Self-esteem and illness self-concept in emerging adults with Type 1 diabetes: Long-term associations with problem areas in diabetes

Koen Luyckx¹, Jessica Rassart¹, Isabelle Aujoulat², Liesbet Goubert³ and Ilse Weets⁴

Abstract
This long-term prospective study examined whether illness self-concept (or the degree to which chronic illness becomes integrated in the self) mediated the pathway from self-esteem to problem areas in diabetes in emerging adults with Type 1 diabetes. Having a central illness self-concept (i.e. feeling overwhelmed by diabetes) was found to relate to lower self-esteem, and more treatment, food, emotional, and social support problems. Furthermore, path analyses indicated that self-esteem was negatively related to both levels and relative changes in these problem areas in diabetes over a period of 5 years. Illness self-concept fully mediated these associations.

Keywords
emerging adulthood, illness self-concept, longitudinal, self-esteem, Type 1 diabetes

Individuals with a chronic illness such as Type 1 diabetes must not only adhere to treatment guidelines and induce lifestyle changes, they also have to reconcile the illness with their sense of self (Charmaz, 1983). Due to the postponement of adult role attainments in Western societies, emerging adulthood (ages 18–30 years) nowadays represents a crucial life stage for such an evaluation of one’s self-concept (Arnett, 2000). Partially due to these developmental challenges, emerging adults with Type 1 diabetes have been identified as a high-risk group (Weissberg-Benchell et al., 2007). Consequently, research focusing on developmental tasks these young people are confronted with is much needed.

The present study focused on self-esteem (being a global evaluation of one’s sense of self; Rosenberg, 1965) and the extent to which Type 1 diabetes becomes integrated in emerging adults’ self-definition. Self-esteem undergoes substantial changes through adolescence. Cognitive maturation gradually allows adolescents to arrive at balanced and stable self-views (Harter, 1999). By the time individuals make the transition to adulthood, they increasingly
rely on their own self-standards that govern personal choices. Longitudinal data confirmed that self-esteem increases through adolescence and the transition to adulthood (Erol and Orth, 2011). Although researchers have investigated various psychosocial factors in Type 1 diabetes, little longitudinal research has focused explicitly on self-esteem in predicting psychosocial functioning (Johnston-Brooks et al., 2002). However, in community research, self-esteem has been demonstrated to facilitate optimal psychosocial functioning (Donnellan et al., 2011). Hence, a detailed inquiry into the role of self-esteem towards illness functioning, operationalized as affective, social, food-, and treatment-related problem areas in diabetes in the present study is urgently needed in individuals with diabetes.

Besides investigating generic feelings of self-esteem, it is crucial to examine how Type 1 diabetes impacts one’s sense of self. Morea et al. (2008) introduced illness self-concept to assess the extent to which chronic illness plays a role in one’s self-definition. When chronic illness plays a central role, it constitutes a fundamental force intruding upon different life domains and is associated with hopelessness, decreased self-efficacy, and poor adjustment (Abraido-Lanza and Revenson, 2006). This notion is similar to the concept of engulfment which captures the degree to which one’s self-concept is dominated by chronic illness (Beanlands et al., 2003; Gannon et al., 2004). Conversely, when Type 1 diabetes plays a less central or peripheral role in one’s self-definition, it may constitute a constructive challenge instead of an overwhelming burden. This notion is similar to the concepts of diabetes integration and illness acceptance (Casier et al., 2008) which capture the degree to which one accepts diabetes as part of one’s self without feeling reduced to being “a diabetic” (Karademas et al., 2009).

Illness self-concept consists of three interrelated components (Morea et al., 2008): directionality (the extent to which one’s goals and actions are predominantly interpreted in light of the illness), pervasiveness (the extent to which different life domains are affected by the illness), and illness self-consciousness (the extent to which individuals are preoccupied with their illness). Individuals scoring high on illness self-concept predominantly define themselves in terms of their illness. Scoring low on illness self-concept allows individuals to retain a differentiated self-concept in which illness occupies a less dominant role, relatively separate from other self-attributes (Beanlands et al., 2003; Charmaz, 1987). Type 1 diabetes needs to become integrated in one’s self-concept (instead of being rejected as part of one’s self) but must not dominate all other aspects of the self. In other words, Type 1 diabetes needs to become part of, but not all of, who individuals perceive they are in order for them to consolidate their self-definition so that it can contribute to optimal functioning (Tilden et al., 2005).

The present study was guided by two main objectives. First, we examined whether global self-esteem predicted treatment, food, emotional, and social support problems in diabetes. A prospective design was used in which self-esteem was assessed at baseline and problem areas in diabetes at baseline and 5 years later. In line with previous research (Johnston-Brooks et al., 2002; Stewart and Yuen, 2011; Yi-Frazier et al., 2013), it was hypothesized that self-esteem would be related to lower scores on problem areas in diabetes and to relative decreases in these scores over time.

Second, this study investigated whether illness self-concept functioned as a mediator of these associations. Emerging adults with a lowered self-esteem would be vulnerable for chronic illness to take over their self-definition and, hence, for a central illness self-concept (Charmaz, 1983). If individuals lack a positively valued self, they may lack the stable internal base to integrate the illness in their self-definition without being overwhelmed. Type 1 diabetes may become the prevailing part of the self-definition, potentially resulting in a “diminished self” (Tilden et al., 2005). Conversely, when individuals have a positive self-view, they have inner resources at their disposal to cope with Type 1 diabetes (Luyckx et al., 2008),
making it less intrusive to the self. A central illness self-concept, in turn, would be related to more problem areas in diabetes (Morea et al., 2008). Finally, the role of sex, illness duration, and A1C-levels (as an index of glycemic control) was examined. Problem areas in diabetes have been related to A1C-levels and illness duration and have been found to be more prevalent in women (Ludman et al., 2004). Similarly, women can be expected to score higher on illness self-concept due to their greater concern for health-related issues and their greater inclination to adopt the sick role (Helgeson and Novak, 2007). Furthermore, Type 1 diabetes might get more accepted as part of one’s self with increasing illness duration (Janzen Claude et al., 2014; Sparud-Lundin et al., 2010).

Methods

Participants and procedure

From 1989 to 2006, the Belgian Diabetes Registry prospectively registered 5559 diabetic patients aged 0–39 years. In 2007, 1111 individuals fulfilled following criteria: (1) Dutch-speaking, (2) Type 1 diabetes, (3) between 18 and 30 years, and (4) availability of address. The first 500 individuals registered were invited to participate. They were sent a questionnaire packet also including an information letter and informed consent. Three weeks later, non-responders were sent a reminder letter. All participants received a small gift voucher. The study was approved by the Internal Review Board at KU Leuven, and all participants signed an informed consent.

A total of 197 patients (116 women) returned completed questionnaires (39% participation). Mean age was 23.62 years (standard deviation (SD) = 3.65); 34% were in college, 56% were employed full- or part-time, and 10% were unemployed. Nearly half of the sample (48%) was married, living together with a partner, or involved in a partner relationship, whereas the remaining participants had no partner or were living with their parents. Mean age at diagnosis was 15.88 years (SD = 6.04; range 2–28 years).

Treating physicians of participants were contacted to obtain A1C-values from the patients’ medical records that were closest to the date the patients filled out the questionnaires. Because different methods and laboratories were used to determine these A1C-values, these values were expressed in SD relative to the mean of their respective reference intervals. Data on A1C were obtained from 165 patients who did not differ on age, sex, and illness duration from remaining participants.

Patients who participated in 2007 were contacted 5 years later for follow-up using the same procedure as outlined previously. Ten individuals could not be contacted because new contact details were not available, limiting our sample to 187 individuals. A total of 110 individuals participated at Time 2 (59% participation) and, as a result, 17% of the data at the scale level were missing across time for these 187 patients. Those who participated at Time 1 were more likely to be female as compared to those who dropped out ($\chi^2(1) = 4.47$, $p < .05$). No differences emerged in mean age ($F(1,185) = 1.34$, $ns$, $\eta^2 = .01$) or illness duration ($F(1,184) = 0.32$, $ns$, $\eta^2 = .00$). Furthermore, a non-significant Little’s (1988) Missing Completely at Random test ($\chi^2(58) = 47.25$, $ns$) indicated that all missing values could be reliably estimated using the expectation maximization algorithm. Hence, all analyses could be performed on the 187 individuals. As suggested by Kline (2006) and Loehlin (1992), this number of participants is sufficient to estimate less complex path models such as the ones tested herein.

Measures

Self-esteem. Self-esteem at Time 1 was measured using the Rosenberg (1965) Self-Esteem Scale (RSES). This scale contains 10 items on a 4-point Likert-type scale, ranging from 1 (“does not apply to me at all”) to 4 (“applies to me very well”). A sample item is “I feel that I have a number of good qualities.” A higher score indicates a higher level of self-esteem. Cronbach’s alpha was .91.
Problem areas in diabetes. The Problem Areas in Diabetes Scale (Polonsky et al., 1995) was used to assess diabetes-related emotional (12 items), treatment (3 items), food (3 items), and social support problems (2 items) at Times 1 and 2. Each item was measured on a 5-point Likert-type scale, ranging from 1 (“no problem at all”) to 5 (“a huge problem”). Sample items include “Feeling scared when you think about living with diabetes” (emotional), “Feeling discouraged with your diabetes regimen” (treatment), “Feelings of deprivation regarding food and meals” (food), and “Feeling alone with diabetes” (social support problems). Higher scores point to a higher perceived burden of diabetes. Cronbach’s alphas for emotional, treatment, and food problems were .90, .61, and .78 at Time 1 and .92, .66, and .77 at Time 2, respectively. The inter-item correlation for the two social support problems items was .58 at Time 1 and .63 at Time 2 (ps < .001).

Illness self-concept. Illness self-concept at Time 2 was measured using the Illness Self-Concept Scale (ISCS; Morea et al., 2008). All 23 items were measured on a 6-point Likert-type scale, ranging from 1 (“strongly disagree”) to 6 (“strongly agree”). A sample item reads “I am preoccupied with my illness.” This measure was translated into Dutch using the translation/back-translation procedure. Three Dutch-speaking researchers translated the questionnaire into Dutch. Differences in translations were discussed and disagreements were resolved through consensus. Next, items were translated back into English and an independent person matched the original and the back-translated items. Correct matching was achieved for all items. Confirmatory Factor Analysis (CFA) using Mplus version 5 (Muthén and Muthén, 2002) was used to check its factor structure. To evaluate model fit, we relied on several fit indices using cut-offs forwarded by Kline (2006). The chi-squared index ($\chi^2$) should be as small as possible and preferably non-significant. However, to reduce the sensitivity of $\chi^2$ to sample size, we relied on the normed $\chi^2$ (i.e. $\chi^2$ divided by the degrees of freedom ($df$)) with values below 3 indicating reasonable fit. The Root Mean Square Error of Approximation (RMSEA) values in terms of fit are as follows: good (< .05), acceptable (.05–.08), marginal (.08–.10), and poor (> .10). Comparative Fit Index (CFI) values range from 0 to 1 with values of .90 or higher and .95 or higher representing adequate and good model fit, respectively. Finally, the Standardized Root Mean Square Residual (SRMR) should be less than .10 for adequate fit. CFA indicated that the one-factor model (including five error correlations between pairs of similarly worded items) fit the data reasonably, $df = 225, \chi^2 = 749.17$ ($p < .001$), normed $\chi^2 = 3.30$, RMSEA = .071, CFI = .900, SRMR = .049. A higher score points to a more central illness self-concept. Cronbach’s alpha was .94.

Statistical analyses
Path analysis with observed variables was used. We followed the analytic procedures recommended by Holmbeck (1997) to test for mediation. Specifically, three models were estimated: (a) a direct effects model including self-esteem at Time 1 as predictor of problem areas in diabetes at Time 2; (b) a full mediation model in which self-esteem at Time 1 was indirectly related to problem areas in diabetes at Time 2 through illness self-concept at Time 2; and (c) a partial mediation model including direct paths from self-esteem at Time 1 to problem areas in diabetes at Time 2, and indirect paths through illness self-concept at Time 2. Full mediation is demonstrated when the addition of the direct paths does not improve model fit. The significance of all indirect effects was tested.

Next, we controlled for auto-regressive stability paths in problem areas in diabetes. Hence, whereas previous models investigated whether illness self-concept at Time 2 functioned as a mediator in the pathway from self-esteem at Time 1 to levels of problem areas in diabetes at Time 2, these models investigated whether illness self-concept functioned as a mediator in the pathway from self-esteem to relative changes in problem areas in diabetes over time. In all
models, sex and A1C-values at Time 1 were controlled for by estimating paths to each of the constructs in the model. For both sets of models, we conducted a multi-group analysis to examine whether the directional path coefficients were invariant for men and women. A constrained model (with coefficients set equal across sex) was compared with an unconstrained model (with coefficients allowed to vary across sex). The null hypothesis of invariant path coefficients across sex would be rejected if, relative to the df, $\Delta \chi^2$ would be significant at $p < .05$.

**Results**

**Mean-level and correlational analyses**

To examine sex differences, one-way multivariate analyses of variance (MANOVA) were conducted with sex as fixed factor and all variables at Times 1 and 2, respectively, as dependent variables. A multivariate effect of sex was found at Time 1 (Wilks’ $\lambda = .93$; $F(5, 181) = 2.80; p < .05$) but not Time 2 (Wilks’ $\lambda = .97$; $F(5, 181) = .97$; $ns$). At Time 1, men scored higher than women on self-esteem ($M = 3.41, SD = 0.52$; and $M = 3.17, SD = 0.65$, respectively) and lower on treatment ($M = 1.63, SD = 0.74$; and $M = 1.90, SD = 0.83$, respectively) and emotional problems ($M = 2.01, SD = 0.69$; and $M = 2.38, SD = 0.83$, respectively).

Table 1 presents correlations among the variables at Times 1–2. Self-esteem at Time 1 was negatively related to all variables. Illness self-concept at Time 2 was positively related to all problem areas at Times 1–2. Finally, all problem areas at Times 1–2 were positively interrelated. Age and illness duration were not related to any of these variables. A1C-values at Time 1 were positively related to treatment problems at Time 1 ($r = .40, p < .001$) and Time 2 ($r = .19, p < .01$), food problems at Time 1 ($r = .18, p < .01$), emotional problems at Time 1 ($r = .21, p < .01$) and Time 2 ($r = .19, p < .01$), social problems at Time 1 ($r = .17, p < .05$) and Time 2 ($r = .16, p < .05$), and illness self-concept at Time 2 ($r = .19, p < .01$). Sex and A1C-values were controlled for in all path analyses.

Table 1. Descriptive statistics and correlations among the study variables.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-esteem T1</td>
<td>3.27 (0.61)</td>
<td>- .32***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment problems T1</td>
<td>1.80 (0.80)</td>
<td>.54***</td>
<td>.37***</td>
<td>-.39***</td>
<td>.18*</td>
<td>-.28***</td>
<td>.27***</td>
<td>-.39***</td>
<td>.18*</td>
<td>-.28***</td>
</tr>
<tr>
<td>Food problems T1</td>
<td>2.22 (0.97)</td>
<td>-.32***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional problems T1</td>
<td>2.23 (0.80)</td>
<td>.54***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social problems T1</td>
<td>1.52 (0.78)</td>
<td>-.37***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment problems T2</td>
<td>2.13 (0.78)</td>
<td>.54***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food problems T2</td>
<td>1.75 (0.58)</td>
<td>-.37***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional problems T2</td>
<td>2.07 (0.73)</td>
<td>.54***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social problems T2</td>
<td>1.17 (0.69)</td>
<td>-.32***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illness self-concept T2</td>
<td>1.87 (0.70)</td>
<td>-.37***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Mediation analyses: predicting levels of problem areas in diabetes at Time 2

First, the direct effects model was saturated (i.e. $0 df$). In this model, self-esteem at Time 1 negatively predicted food ($\beta = -0.26$, $p < .001$), emotional ($\beta = -0.23$, $p < .001$), social ($\beta = -0.29$, $p < .001$), and treatment problems ($\beta = -0.15$, $p < .05$) at Time 2. Second, the partial mediation model was saturated but all direct paths from self-esteem at Time 1 to problem areas at Time 2 were non-significant. Hence, the full mediation model provided a more parsimonious account of the data and provided an excellent fit, $df = 4$, $\chi^2 = 4.23$ (ns), normed $\chi^2 = 1.06$, RMSEA = .017, CFI = 1.000, and SRMR = .013.

Self-esteem at Time 1 negatively predicted illness self-concept at Time 2 ($\beta = -0.33$, $p < .001$) which, in turn, positively predicted all problem areas at Time 2 (food problems: $\beta = .66$; treatment problems: $\beta = .49$; emotional problems: $\beta = .73$; and social support problems: $\beta = .62$; all $p s < .001$). Percentages of explained variances ($R^2$) in this full mediation model corresponded to .15, .44, .26, .57, and .40, respectively. Additional analyses demonstrated that all indirect paths from self-esteem at Time 1 to problem areas in diabetes at Time 2 via illness self-concept at Time 2 were significant (at $p < .01$). Ancillary multi-group analyses indicated that all directional pathways in the full mediational model were invariant for men and women ($\Delta \chi^2(5) = 4.15$, $p = .53$).

Mediation analyses: predicting relative changes in problem areas in diabetes over time

First, the direct effects model had an adequate fit ($df = 12$, $\chi^2 = 28.73$ ($p < .01$), normed $\chi^2 = 2.14$, RMSEA = .086, CFI = .967, and SRMR = .060) and indicated that when controlling for all auto-regressive stability paths in problem areas in diabetes, self-esteem at Time 1 predicted relative decreases in food problems ($\beta = -0.16$, $p < .05$) and social problems ($\beta = -0.21$, $p < .01$) over time. Second, the partial mediation model had an adequate fit ($df = 16$, $\chi^2 = 43.91$ ($p < .01$), normed $\chi^2 = 2.74$, RMSEA = .097, CFI = .958, and SRMR = .079). Again, all direct paths from self-esteem at Time 1 to problem areas in diabetes at Time 2 were non-significant. Hence, the full mediation model provided a more parsimonious account of the data ($df = 20$, $\chi^2 = 51.77$ ($p < .001$), normed $\chi^2 = 2.59$, RMSEA = .092, CFI = .953, and SRMR = .078), and a chi-square difference test revealed that the full mediation model provided a comparable fit as the partial mediation model ($\Delta \chi^2(4) = 7.86$, $p = .10$).

As shown in Figure 1, self-esteem at Time 1 negatively predicted illness self-concept at Time 2 which, in turn, predicted relative increases in all four problem areas over time. Additional analyses demonstrated that all indirect paths from self-esteem at Time 1 to changes in problem areas in diabetes over time via illness self-concept at Time 2 were significant (at $p < .01$). Again, multi-group analyses indicated that the directional paths in the full mediational model were invariant for men and women ($\Delta \chi^2(5) = 5.76$, $p = .33$).

Discussion

This 5-year prospective study generated important information on how self-esteem influences several problem areas over time in emerging adults with Type 1 diabetes. Furthermore, illness self-concept (or the degree to which one’s illness is central to or intrudes upon one’s self-concept) constituted an important mediating mechanism. More specifically, low levels of self-esteem were associated with a more central illness self-concept 5 years later which, in turn, was associated with high levels of problem areas in diabetes. All pathways were obtained when controlling for sex and baseline levels of glycemic control (age and illness duration were not related to the study variables). Furthermore, none of the directional pathways were moderated by sex, indicating that all directional pathways were similar for men and women.
Emerging adults with higher levels of self-esteem were better equipped to cope with the daily challenges of having diabetes, as evidenced by lower scores on several problem areas in diabetes 5 years later. Previous research already testified to the importance of self-efficacy (or the cognitive perception of one’s abilities) as an important factor towards self-care behaviors and physiological outcomes in Type 1 diabetes (Johnston-Brooks et al., 2002). The present study adds to these findings by identifying self-esteem (or the subjective evaluation of one’s self) as an important factor towards problem areas in diabetes in these patients.

Second, this study identified a specific intervening mechanism which could explain why self-esteem had such predictive value for experienced problem areas in diabetes. As expected, scoring low on global self-esteem was found to function as a vulnerability factor for a more central illness self-concept 5 years later (i.e. a self-concept in which Type 1 diabetes takes on a dominant role). Individuals who lack a positively valued self might indeed commit prematurely to the identity label or sick role of “being a diabetic,” further constricting and compromising their sense of self and reducing the attainment of alternative social roles (Beanlands et al., 2003; Clarke et al., 2010; Morea et al., 2008). However, although these generic and illness-specific self-related processes combined accounted for a considerable amount of variance in problem areas of diabetes, future research should continue to explore the added value of other self- and personality-related assets for illness functioning. The self is a multi-layered construct (McAdams and Olson, 2010) with different layers having important implications for illness functioning. For instance, both more stable and enduring personality traits as more malleable illness perceptions

\[
\begin{align*}
& \text{Food problems T1} \\
& \text{Treatment problems T1} \\
& \text{Emotional problems T1} \\
& \text{Social problems T1} \\
& \text{Self-esteem T1} \\
& \text{Illness self-concept T2} \\
& R^2 = .45 \\
& R^2 = .27 \\
& R^2 = .58 \\
& R^2 = .41 \\
& R^2 = .15
\end{align*}
\]

\[.27^{***} \]
\[.12^{†} \]
\[.21^{***} \]
\[.20^{***} \]
\[-.33^{***} \]

\[R^2 = .45 \]
\[R^2 = .27 \]
\[R^2 = .58 \]
\[R^2 = .41 \]
\[R^2 = .15 \]

\[†p < .10; **p < .001. \]

Figure 1. Full mediation model linking self-esteem at Time 1 to illness adaptation at Time 2 (controlled for illness adaptation at Time 1) through illness self-concept at Time 2. Within-time correlations at Time 1 and at Time 2 and paths from the control variables at Time 1 (sex and A1C-values) are not presented for reasons of clarity. All path coefficients are standardized. T = Time.
have been shown to predict problem areas in diabetes (Rassart et al., 2014). Hence, integrative and longitudinal research efforts focusing on unique predictive pathways from various self- and personality-related assets towards illness functioning are urgently needed.

The finding that self-esteem was a predictor of illness self-concept (with individuals scoring high on self-esteem being more able to contain the illness by not letting it intrude into their self-definition) further testifies to the facilitative role of self-esteem towards illness functioning (Donnellan et al., 2011). The present findings indicate that individuals’ self-esteem does matter not only when it comes to affective and psychosocial illness functioning, but also to giving Type 1 diabetes a proper place in one’s life and self-definition. The present findings might also help in further characterizing those emerging adults with Type 1 diabetes who experience substantial problems in monitoring and regulating their illness and, more specifically, their glucose levels (Bryden et al., 2003). The present findings indicated that A1C-values at baseline were positively related to illness self-concept. Such a finding needs to be emphasized because of the relationship between glycemic control values and long-term morbidity and mortality (Diabetes Control and Complications Trial Research Group (DCCT), 1993). Hence, future longitudinal research should examine whether the development of illness self-concept (and, by extension, generic self-related processes and self-esteem) could function as a potential resource for obtaining optimal glycemic control over time.

**Clinical implications**

The present findings suggest that interventions should focus on generic and illness-specific self-related processes simultaneously in improving affective and psychosocial illness functioning. Hence, self-related variables could function as potential targets in diabetes education and treatment. However, for such interventions to be effective, multifaceted efforts are needed that also target issues of self-efficacy, pro-active coping strategies, as well as interpersonal relationships (Swann et al., 2007). Furthermore, these interventions should aim at cultivating high secure self-esteem (instead of a fragile or contingent sense of self-esteem) which should lead to more definitive links between self-esteem and various outcomes (Heppner and Kernis, 2011). In those cases where individuals have a central illness self-concept, it may be advisable to challenge the dominant and intrusive role Type 1 diabetes plays in their self-concept. If emerging adults are taught to attain a differentiated self-concept, they might be better equipped to form strong and stable self-views outside the realm of chronic illness. Such self-views might provide a strong base for secure self-esteem and, consequently, render them less vulnerable for being engulfed by diabetes and the challenges it poses. Hence, these findings call for tailored and multidisciplinary care that is attuned to the developmental needs of emerging adult patients (Weissberg-Benchell et al., 2007). Due to the fact that self-related issues already come to the fore at adolescence, intervention efforts that also involve the primary caregivers of adolescents should be initiated already before individuals make the transition to adulthood.

**Limitations and suggestions for future research**

This study is characterized by some limitations. First, future research using larger samples is needed, especially given the relatively low participation rate at Time 1. Such a low participation rate might introduce a sample bias because individuals with especially low scores on self-esteem or individuals experiencing severe problems with managing their diabetes might be underrepresented. Such future research should also include other chronic illnesses to examine the degree to which the present findings generalize across different diagnostic categories. Larger samples should be used which allows for testing more complex path analytical models. Second, although this study was characterized by a
prospective design, a full-fledged longitudinal design in which all variables are assessed at multiple time-points is needed to make more definite claims with respect to directionality of effect and mediation. For instance, in this study, self-esteem was conceptualized as an antecedent of illness self-concept. However self-related processes are in development especially through adolescence and emerging adulthood. Hence, illness self-concept could very well influence feelings of self-esteem (Aujoulat et al., 2008). Third, data were gathered only through self-report questionnaires. Although questionnaires are most appropriate to gather information about internal and subjective processes such as self-esteem, the use of a single informant may artificially inflate correlations among constructs or may invoke some degree of response bias. Hence, future research should rely on other sources of data collection (such as reports from peers or romantic partners) as well.

Conclusion

This study adds to our knowledge on the mechanisms through which Type 1 diabetes can become integrated into one’s self-definition in a pro-active (“I am a person with diabetes”) instead of an intrusive way (“I am a diabetic”). The finding that illness self-concept mediates the association between self-esteem and problem areas in diabetes emphasizes the need for clinicians to focus on both generic and illness-specific self-related processes in optimizing illness functioning in individuals with Type 1 diabetes on the challenging road to adulthood.

Funding

Funding was partially provided through grant OT/11/033 from the Research Fund-KU Leuven (Belgium).

References


