Cyberbody: a promising assessment tool for body dissatisfaction among eating-disordered patients

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Body image: Multidimensionnel construct

Body image plays a central role in eating disorders

“mental representation of the body’s physical appearance, including perceptual, cognitive, affective and behavioral aspects, as well as influences on the person’s behaviour”.

Perceptual body vs ideal body = Body dissatisfaction

(Bruch, 1962; Pruzinsky & Cash, 2002)
Virtual reality

=> An application that lets users navigate and interact within a 3D, computer-generated (and computer-maintained) environment in real time

Promising tool with considerable potential for research, assessment, and treatment in several mental disorders

(Pratt et al., 1995)
Cyberbody: a promising assessment tool for body dissatisfied patients

Virtual reality

Head-mounted display

CAVE (C-Automated Virtual Environment)

(Images courtesy in Cyberpsychology Lab)
ED and Virtual reality: Cybertherapy

Advantages:

- Increases treatment standardization
- Proposes more attractive interventions to patients
- Provides safe and flexible environment
  - increased control over the pace of exposure
  - more stimuli readily available
- Decreases the need for imaginal exposure
- Increases confidentiality (vs in vivo)

(Bouchard et al., 2007; Gutiérrez-Maldonado, 2009)
ED and Virtual reality: Cybertherapy

Disadvantages:

• Cybersickness
  • nausea, disorientation, general, fatigue, eye strain, and blurred vision
  • 5% in general population

• Acquisition and management of special devices
  => $$$
  => requires extensive training

(Lawson et al., 2002)
ED and Virtual reality: Body image disturbances

Pioneers:
The group of Riva => Italy
The group of Perpiná => Spain

Review:
4 studies with non clinical samples
7 studies with clinical samples (4 case studies)

(Ferrer-García & Gutíerrez-Maldonado, 2012)
**Methods:** Among 7 studies with clinical samples

<table>
<thead>
<tr>
<th>Case studies</th>
<th>Riva et al. (1998) and Riva, Bacchetta, Baruffi, Rinaldi, Molinari, et al. (1999)</th>
<th>1 VEBIM 2</th>
<th>1 female AN</th>
<th>8 VEBIM 2 sessions</th>
<th>BIAQ, BSS, CDRS, FR5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riva, Bacchetta, Baruffi, Rinaldi, Vincelli, and Molinari (2000)</td>
<td>1 ECT</td>
<td>Not available</td>
<td>BI disturbances and lack of control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perpiñá, Baños, et al. (2001)</td>
<td>1 CBT + VR</td>
<td>Not available</td>
<td>BI disturbances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salorio, Gómez, Morales, Torres, Díaz, and Alegria (2004)</td>
<td>1 CBT + Virtual &amp; Body software (Perpiñá et al. 2000)</td>
<td>CBT: 15 group sessions + VR; 10 individual parallel sessions to CBT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controlled studies</td>
<td>Perpiñá et al. (1999)</td>
<td>2 (between subject); SBIT (BI treatment adapted from Cash (1996) and Rosen (1997) + relaxation) + VR (BI treatment adapted Cash (1996) and Rosen (1997) + VR)</td>
<td>18 ED female</td>
<td>SBIT: 3 weekly group sessions of 3 h + 6 weekly parallel sessions of 1 h VR: 3 weekly group sessions of 3 h + 6 weekly parallel sessions of 1 h</td>
<td>BDI, PANAS, EAT, RS, BITE, EDI-2, BES, BSQ, BIAQ, BAT, BIF-Q, ASI, SIBID, BASS, body interfer, fear of putting on weight, self-rating scales to assess VR sessions</td>
</tr>
<tr>
<td>Riva et al. (2002)</td>
<td>2 (between subject); VREDIM (+low-calorie diet and physical training); NC (+low-calorie diet physical training)</td>
<td></td>
<td></td>
<td></td>
<td>DIET, STAI, AI, WELSQ, EUCRA, BSS, BIAQ, FR5, CDRS</td>
</tr>
</tbody>
</table>

**VEBIM:**
- **Zone 1:** training room and balance; and
- **Zone 2:** kitchen and office

**Virtual Reality for Eating Disorders Image Modification**

(Ferrer-García & Gutiérrez-Maldonado, 2012)
ED and Virtual reality: Body image disturbances

**Methods:** Among 7 studies with clinical samples

<table>
<thead>
<tr>
<th>Type</th>
<th>Author(s), year</th>
<th>Condition(s)</th>
<th>N (total)</th>
<th>Sessions</th>
<th>Dependent variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Riva et al. (2003)</td>
<td>4 (between subject): WL, NG, ECT, CBT</td>
<td>36 ED women fulfilling inclusion criteria (9 WL, 9 NG, 9 ECT, 9 CBT)</td>
<td>NG group: 5 sessions of nutritional information + low-calorie diet + physical training ECT group: NG + 15 sessions CBT: NG + 15 sessions</td>
<td>DIET, STAI, BDI-II, RAS, RSEQ, WELSEQ, URICA, BSS, BIAQ, CDRS</td>
</tr>
<tr>
<td></td>
<td>Perpiñá et al. (2004)</td>
<td>2 (between subject): SBIT and CBT + VR</td>
<td>12 ED female (7 AN and 5 BN)</td>
<td>3 weekly group (Cash and Rosen) treatment sessions of 3 h + 6 weekly parallel VR sessions of 1 h</td>
<td>BDI, PANAS, EAT, RS, BITE, EDI-2, BSQ, BIAQ, BAT, BIATQ, ASI, SIBID, BASS, Body interference, fear of putting on weight, self-rating scales to assess VR sessions</td>
</tr>
</tbody>
</table>

(Ferrer-García & Gutiérrez-Maldonado, 2012)
Outcomes:

Cybertherapy is suitable for improving body image both in ED patients and in subclinical samples,
- Cybertherapy > placebo,
- Cybertherapy = CBT or Nutritional Group (NG)
- Cybertherapy + CBT or NG > CBT or NG alone

Limitation: no study has included a continuum of silhouettes in a first-person perspective
Aim of preliminary:
To explore the potential of virtual reality – Cyberbody - in the assessment of body dissatisfaction in female eating-disordered patients.

Sample:
5 ED patients (anorexia nervosa and bulimia nervosa)

Procedure:
Questionnaires (demographic, body dissatisfaction)
Interview (post-immersion, differential diagnostic)
Virtual environment (Cyberbody)

(Monthuy-Blanc et al., work in progress)
An application of VR in ED patients: Cyberbody

First condition (C1) QUESTIONNAIRE

Choose the silhouette is closest to what you look like now

Choose the silhouette that would you most prefer to look like
Cyberbody in third-person perspective “cybercorps-observed perspective”

Second condition (C2) 3rd-PERSON PERSPECTIVE
(bodies are observed)

(Monthuy-Blanc et al., work in progress)
Cyberbody in first-person perspective “cyberbody-field perspective”

Second condition (C2)

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(Monthuy-Blanc et al., work in progress)
Third condition (C3) 1st-PERSON PERSPECTIVE
(Bodies are experienced from a field perspective)
An application of VR in ED patients: Cyberbody

Descriptive data

<table>
<thead>
<tr>
<th>Case</th>
<th>ED</th>
<th>Age</th>
<th>IMC</th>
<th>Ideal weight</th>
<th>Medication</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AN</td>
<td>28</td>
<td>16.8</td>
<td>50</td>
<td>None</td>
<td>Amenorrhea</td>
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<tr>
<td>2</td>
<td>AN</td>
<td>24</td>
<td>18.8</td>
<td>50</td>
<td>Effexor</td>
<td>None</td>
</tr>
<tr>
<td>3</td>
<td>AN</td>
<td>40</td>
<td>24.1</td>
<td>50</td>
<td>Effexor/Seroquel</td>
<td>Alcohol abuse</td>
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<tr>
<td>4</td>
<td>BN</td>
<td>45</td>
<td>37.8</td>
<td>72.2</td>
<td>Effexor/Seroquel</td>
<td>None</td>
</tr>
<tr>
<td>5</td>
<td>AN</td>
<td>18</td>
<td>18.4</td>
<td>45.5</td>
<td>None</td>
<td>Physical hyperactivity</td>
</tr>
<tr>
<td>Mean</td>
<td>--</td>
<td>31</td>
<td>23.2</td>
<td>53.6</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

(Monthuy-Blanc et al., work in progress)
An application of VR in ED patients: Cyberbody

Quantitative outcomes

<table>
<thead>
<tr>
<th>Case</th>
<th>Perceptual body</th>
<th>Ideal body</th>
<th>Body dissatisfaction</th>
<th>Sense of presence (%)*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C1</td>
<td>C2</td>
<td>C3</td>
<td>C1</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>2</td>
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<td>6</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Mean</td>
<td>4.6</td>
<td>4.2</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

*None cybersickness

(Monthuy-Blanc et al., work in progress)
CASE 1

C1 Questionnaires

C2 3rd-person view

C3 1st-person view

(Monthuy-Blanc et al., work in progress)
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Body dissatisfaction scores according to each condition

![Bar graph showing body dissatisfaction scores for different conditions: C1 Questionnaire, C2 3rd person perspective, C3 1st person perspective. The graph compares negative and positive body image scores across conditions 1 to 5.](image)

(Cyberbody: a promising assessment tool for body dissatisfaction among eating-disordered patients. Monthuy-Blanc et al., work in progress)
An application of VR in ED patients: Cyberbody

**Qualitative outcomes**

- stronger emotions (reported and observed)
- more precision
  "all was more detailed...beauty spot, vein, jaw..."
- more discussion post-condition in virtual environnement (cyberbody) compared to questionnaire
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Qualitative outcomes

C1: patients reported sense of detachment and habituation
”I usually fill out this type of questionnaires”

C2: patients reported a sense of curiosity, attirance, repulsion, disgust, sadness or embarrassment particularly concerning silhouettes 7 and 1
”I can imagine becoming silhouette 1 again”

C3: patients reported being either comfortable or confused about the partial perspective of body
”I focus exclusively on my chest”, “It’s under the daily angle”
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Discussion

• Evaluation of body dissatisfaction with Cyberbody allows to adopt either the perception of an observer (C2) or a self-perception point of view (C3) in ecological context.

• Cyberbody-1rt person perspective offers a partial but daily view of own body.

• In certain cases, 1st-person perspective allows to observe reduced body dissatisfaction or even a positive body image score.
An application of VR in ED patients: Cyberbody

Conclusion

=> In CBT *in virtuo* (including cybertherapy), cyberbody-field perspective could represent a evaluation and exposure tool during session of CBT-immersion in ED patients.

=> In the future, differents Cyberbody can be tested: male, athletes, adolescents, etc. to represent all ED individuals.
Any question?

Thank you...
Ameline Dupont, Vanessa Gaudet, Cristelle Perron & Virginie Roy
AND