolescents. Using HbA1c and these self-report subscales, they found that more emotion-focused coping styles (ex. avoidance) were significantly related to higher HbA1c results, or poorer disease management.

In another study looking at coping in adolescents with diabetes, it was shown that introducing coping skills training into patients’ treatment regimen improved metabolic control (Grey, Boland, Davidson, 1998). Participants were randomly assigned to either the experimental group that received coping skills training or the control group that did not. Coping skills training involved a series of small-group sessions that involved participants role-playing social situations that were shown to be the most troublesome for adolescents with Type 1 Diabetes. The facilitator provided feedback to participants emphasizing positive coping skills such as social problem-solving, cognitive behavior modification, and conflict resolution. These sessions proved to be effective in reducing the negative impact of diabetes on patients’ quality of life, as well as improving their metabolic control. The experimental methodology of this study reveals a causal relationship between a psychosocial variable and its impact on metabolic control.
Coping can also include variables such as defensiveness, adaptability, and locus of control. Defining ‘patient coping’ with these three variables, a study found that greater defensiveness, a lower level of adaptability, and a more external locus of control predicted poorer adherence to treatment regimens in children and adolescents with Type 1 Diabetes (Jacobson et al., 1990). These results suggest variables like locus of control could be related to metabolic control.

Locus of control is a construct describing how much control an individual perceives they have on the outcomes of events. For example, someone with an internal locus of control perceives they have control over outcomes, whereas one with an external locus of control perceives that outside forces (luck, fate, etc.) control outcomes and that his or her efforts have little impact. This construct gave rise to the internality vs. externality dimension of another construct called learned helplessness. The other two dimensions of learned helplessness are global vs. specific, which describes whether feelings of helplessness are universal (global) or only apply to certain situations (specific), and stable vs. unstable, which describes whether or not failure occurs consistently over time (Quinless & Nelson, 1988). Learned helplessness is characterized by attributions that are more external, global, and stable.

The constant and countless demands of managing diabetes require so much effort, yet the goal of metabolic control more often than not remains out of reach, because even the most compliant and diligent patients are still faced with greater risk of health complications as these are part of the normal progression of the disease (Watts et al., 2010). Type 1 Diabetes undoubtedly presents a scenario where patients eventually perceive a lack of association between their efforts and metabolic control, the anticipated outcome. This is a clear example of learned helplessness. With this in mind, research was conducted on the relationship between learned helplessness.
helplessness and metabolic control in children and adolescents with Type 1 Diabetes (Kuttner, Delamater, & Santiago, 1990). To measure learned helplessness they used the 48-item Children’s Attributional Style Questionnaire and scored only the responses to the negative events. Higher summed score indicated greater learned helplessness. Metabolic control was measured by taking the average of 3 HbA1c tests taken during the 4-8 month period prior to the start of the study. Learned helplessness did in fact correlate with poorer long-term metabolic control. Of course, this design cannot say whether poor control leads to learned helplessness or vice versa, but it does suggest a relationship worth investigating further.

One limitation of this study was the measure of learned helplessness. The scales used were from a questionnaire validated to measure attributional style, not learned helplessness specifically. Their measure was a conceptual adaptation of these scales to address the externality vs. internality, global vs. specific, and stable vs. unstable dimensions of learned helplessness but was never validated for that purpose. However, the results suggest that further investigation of this relationship using a validated measure of learned helplessness is needed.

Quinless and Nelson (1988) developed and validated the Learned Helplessness Scale (LHS) as a tool to be used in hypothesis testing and for screening and diagnostic purposes. The LHS is a short, 20-item questionnaire using a 4-choice Likert scale, ranging from Strongly Agree to Strongly Disagree. The items are statements representing all three dimensions of learned helplessness. Higher scores reflect greater agreement with the statements and therefore, greater learned helplessness. The scale is short, easy to complete, and validated to measure learned helplessness specifically, making it a better measure to use in the current investigation of learned helplessness in Type 1 Diabetes.
The current study aims to identify a relationship between learned helplessness and metabolic control in Type 1 Diabetes. Regressional analyses will be used to test for predictive ability. The hypothesis is that learned helplessness and HbAlc will be positively correlated, identifying a relationship between higher levels of learned helplessness and worse metabolic control. The LHS items will be prefaced asking participants to respond in regard to their diabetes so that results could suggest either that poor control predicts learned helplessness or that learned helplessness predicts poor control.

Learned helplessness is not a permanent condition (Seligman & Maier, 1967). Helplessness can be unlearned with attribution retraining, a strategy that involves verbal feedback emphasizing taking responsibility for failure and increasing effort and persistence (Dweck, 1975). Since coping skills training has been shown to improve metabolic control in patients with Type 1 Diabetes (Grey, Boland, Davidson, 1998), similar interventions for reducing learned helplessness, such as attribution retraining, could also be an effective tool in the treatment of patients with Type 1 Diabetes.

**Methods**

**Participants**

Because the LHS is only validated for adults, participants will be limited by a minimum age of 18. Participants will be recruited at the Internal Medicine Subspecialties Clinic at UT Southwestern, an outpatient clinic that specializes in treating disorders of the endocrine system such as Type 1 Diabetes. Recruitment protocol matches that of Kuttner et al. (1990).

**Procedure**

The doctor will ask them if they would like to complete a short survey concerning patients with Type 1 Diabetes. If they agree, the questionnaire will be given as the doctor leaves
the room prior to check out. First, they will need to sign the informed consent document. When finished, questionnaire will be returned to the doctor and placed in a file for pickup by investigator. Participants will not be excluded based on gender, duration of diagnosis, or an upper limit for age. Participants’ responses will only be associated with a participant number, not a name.

Measures

A short questionnaire will be presented to the participant including the LHS, and a self-report of last 3 HbA1c results, as they can recall. Because participants will have just had an appointment with their doctor, it is likely their recall will be accurate because recent test results are often compared to past results to establish context and assess progress. Though self-report of HbA1c may introduce measurement error, it is projected that the convenience of self-report compared to a blood test will be favorable to the participant and increase participation overall. Three HbA1c results will be requested to mimick SP the procedures of Kuttner et al. (1990) for measuring long-term metabolic control. Demographics questions will be limited to age and duration of diagnosis to preserve anonymity. Age and duration of diagnosis will be used in regression analyses to control for these peripheral variables, if necessary.

Data-Analyses

Correlational and regressional analyses in SPSS will be run with scores on the LHS as the predictor variable and calculated mean HbA1c from the 3 self-reported values as the criterion variable. Positive correlation will support the hypothesized relationship between learned helplessness and metabolic control, that ascending learned helplessness is related to descending metabolic control. Multiple regression will be used to determine the contribution of learned
helplessness to mean HbA1c after controlling for age and duration of diagnosis. Significance will be p<0.05.

**Expected Results and Discussion**

A statistically significant positive correlation is expected between learned helplessness and mean HbA1c. This would suggest there is a significant negative relationship between learned helpless and metabolic control. Furthermore, the expected significant regression analysis will imply that a higher level of learned helplessness predicts worse metabolic control. The implications of these findings could lead to the development of alternative interventions in the treatment of Type 1 Diabetes that could improve metabolic control in these patients. The importance of psychosocial variables in chronic diseases will be further supported, increasing awareness about these widely ignored variables and helping doctors better understand the context of their treatment protocol which may lead to better clinical care (Peyrot et al., 2005).
References


