Determinants of Restrictive Dietary Behaviors among Female High School Athletes

Éliane Morissette, MSc, RD
Catherine Laramée, MSc, RD
Vicky Drapeau, PhD, RD
Steven Couture, MSc, RD
Pierre Valois, PhD
Claude Goulet, PhD
Véronique Provencher, PhD, RD
Benoit Lamarche, PhD

Objectives: This study assessed the determinants of intention to adopt restrictive dietary behaviors to lose weight among high school female athletes. Methods: Female athletes (N = 255) and non-athlete controls (N = 91) completed a questionnaire based on the theory of planned behavior. Results: Intention to adopt restrictive dietary behaviors to lose weight, which had a prevalence of 22%-29% among athletes and controls, was correlated primarily with attitude towards this behavior ($R^2 = 45\%$, $p < .0001$). Attitude was in turn correlated with improvement in appearance ($R^2 = 37\%$, $p < .0001$). Conclusions: Improvement in appearance is a key belief to address in interventions aimed at decreasing the intention to use restrictive dietary behaviors to lose weight among adolescent female athletes.

Key words: high school female athletes; restrictive dietary behaviors; weight concern; theory of planned behavior

DOI: http://dx.doi.org/10.14485/HBPR.2.5.6

Several unhealthy behaviors occur on the continuum of disordered eating (DE). The continuum starts with less severe behaviors such as restrictive dietary strategies, which may progress to more severe eating behaviors such as self-induced vomiting, diet pill use, as well as laxative and diuretic use. Ultimately, these behaviors may lead to clinical eating disorders such as anorexia nervosa (AN), bulimia nervosa (BN) and eating disorder not otherwise specified (EDNOS). A significant proportion of high school female athletes as well as other adolescent girls engage in DE behaviors, reaching values as high as 40%. Whether participating in a sport protects against or increases the risk of developing DE behaviors is controversial, partly due to the fact that the association is influenced by many confounding factors such as age, competition level, and type of sport practiced. Data suggest that DE behaviors are more prevalent among female elite athletes involved in sports that emphasize leanness, such as aesthetic, endurance and weight-class sports, than among non-elite female athletes involved in sports that do not emphasize leanness. Adolescent girls showing DE behaviors appear to be at increased risk for DE in adulthood. This has emphasized the importance of developing intervention programs aimed at preventing DE patterns at a young age, at least in young non-athlete girls. Considering that DE behaviors are not without consequences on athletic performance, physiological and psychological health, many authors are convinced that developing a targeted intervention for female athletes is also a necessity.
Since its introduction in 1985, the theory of planned behavior (TPB) has shown its efficacy in terms of predicting human social behaviors. The TPB implies that the intention to perform a particular behavior is considered the strongest predictor of this behavior. Intention is influenced by 3 independent determinants: (1) attitude toward this behavior, which refers to the positive or negative evaluation of the behavior; (2) subjective norm, which is the perceived social pressure to perform or not perform the behavior; and (3) perceived behavioral control, which reflects the perceived ease or difficulty to perform the behavior. According to Ajzen, it is essential to identify psychosocial determinants of intention and their underlying beliefs in the process leading to the development of an intervention. To our knowledge, no study has yet evaluated the psychosocial determinants of DE behaviors based on the TPB in a population of adolescent female athletes, with the intent to develop an intervention aimed at reducing DE behaviors.

Our study aimed to examine the prevalence of weight concerns and of intention to adopt restrictive dietary behaviors among high school female athletes mostly practicing leanness sports, compared with a control group. The second objective of this study was to identify the psychosocial determinants of the intention to adopt restrictive dietary behaviors for losing weight in high school female athletes specifically using the TPB framework. Because athletes practicing leanness sports seem at increased risk for developing DE behaviors, we hypothesize that concerns regarding body weight and the intention to adopt restrictive dietary behaviors are more prevalent among high school female athletes than among their age-matched controls. We also hypothesize that subjective norm (SN) is the most influential determinant of the intention to adopt restrictive dietary behaviors to lose weight in young female athletes because of the athletes' environmental pressure regarding body weight management.

METHODS
Participants and Procedure
Participants were athletes and non-athletes adolescent girls from 6 different high schools in the province of Québec, Canada. School offices were contacted to obtain their informed consent. Teachers and coaches were then solicited to help recruit female athletes and non-athletes aged between 12 and 17 years. Athletes had to be members of a competitive team either as part of school sport programs or outside of school at a local, regional, provincial, national or international level. Control girls were selected among students not actively involved in any sports at a competitive level. Girls who agreed to participate were asked to complete a Web-based questionnaire and had their height and weight measured by a trained research professional. Written permissions were obtained from all girls (assent) and their parents (informed consent) before joining the study. Data were collected in spring and autumn 2011.

Instruments
A Web-based questionnaire was developed based on the TPB guidelines to assess determinants of the intention to adopt 2 a priori defined weight loss behaviors. Our questionnaire also was inspired by a previous survey that had been developed according to the TPB by 2 authors of the present study. Sociodemographic variables and a few questions regarding body weight concerns also were assessed to describe the study population.

The questionnaire was pilot tested with 6 adolescent girls. Minor modifications were applied according to their comments. A pre-test of the Web questionnaire and Web platform was then conducted in 14 adolescent female athletes to verify the internal consistency of the items measured. Internal consistency of each determinant of the TPB was found to be satisfactory (Cronbach alphas = .77 - .95).

Theory of planned behavior variables. The intention to use restrictive dietary behaviors for losing weight within the next 3 months was based on the following pre-determined individual behaviors: (1) avoiding dairy products; (2) skipping meals voluntarily; (3) avoiding meat products; (4) avoiding grain products; (5) skipping lunch; (6) avoiding fat; (7) avoiding sugary foods; (8) decreasing serving size; and (9) avoiding restaurants. We also measured the intention to use more extreme weight control behaviors for losing weight within the next 3 months, using the following pre-determined behaviors: (1) use of meal replacement; (2) use of natural weight loss products; (3) use of diuretics; (4) use of laxatives; (5) fasting; (6) self-induced vomiting; (7) use of ephedrine capsules; and (8) undertaking a commercial weight loss diet. These behaviors were
identified based on previous studies assessing the prevalence of restrictive dietary behaviors and more extreme weight control behaviors in a population of adolescent athletes and non-athletes.\textsuperscript{3,8,21-26} Because the prevalence of the intention to adopt more extreme weight control behaviors for losing weight was low among both athletes and controls (2\% and 1\%, respectively), only results pertaining to restrictive dietary behaviors are presented and discussed hereafter. Global intention to use restrictive dietary behaviors for losing weight was calculated as the mean score of the 9 individual behaviors.

Direct and indirect measures of attitude, subjective norm (SN), and perceived behavioral control (PBC) toward the use of restrictive dietary behaviors for losing weight in the next 3 months also were assessed using semantic differential scales and Likert scales based on the TBP guidelines.\textsuperscript{18,19} The measurement of past behavior was added to our questionnaire for each of the 9 individual behaviors by asking girls: “In the last 12 months, did you use the following behaviors for losing weight?” A mean score of the past behavior was computed using the score from the 9 individual behaviors.
Table 2
Prevalence of the Intention to Use Restrictive Dietary Behaviors for Losing Weight within the Next 3 Months in Female High School Athletes and Controls

<table>
<thead>
<tr>
<th>Variables</th>
<th>No intention (%)</th>
<th>Minimal intention (%)</th>
<th>Some intention (%)</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global intention&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controls</td>
<td>13.0</td>
<td>58.4</td>
<td>28.6</td>
<td>.13</td>
</tr>
<tr>
<td>Athletes</td>
<td>23.3</td>
<td>54.3</td>
<td>22.4</td>
<td></td>
</tr>
<tr>
<td>Avoiding dairy products&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controls</td>
<td>49.4</td>
<td>39.8</td>
<td>10.8</td>
<td>.0003</td>
</tr>
<tr>
<td>Athletes</td>
<td>71.1</td>
<td>18.6</td>
<td>10.3</td>
<td></td>
</tr>
<tr>
<td>Skipping meals voluntarily&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controls</td>
<td>68.7</td>
<td>21.7</td>
<td>9.6</td>
<td>.62</td>
</tr>
<tr>
<td>Athletes</td>
<td>74.1</td>
<td>17.3</td>
<td>8.6</td>
<td></td>
</tr>
<tr>
<td>Avoiding meat products&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controls</td>
<td>54.7</td>
<td>32.6</td>
<td>12.8</td>
<td>.03</td>
</tr>
<tr>
<td>Athletes</td>
<td>70.0</td>
<td>22.9</td>
<td>7.1</td>
<td></td>
</tr>
<tr>
<td>Avoiding grain products&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controls</td>
<td>52.3</td>
<td>29.1</td>
<td>18.6</td>
<td>.07</td>
</tr>
<tr>
<td>Athletes</td>
<td>66.1</td>
<td>21.5</td>
<td>12.4</td>
<td></td>
</tr>
<tr>
<td>Skipping lunch&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controls</td>
<td>72.9</td>
<td>18.8</td>
<td>8.2</td>
<td>.28</td>
</tr>
<tr>
<td>Athletes</td>
<td>79.4</td>
<td>11.9</td>
<td>8.6</td>
<td></td>
</tr>
<tr>
<td>Avoiding fat&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controls</td>
<td>25.0</td>
<td>29.8</td>
<td>45.2</td>
<td>.25</td>
</tr>
<tr>
<td>Athletes</td>
<td>30.0</td>
<td>21.0</td>
<td>49.0</td>
<td></td>
</tr>
<tr>
<td>Avoiding sugary foods&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controls</td>
<td>22.6</td>
<td>26.2</td>
<td>51.2</td>
<td>.26</td>
</tr>
<tr>
<td>Athletes</td>
<td>29.9</td>
<td>19.1</td>
<td>51.0</td>
<td></td>
</tr>
<tr>
<td>Decreasing serving size&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controls</td>
<td>28.9</td>
<td>31.3</td>
<td>39.8</td>
<td>.13</td>
</tr>
<tr>
<td>Athletes</td>
<td>40.3</td>
<td>22.6</td>
<td>37.0</td>
<td></td>
</tr>
<tr>
<td>Avoiding restaurants&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controls</td>
<td>29.4</td>
<td>28.2</td>
<td>42.4</td>
<td>.24</td>
</tr>
<tr>
<td>Athletes</td>
<td>39.8</td>
<td>24.3</td>
<td>36.0</td>
<td></td>
</tr>
</tbody>
</table>

Note.
N = 232-243 for athletes and N = 77-86 for controls, depending on the variables
a p values based on a chi-square test.
b Global intention based on the mean score of the nine individual restrictive dietary behaviors. Arbitrary categories based on a 6-point Likert scale are defined as follows:
No intention: score = 1
Minimal intention: score >1 and <=3
Some intention: score >3
c Arbitrary categories based on a 6-point Likert scale for each of the nine individual behaviors are defined as follows:
No intention: score = 1
Minimal intention: score = 2 or 3
Some intention: score = 4, 5 or 6
Concerns regarding body weight. Body dissatisfaction/satisfaction was determined by rating the perceived actual and the desired silhouette of each girl based on pictorial silhouettes. If the desired silhouette was smaller than the perceived actual silhouette, girls were classified as being dissatisfied with their perceived body shape, desiring to be thinner. Concerns regarding body weight also were assessed by asking: “Do you consider yourself preoccupied with your physical appearance and/or your body weight?” Finally, girls were asked: “Did you attempt to lose weight within the last 12 months?”

Data Analysis

Body mass index (BMI) was computed and classified based on the International Obesity Task Force (IOTF) growth curves. Differences between athletes and controls were assessed using unpaired Student t-tests for mean values and chi-square tests for frequency data. Arbitrary groups for intention to use each of the 9 individual restrictive dietary behaviors to lose weight were defined as follows: no intention (score=1); minimal intention (score=2 or 3); and some intention (score=4, 5 or 6). A mean score of the 9 individual behaviors was computed to assess global intention for each subject. Arbitrary groups for global intention to adopt restrictive dietary behaviors to lose weight were used.

RESULTS

A total of 255 athletes and 91 controls were included in the study. Table 1 presents the characteristics of the 2 groups. Female athletes were slightly older than non-athletes (p = .01). Although a higher percentage of controls were categorized as obese compared with athletes (p = .01), mean BMI was not statistically different between the 2 groups. All non-athletes attended public schools whereas 50%
of athletes were from private schools. Athletes represented 23 different sports, most of them emphasizing a thin body shape.

Concerns regarding body weight were similarly prevalent in athletes and controls (67% vs 72% respectively, p = .33). Body dissatisfaction regarding the desired silhouettes was also similar between groups with 38% of athletes and 36% of controls wanting to be thinner than their perceived current size (p = .27, not shown). Among athletes, cheerleaders and girls involved in aquatic sports were more dissatisfied with their silhouette than girls involved in other sports groups (p = .05, not shown). Finally, the prevalence of girls having attempted to lose weight within the last year tended to be higher among controls than among athletes (51% vs 40%, p = .08) but the proportions did not meet the criterion for statistical significance. As Table 2 shows, a similar proportion of athletes and controls were categorized as “having some intention” to use restrictive dietary behaviors for losing weight (22% vs 29% respectively, p = .13). Avoiding fat, avoiding sugary foods, avoiding restaurants, and decreasing serving size were reported by more than one-third of all subjects.

**Figure 1**
Multivariate Regression Analysis of the Determinants of the Intention to Use Restrictive Dietary Behaviors for Losing Weight among High School Female Athletes Based on the TPB Framework

![Diagram](attachment:image.png)

**Note.**
NS = not significant with p > .05
*a* Both subjective norm and perceived behavioral control did not reach the level of significance to enter the final multivariate regression model.
Determinants of Restrictive Dietary Behaviors among Female High School Athletes

All theoretical constructs of the TPB framework showed a significant positive association with intention to adopt restrictive dietary behaviors to lose weight in the athletes (Table 3). Of note, past dietary restrictive behaviors were correlated strongly with the intent to use these behaviors in the future. Multivariate regression analyses showed that attitude was the only significant determinant of the intention to adopt restrictive dietary behaviors for losing weight in the athlete group, explaining 45% ($p < .0001$) of its variance (Figure 1). Behavioral beliefs that predicted attitude towards the intention to use restrictive dietary behaviors for losing weight in athletes are shown in Table 4. Improving physical appearance explained 37% of the variance in attitude ($p < .0001$) in multivariate analyses. Negative and positive impact on health explained 7% ($p < .0001$) and 3% ($p = .0006$) respectively of the variance in attitude. Decrease in school performance explained 1% of the variance in attitude ($p = .02$).

**DISCUSSION**

The aim of our study was first to examine the prevalence of the intention to adopt restrictive dietary behaviors to lose weight and body weight concerns in a sample of high school female athletes compared to a control (non-athlete) group. We also wanted to identify the key psychosocial determinants of the intention to adopt restrictive dietary behaviors for losing weight among high school female athletes, with the intent to devise the best intervention for this group at high risk for DE.

In accordance with the literature, the intention to use restrictive dietary behaviors to lose weight was more prevalent than the intention to use extreme weight control strategies for losing weight in both athletes and controls.3,21-23 Global intention to adopt restrictive dietary behaviors to lose weight, as calculated from the score of 9 individual behaviors, was similarly prevalent in athletes and controls (22% vs 29% respectively, $p = .13$), refuting our hypothesis. One previous study has shown that similar proportions of elite female athletes (31%) and controls (27%) reported dieting in a sample aged from 12 to 35 years.23 On the other hand, dieting experiences and use of pathogenic weight

---

**Table 4**

<table>
<thead>
<tr>
<th>Behavioral beliefs</th>
<th>Univariate*</th>
<th>Multivariate*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>Standardized β (±SE)</td>
</tr>
<tr>
<td>Improves physical appearance</td>
<td>.61***</td>
<td>.27 ± .08</td>
</tr>
<tr>
<td>Has a negative impact on health</td>
<td>.43***</td>
<td>.22 ± .05</td>
</tr>
<tr>
<td>Has a positive impact on health</td>
<td>.53***</td>
<td>.15 ± .06</td>
</tr>
<tr>
<td>Decreases school performance</td>
<td>.28***</td>
<td>.11 ± .14</td>
</tr>
<tr>
<td>Improves athletic performance</td>
<td>.50***</td>
<td>NS</td>
</tr>
<tr>
<td>Improves personal confidence</td>
<td>.49***</td>
<td>NS</td>
</tr>
<tr>
<td>Helps lose weight</td>
<td>.47***</td>
<td>NS</td>
</tr>
<tr>
<td>Decreases the risk of injury</td>
<td>.34***</td>
<td>NS</td>
</tr>
<tr>
<td>Increases chances of winning during competition</td>
<td>.34***</td>
<td>NS</td>
</tr>
<tr>
<td>Helps being more accepted by others</td>
<td>.19**</td>
<td>NS</td>
</tr>
<tr>
<td>Increases the risk of injury</td>
<td>.11 NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

R² of the model = 49%; Adjusted R² = 47%

Note: N = 219; SE=standard error

* Attitude: mean score of the four questions measuring direct attitude.
  * Univariate analyses: *$p < .05$, **$p < .01$, ***$p < .001$, NS = not significant at $p < .05$.
  * Multivariate analyses: NS: these items did not reach the level of significance to enter the model.
control methods have been shown to be more prevalent among non-athletes than athletes in a sample of high school girls. Of note, the number of studies having assessed restrictive dietary practices and low energy availability specifically among high school athletes remains limited. It is also unclear whether being part of organized sports during adolescence increases, has no impact, or decreases the risk of manifesting DE behaviors.

Concern regarding body weight was highly but similarly prevalent in this sample of normal weight adolescent athletes and non-athletes, again refuting our hypothesis. Despite the fact that more than 80% of our participants were categorized as being “normal weight,” important proportions of athletes and controls were preoccupied with their body weight (67% vs 72%, respectively), reported wanting a thinner body shape (38% vs 36%, respectively) and had attempted to lose weight within the previous year (40% vs 51%, respectively). These results are consistent with previous data showing that 46% of high school cheerleaders said they were trying to lose weight even if 81% were categorized as normal weight. In this same study, 62% of girls with a normal BMI reported body dissatisfaction and 43% were terrified about being overweight. Adding support to these findings, another study reported that 70% of adolescent female athletes declared not having their desired weight. Moreover, our data suggest that athletes in more aesthetic sports could be at higher risk of body weight dissatisfaction as was reported in other studies. These data emphasize the magnitude of the problem and the importance of addressing weight dissatisfaction issue from an intervention perspective.

Social environment and pressure exerted on female athletes to be thin frequently have been cited as major risk factors for developing DE in athletes. Social norm also appears to be an important determinant of dietary choices for adolescents in general, who are highly influenced by their peers. Based on the TPB constructs, subjective norm in the present study correlated with the intent to use restrictive dietary behaviors for losing weight in univariate analysis (Table 3), but was not found to be a significant determinant in multivariate analysis (Figure 1). Indeed, attitude towards the use of restrictive dietary behaviors for losing weight among high school female athletes appeared as the only significant multivariate determinant, explaining 45% of the variance. This suggests that attitude towards using restrictive dietary behaviors for losing weight in adolescent female athletes has a stronger impact than the pressure they perceive from their social environment to adopt restrictive dietary behaviors for losing weight.

Of particular interest for developing an intervention are beliefs determining attitude toward a given behavior. Physical appearance was found to be the most influential belief, explaining 37% of the variance in attitude in adolescent female athletes. These data are consistent with results from a previous study that showed that improving physical appearance was the most cited reason (95%) to justify dieting among high school female athletes. Adolescent female athletes with a thinner body ideal have been shown to be 8 times more at risk of DE than girls having an equal or thicker body ideal. Similarly, athletes who perceived themselves as overweight are apparently at higher risk to engage in DE behaviors. Finally, “looking good” has been cited as an important factor for dieting among adolescent girls, where dieting was seen as the most efficient way of maintaining good physical appearance.

Beliefs that using restrictive dietary behaviors has no negative impact on health and, alternatively, that they may even be perceived as having a positive impact on health also contributed significantly to influencing attitude toward the use of restrictive dietary behaviors for losing weight, although to a much smaller extent than physical appearance. It is noteworthy that healthy eating and dieting are often considered synonymous among adolescent girls, with data indicating that 66% of adolescent girls who dieted thought it was good for their health. The desire to engage in healthy eating behaviors among adolescent girls has been linked more strongly with perception of weight control than with the potential beneficial impact on their health. These observations may explain why the belief that dietary restriction has a beneficial effect on health was correlated with the positive attitude towards the use of this behavior. This reveals that young female athletes have a poor understanding of how to manage body weight properly and do not appreciate the consequence relating to improper weight management and eating disorders fully. Adding support to our hypothesis, college athletes scored as little as
47% on a questionnaire assessing weight management and eating disorders issues such as safe weight loss strategies, complications from eating disorders and body composition assessment.\textsuperscript{36}

**Strength and Limitations**

Our study is unique and original because, to our knowledge, it is the first time that determinants of restrictive dietary behaviors based on the TPB are identified in a sample of high school female athletes. The relatively large sample size is also a strength. Questions measuring behavioral and normative beliefs, as well as facilitating factors and barriers were defined based on the available literature, dieticians’ personal practices, and group discussions among researchers, rather than by using focus groups. It is also important to note that we did not measure the behavior 3 months later because our objective was to identify psychosocial determinants of the intention to adopt restrictive dietary behaviors. However, the strong correlation ($r = .70$) between past behavior and intention to use restrictive dietary behaviors to lose weight suggests that these concepts possibly reflect a pattern of behaviors that are likely to be sustained over time. The possibility that DE behaviors may have been underreported in both groups cannot be excluded.\textsuperscript{37,38} Finally, the cross-sectional nature of the study does not allow us to make inferences regarding causal relationships between variables.

**Conclusions**

Using the TPB framework, we showed that attitude was the only significant determinant of the intention to adopt restrictive dietary behaviors for losing weight among young female athletes. Physical appearance to a large extent, and health-related beliefs to a lesser extent, appeared as the main underlying beliefs supporting the attitude towards female athletes’ intention to use restrictive dietary behaviors for losing weight.

**IMPLICATIONS FOR HEALTH BEHAVIOR OR POLICY**

The high prevalence of body dissatisfaction and of the intention to use restrictive dietary behaviors for losing weight in adolescent female athletes emphasize the importance of developing interventions at a young age in this population at risk, before unhealthy weight control behaviors pursue their way on the continuum of DE. Future intervention studies should focus primarily on approaches that modify the belief that using restrictive dietary behaviors for losing weight improves physical appearance.

**Human Subjects Approval Statement**

The Research Ethics Committee of Laval University approved study procedures (2010-307 A-1/10-05-2011).

**Conflict of Interest Declaration**

The Danone Institute provided funding for the study as part of their peer-reviewed, research funding program. The Danone Institute played no role in defining the study objectives or design, collection and analysis of data, the content of the paper and the decision to submit the paper for publication.

**Acknowledgements**

We thank The Danone Institute for Funding. We also thank high school directors for giving their approbation, as well as the dedicated work of all coaches and teachers who helped us in recruiting their students and athletes. We are also grateful to the girls who participated in the project and without whom the study would not have been possible.

**References**


