

An overview of psycho-educational intervention for adolescents with Type 1 diabetes

Subramani, G.,¹ Sangeetha, S.,² & Shankar Shanmugam, R³

Abstract

Background: Successful interventions are needed to enhance the predominant, purposeful and enduring outcome for children and adolescents with Type 1 diabetes. The role of psycho-educational interventions is encouraging adaptation to chronic disease like Type 1 diabetes has received acknowledgement and advocating greater involvement of patients in their own care.

Objective: The purpose of this study aimed to provide an overview of the current literature regarding the psycho-educational interventions for adolescents with type 1 diabetes.

Methods: The researcher searched major databases such as PubMed, PsycINFO, MEDLINE, Scopus, Google Scholar and ISI Proceedings article. Inclusion criteria as systematic reviews, Meta-analysis, descriptive study, and overview based on traditional reviews published in existing literature. Also included cross sectional, experimental and randomized controlled study. The titles of papers are reviewed, abstracts have gotten and looked into, and full copies of chosen papers have been acquired.

Result: No study has focused on a particular psychological disorder such as conduct disorder or depression, or any other behavioral issues, which are known to be increased in adolescents with Type 1 diabetes. Very few studies have been focused on systematic theoretical contribution to construct psycho-educational intervention, particularly, as based on behavioral and cognitive-behavioral approaches. Integrative or hybrid model intervention would be more viable to type 1 diabetes specifically for adolescents and children.

Conclusion: This overview has featured the need to extend the base for psycho-educational interventions, especially in the Indian context.

Key words: *Psycho-educational intervention, Adolescents, Type 1 diabetes.*

¹Research Scholar, Department of Community Medicine, Vinayaka Mission's Kirubanandha Varriyar Medical College, Vinayaka Mission's Research Foundation, Salem – 636308, subbu1573@gmail.com

²Professor, Department of Community Medicine, Vinayaka Mission's Kirubanandha Varriyar Medical College, Vinayaka Mission's Research Foundation, Salem – 636308, balamurugam.sangeetha@rediffmail.com

³ Professor, College of Nursing, Madras Medical College, Chennai – 600003, shankarshaki@yahoo.com

Introduction

Type 1 diabetes mellitus is one of the most common endocrine illnesses in developing countries. In India, over 97,700 children suffered with Type 1 diabetes mellitus (Kumar, Azad, Zabeen, & Kalra, 2012). Also, estimated by Diabetes Atlas 2017 that there are 1,25,000 children and adolescents are affected with diabetes (International Diabetes Federation, 2017). These children and adolescents need a long-term intensive diabetes education or psychoeducational intervention, daily insulin injections, prevention and handling of acute complications, psychological support, and societal support rather than simply omitting or underestimating the illness.

Even though type 1 diabetes are accounted for only 5-10% of all with diabetes, it residue a serious chronic illness. It usually begins in early life than type 2 diabetes. However, it creates more short-term and long-term consequences including physical and psychological aspects. At very recently, studies revealed that psycho-social aspects of interventional therapies and Pharmaco-technological paradigm are equally important to control type 1 diabetes (Patterson et al., 2019).

Management of type 1 diabetes is complex and challenging for adolescents due to the essential integration of every day medical task and lifestyle adjustments into existence. The role of psychoeducation in the management of type 1 diabetes is inevitable to the adolescents and others. Psycho-educational Intervention is referring to the arrangement of information about an illness or issue and techniques for changing or adapting with it. Further, it has been appeared to be of esteem in decreasing mental morbidity and progressing self-care in other therapeutic population (Devins & Binik, 1996). Also, psycho-educational intervention may apply its impact on promoting behavioural changes by expanding the patient's understanding

of the risks and benefits of various behaviours as well as adjusting misinformation and by giving viable techniques or strategies that the person can apply to form changes in their symptomatic behaviour (Olmsted, Daneman, Rydall, Lawson & Rodin, 2002).

In the diabetes mellitus care, psycho-educational intervention not only plays a critical role to incorporate educating the patient about patho-physiology, insulin injections and blood monitoring, but also providing problem-solving strategies to increase success ratio in diabetes care as well as cultivating a sense of competence with respect to self-management (Brown, 1988).

There are various intervention modules in psycho-educational intervention to assist patients with type 1 diabetes mellitus. Due to the technological advancement, implementing intervention to wide range of diabetes population, and reduction of costs, online based psycho-educational intervention has been emerged recently. This internet based model specifically helps to focus on efficacy in progressing symptoms and health behaviours in children and adolescents at different ages (Stinson, Wilson, Gill, Yamada, & Holt, 2008; Ritterband, & Tate, 2009; Siemer, Fogel, & Van Voorhees, 2011). Furthermore, family-based intervention model (FBIM) also implemented widely for diabetes care. By using FBIM, parent involvement in diabetes management which highly helpful and associated with glycemic control in adolescents (Wysocki, Nansel, Holmbeck, Chen, Laffel, Anderson, & Steering Committee of the Family Management of Childhood Diabetes Study, 2009). In addition, family-based behavioural interventions focused on family teamwork around diabetes management have demonstrated positive impacts on glycemic outcomes (Anderson, Brackett, Ho, & Laffel, 1999; Laffel, Vangsness, Connell, Goebel-Fabbri, Butler, & Anderson, 2003).

Further, the use and availability of mobile phones have rapidly increased over the past decade. Global distribution of smart phone usage at the age of 11 to 24 as reported 72% (Davey, & Davey, 2014). Hence, mobile health strategies also emerged. Mobile health (mHealth) strategies as one of the method to improve adolescents' glycemic control and psychosocial wellbeing maintaining caregiver involvement in type 1 diabetes care (Herbert, Owen, Pascarella, & Streisand, 2013).

The purpose of this review paper is to provide an overview of the current literature regarding the psycho-educational interventions for adolescents with type 1 diabetes.

Material and methods

Design

The researcher followed guidelines on methodology of reviews (Roe, 2007), as well as Cochrane Handbook guidelines (Higgins et al., 2019).

Search strategy and selection criteria

Electronic databases viz., PubMed, PsychINFO, Scopus-Elsevier, ISI Proceedings, Web of Science, CTRI registry in India, Medline, Google scholar and Shodhganga were searched with time limit between 2000 and February 2020 as well as limits with English language only. The search terms in databases were “adolescents”, “diabetes”, “diabetes mellitus”, “type 1 diabetes”, “intervention”, and “psycho-educational intervention”. The single as well as combination of 6 key words was used as searching strategy in this review article. Further, all the articles which are all comes under the inclusion criteria were examined and reviewed.

Inclusion and exclusion criteria

In the present study has been followed carefully about the following inclusion criteria: (1) have published between 2000 and February 2020, (2) has been published in English, (3) participants must be adolescents with type 1 diabetes mellitus, (4) subject of the studies must be adolescents with type 1 diabetes, family members involved under intervention also considered, (5) descriptive, observational (prospective or retrospective cohort study, case-control study, cross-sectional study), experimental or quasi-experimental, and randomized controlled trial were considered eligible, (6) meta-analysis review article also included.

The following exclusion criteria have been adopted in this study: (1) adolescent with mental illness, (2) psychometric studies developing or testing intervention, diabetes related patient scales or tests, and (3) studies lacking full text accessibility also excluded from the study.

Search results

While entered the keywords into databases, 58 studies were found and the selected articles were reviewed under two phases. In the first phase, researcher reviewed the abstract of articles and removed the articles which were not matched in the inclusion criteria. At the end of the first phase, researcher finalized 23 studies. Further, in the second phase, researcher read the full-texts of selected articles and those articles that did not meet the inclusion criteria were excluded again. Hence, finally, 14 articles only met with the required criteria which include 4 reviews article in different intervention for type 1 diabetes. Such articles have been selected for further research process. All the selected articles have been published in English language which was listed in Table 1.

Table 1:

Author(s)	Purpose	Sample size	Data collection methods	Research Design	Instrument	Outcomes
Pendley et al., (2002)	To examine social support and peer and family involvement in relation to diabetes management	68	Self-report	Descriptive survey design	The self-Care Inventory (SCI)	Regular peer support could have in facilitating successful diabetes management. Youth perceptions of greater family support were associated with greater parent report of diabetes-related conflict.
					The Diabetes Responsibility and Conflict Scale (DRC)	
					The Diabetes Social Support Interview (DSSI)	
					The Diabetes Patient Knowledge Test (DPKT)	
Murphy, Rayman & Skinner (2006)	This study reviewed on diabetes education programmes developed for children, young people and their families in the past 5 years	-	Database search	Systematic review	Psycho-educational intervention	Education appears to be most effective when integrated into routine care, parental involvement is encouraged, and when adolescent self-efficacy is promoted.

Mulvaney et al., (2010)	To examine the problem-solving and self-management skills improve the experimental group through online intervention	72	Internet-based self-report	Randomized control group design	Internet-based intervention program	A brief Internet-based self-management intervention was effective at improving problem solving and self-management and appeared to offset the typical adolescent increase in A1C.
					Diabetes behaviour rating scale (DBRS)	
					Diabetes Problem Solving Behaviours Scale (DPSBS)	
Abualula, Jacobsen, Milligan, Rodan, & Conn (2016)	To evaluate the effectiveness of diabetes self-management education (DSME) interventions with a skills development component on the QOL of adolescents with type 1 diabetes mellitus	-	Database search	Systematic review	The quality of assessment tool for quantitative studies (QATQS)	Educational interventions with an indirect behavioural skills development that facilitates diabetes management may improve Quality of Life among adolescents with type 1 diabetes.
AlBuhairan et al., (2016)	To measure the health related quality of life among adolescents with type 1 diabetes mellitus	315	Self-report	Cross sectional survey study	The pediatric quality of life inventory (Peds QL) diabetes module 3.0	This study emphasizes the importance of an interdisciplinary, biopsychosocial and family centred care approach to adolescents with diabetes.
					Family impact module	

Wang, Stewart, Tuli, & White (2008)	To evaluate that the diabetes medical camp would have impact on adolescents disease based knowledge and self-management.	183	Medical records	Retrospective study design	HbA1c level Beck depression inventory (BDI) Personal Adjustment and Role Skills Scale III (PARS-III)	Attending Medical Camp is associated with improved glycemic control and parent-reported adherence and adjustment in adolescents with type 1 diabetes.
Grey, Boland, Davidson, Li, & Tamborlane, (2000)	To determine whether initial effects on metabolic control and quality of life associated with a behavioural intervention combined with intensive diabetes management (IDM) can be sustained over 1 year in youth implementing intensive therapy regimens.	77	Intervention followed by Self-report questionnaire	Interventional study	Coping Skills Training Interventions The self-efficacy for diabetes scale Children Depression Inventory Diabetes life satisfaction scale	Behavioural intervention to Intensive Diabetes Management in adolescence results in improved metabolic control and quality of life.
Pansier, & Schulz, (2015)	To address the outcome of diabetes intervention implemented in schools	-	Database search	Systematic review	Intervention	This systematic literature review has shown an increase in school based diabetes interventions since 2005 in response to the

						rising prevalence of diabetes in children and the higher global attention given to the diabetes burden.
Greco, Pendley, McDonell, & Reeves, (2001)	To plan and execute an organized intervention for coordination with peers into diabetes care in a healthy and versatile manner	42	Intervention followed by Self-report questionnaire	Pre and post Interventional study	Intervention module	Peer group intervention approaches result with increased positive peer involvement in adolescents' diabetes care.
					Diabetes social support inventory	
					Diabetes education and support assessment tool (DESAT)	
Han et al., (2015)	To examine the effect of text-messages about symptom awareness and diabetes knowledge on glucose control and quality of life	30	Intervention after Self-report	Pre and post study	Symptom Text-message questions	Adolescents with type 1 diabetes benefit from text-messaging system and also improved their quality of life.
					Problem Areas in Diabetes Questionnaire	
					Diabetes quality of life for youth	
Jaser & White (2011)	To examine the association between the use of specific types of coping strategies	30	Self-report	Descriptive survey design	The response to stress questionnaire (RST)	Primary and secondary control coping strategies were associated with positive

	and indicators of resilience in adolescents with type 1 diabetes.				Child behaviour checklist Pediatric Quality of life questionnaire HbA1c obtained through medical record	outcomes
Murphy et al., (2012)	To evaluate the effectiveness of a family-centred group education programme in adolescents with Type 1 diabetes.	305	Self-report	Interventional pre and post design	FACTS intervention programme Diabetes Quality of Life Youth Scale Health Behaviour in School Children Diabetes Family Responsibility Questionnaire (DFRQ) Problem Areas in Diabetes (PAID)	No changes in diabetes family responsibility as well as no effect on biomedical outcomes. The education provided is not sufficient for families to integrate the demands of intensive insulin therapy into their daily lives.
Northam, Todd, & Cameron, (2006)	To identify effective interventions for use with	-	Database search	Systematic review study	Intervention	No study has targeted a specific psychological disorder which

	children at risk for adverse mental and physical health outcomes.					are known to be increased in children with diabetes.
Channon, Smith, & Gregory, (2003)	To identify the impact of motivational interviewing, a counselling approach to behavior change, on glycemic control, wellbeing, and self-care of adolescents with diabetes.	22	Intervention followed by self-report	Interventional pre and post design	Intervention	Motivational interviewing session is one of the useful intervention model to helping adolescents for improve their glycemic control.
					Wellbeing questionnaire	
					Diabetes knowledge Scale	
					Summary of Diabetes Self-care Activities	
					Personal models of Diabetes Questionnaire	
					Family Adaptability and Cohesion Evaluation scale	
					Diabetes family behaviour scale	

Discussion

Table 1 summarizes the characteristics and results of the reviewed interventions. Nine studies offered psychoeducational intervention program at varied names viz., diabetes program, internet based intervention, self-management education, behavioural intervention, medical camp intervention, school based diabetes intervention, peer group intervention, FACTS intervention and Text-message program. In these studies, some of the intervention programs are structured and some are unstructured. Very few study only have theoretical background that the intervention developed as based on theories like social cognitive theory, behavioural theory. One of these studies focused on coping skills training but did not clearly state the skill was targeted as outcome for the intervention. In addition, the objective of the intervention programs has been varied by each study. These studies mainly focused on direct and indirect behavioural modification, improving adolescents' quality of life (QOL), glycemic control, encouraging parental involvement, and increasing positive peer group involvement in diabetes care.

This systematic review revealed that there are various types of psycho-educational interventions were implemented to adolescents with type 1 diabetes mellitus. It also contains wide range of modules with diverse skill components. It creates more difficult to determine which were most effective in improving adolescents' quality of life as well as illness based adjustments. The review showed that successful interventions were provided a combination of direct and indirect behavioural skills, viz., stress management, coping strategies, problem solving, and self-efficacy, psychoeducation about diabetes symptoms, which also involves adjustments. This may helpful to develop mental strength of the adolescents.

Adolescent with type 1 diabetes struggle with independence issues which reflect their inefficient of decision making skills. They need support to make decisions related to their

diabetes management. Also, they lack on dealing with social and emotional demands. As a result, involvement of parents and peer group in the intervention program also helpful to deal with diabetes care. Further, the recent development of online based intervention and school based psychoeducational interventions also considered the mode of implementation of the intervention. Furthermore, successful psychoeducational interventions were given to the adolescents at least two months which provided immense time to develop new or modifying behaviour. Hence, hybrid or integrative intervention is needed to get optimum benefits for adolescents with type 1 diabetes.

A limitation of this review is in the eligibility criteria of only including literature on intervention given to adolescents with type 1 diabetes mellitus. Sometimes it was likely that citations could not directly relate to psychoeducation with diabetes, so it was left out. Further, pharmacological interventions are also omitted in this study. Therefore, some important specific understanding about overall health benefits based on type 1 diabetes with adolescents might have been ignored.

Implications

As based on the review, there is a need for developing more structured integrated intervention or hybrid intervention for adolescent populations with type 1 diabetes mellitus. Also, considering theoretical background for developing interventions. The lack of studies among girl adolescents with type 1 diabetes. Family and peer group involvement is important to improve treatment outcomes and overall psychological wellbeing.

Conclusion

This systematic review conducted to determine the effective intervention for adolescents with type 1 diabetes along with overview of current literature on the same. It was

found that the majority of the studies were found intervention based with varied skill components. Online based intervention and school based intervention as recent trend on implementing intervention to adolescents with type 1 diabetes. More experimental and qualitative studies with adolescents in India, specifically Tamil Nadu should be needed in future. Furthermore, interventional studies involved with family members, peer groups as well as girl adolescents with type 1 diabetes should be needed at large. These would be increasing more understanding about illness as well as patients' care.

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