



# **Impact of Parental Knowledge and Coping Strategies on Glycemic Control of Diabetic Children in Ain Shams University Hospital, 2018**

Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سببنا أنك لا تعلم لنا  
إلا ما علمتنا إنك أنت  
العليم العظيم

صدق الله العظيم

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# List of Abbreviations

| Abb.               | Full term                                          |
|--------------------|----------------------------------------------------|
| <i>ABIS</i> .....  | <i>All Babies In Swede</i>                         |
| <i>ADA</i> .....   | <i>American Diabetes Association</i>               |
| <i>DAISY</i> ..... | <i>Diabetes Auto-immune Study in Young</i>         |
| <i>DKT</i> .....   | <i>Diabetes Knowledge Test</i>                     |
| <i>DN</i> .....    | <i>Diabetic Nephropathy</i>                        |
| <i>DR</i> .....    | <i>Diabetic Retinopathy</i>                        |
| <i>ESRD</i> .....  | <i>End Stage Renal Disease</i>                     |
| <i>GFR</i> .....   | <i>Glomerular Filtration Rate</i>                  |
| <i>HbA1c</i> ..... | <i>Glycosylated Hemoglobin</i>                     |
| <i>IDDM</i> .....  | <i>Insulin Dependent Diabetes Mellitus</i>         |
| <i>NDDG</i> .....  | <i>National Diabetes Data Group</i>                |
| <i>OGTT</i> .....  | <i>Oral Glucose Tolerance Test</i>                 |
| <i>RSQ</i> .....   | <i>Responses to Stress Questionnaire</i>           |
| <i>SMBG</i> .....  | <i>Self-Monitoring Blood Glucose</i>               |
| <i>TRIGR</i> ..... | <i>Trial to reduce IDDM in Genetically At Risk</i> |
| <i>UAE</i> .....   | <i>Urinary Albumin Excretion</i>                   |
| <i>VP</i> .....    | <i>Viral Protein</i>                               |
| <i>WHO</i> .....   | <i>World Health Organization</i>                   |

# *Abstract*

The most common adopted coping strategies by the mothers were acceptance of disease, emotional arousal and avoidance with relative scores (71.6%, 69.3% and 68.8%) respectively. While, the least adopted coping strategies were involuntary disengagement (Inaction, cognitive inference and emotional numbing) with relative scores (29.4%, 29% and 27.3%) respectively.

HbA1c in the studied children is it is negatively correlated with cognitive restructure, positive thinking, acceptance and wishful thinking.

Recommendations include implementation of regular health education sessions for parents to raise awareness and to instruct them about the proper way to manage diabetes, increase their knowledge about its possible complications, and to help them to find a way to lower their stress.

**Keywords:** Insulin Dependent Diabetes Mellitus - Glomerular Filtration Rate - Diabetic Retinopathy

## INTRODUCTION

Type 1 diabetes trends in Egyptian children have been increased in the past two decades (*El-Ziny et al., 2014*). The calculated age-adjusted type 1 diabetes incidence among children younger than 15 years old was 0.7, 2.0 and 3.1 per 100,000 in 1996, 2006 and 2011, respectively, while age-adjusted type 1 diabetes prevalence among children younger than 15 years old in the same years was 1.9, 15.5 and 26.8 per 100,000 respectively (*El-Ziny et al., 2014*).

The diagnosis of a child with type 1 diabetes is a great challenge for parents especially when the child isn't developmentally able to manage the disease independently (*Gray et al., 2013*). The special requirements related to glycemic control (frequently reminding the child about taking care of him/herself, frequent clinic/hospitals visits), feeling guilty about the child's disease, feeling embarrassed when telling others about the child's disease, and worrying about the future of the child may lead to psychological stress among the parents (*Compas et al., 2012*). This parental stress may lead to "diabetes burnout" which is a state of getting tired from the responsibilities of diabetes care and may leads to a neglecting behavior towards their children's disease (*Compas et al., 2012*).

Diabetes-specific knowledge of the parents is an important factor in proper management of diabetes in their children (*Erika, 2013*). Parents need to learn how to accurately

calculate insulin dose and different sites of insulin injection, manage the daily diet of the child, recognize the symptoms of hypoglycemia/hyperglycemia and other complications, measure the concentrations of glucose and ketone bodies in the blood and urine, monitor foot health of the child and learn more about the role of exercise on blood glucose levels (**Cruz et al., 2017**).

The ways of parental coping have a great implication on the glycemic control of the child (**Jaser et al. 2014**). According to Folkman and Lazarus 1988 coping is “a multidimensional process referring to how individuals deal with stress, involves conscious cognitive and/or behavioral efforts to deal with events appraised as stressful, or exceeding the resources of the individual”. Coping responses may be engagement coping or disengagement coping; each of them may be primary or secondary (**Grey et al., 2009**).

Primary control engagement coping is directed towards rational management of the disease itself; and includes problem solving, emotional expression, and emotional regulation. Secondary control engagement coping focuses on adapting to the difficulties associated with the disease and includes cognitive restructure, positive thinking, acceptance, asking for help from others and turning to religion. However, disengagement ways of coping include avoidance, denial, social isolation and behavioral or mental disengagement which directed away from the problem (**Grey et al., 2009**).

## AIM OF THE WORK

### Goal

To improve quality of life of diabetic children and coping with the disease.

### Objectives

1. To determine parental diabetes-specific knowledge level regarding medications, diet, physical activity, blood glucose monitoring at home, care for hypoglycemia in their diabetic children aged from 2 to 14 years.
2. To measure parental diabetes-related stress and identify different parental coping strategies in response to their children's illness.
3. To determine the effect of parental diabetes-specific knowledge, parental diabetes-related stress, and adopted parental coping strategies on glycemic control of their diabetic children.

## Chapter 1

# GLUCOSE HOMEOSTASIS AND PATHOPHYSIOLOGY OF TYPE 1 DIABETES

Glucose metabolism is a critical process for normal physiological functions of the body. Glucose has two main functions as a source of energy and as a source of essential material for almost all types of physiological reactions. The brain uses about 120 grams of glucose daily, 60-70% of the total body glucose. Brain function begins to be seriously affected when glucose levels fall below ~40 mg/dl. Ketone bodies can enter the brain and can be used for energy in emergencies as in severe hypoglycemia (*Mergenthaler et al., 2013*).

### 1.1. Synthesis and release of insulin

Insulin is a peptide hormone. It is synthesized in the rough endoplasmic reticulum as a precursor protein called pre-pro insulin; it is then converted to pro-insulin. Pro-insulin is kept into secretory vesicles, where it is processed into the mature peptide hormone (*Sun et al., 2015*).

Under normal conditions, 3-5% of the insulin secretion is in the form of pro-insulin. During periods of high rates of insulin release, the maturation process is not totally completed, and therefore larger amount of pro-insulin up to 10-20% can be found in the circulation (*Sun et al., 2015*).