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Abstract	Severe obesity is a chronic disease associated with medical and psychosocial comorbidity causing disability and poor quality of life that represents a social and economic burden for the National Health Systems worldwide. The Italian Society of Physical and Rehabilitation Medicine (SIMFER), the Italian Society of Obesity (SIO) and the Italian Society of Eating Disorders (SISDCA) have joined in a panel of experts to discuss a consensus document on the requisites of rehabilitation units devoted to patients affected by severe obesity with comorbidities. The main recommendations of the consensus document are the following: (1) the management of severe obesity should be characterized by the integration of nutritional, physical/functional rehabilitation, psycho-educational, and rehabilitative nursing interventions; (2) the intensity of the rehabilitative interventions should depend on the level of severity and comorbidities, frailty of the psychic status, degree of disability and quality of life of the patient; (3) the rehabilitative approach should be multidisciplinary and integrated in relation to the clinical complexity of obesity; (4) the estimated need for multidimensional rehabilitation of severe obesity is 1 bed per every 1,000 patients and of 4 beds in rehabilitative day-care ward every 1,000 patients suffering from severe obesity with comorbidities.

Keywords (separated by '-')	Obesity - Comorbidity - Disability - Treatment - Rehabilitation - Inpatient - Complications - Day-hospital - Consensus statement
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Eat Weight Disord
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ORIGINAL ARTICLE

Rehabilitation in obesity with comorbidities: a consensus document from experts of the Italian Society of Physical and Rehabilitation Medicine (SIMFER), the Italian Society of Obesity (SIO) and the Italian Society of Eating Disorders (SISDCA)

P. Capodaglio · L. M. Donini · M. L. Petroni · A. Brunani · R. Dalle Grave · C. E. Di Flaviano · A. Giorgetti · A. Giustini · L. M. Saraceni

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Abstract Severe obesity is a chronic disease associated with medical and psychosocial comorbidity causing disability and poor quality of life that represents a social and economic burden for the National Health Systems worldwide. The Italian Society of Physical and Rehabilitation Medicine (SIMFER), the Italian Society of Obesity (SIO) and the Italian Society of Eating Disorders (SISDCA) have joined in a panel of experts to discuss a consensus document on the requisites of rehabilitation units devoted to patients affected by severe obesity with comorbidities. The main recommendations of the consensus document are the following: (1) the management of severe obesity should be characterized by the integration of nutritional, physical/functional rehabilitation, psycho-educational, and rehabilitative nursing interventions; (2) the intensity of the rehabilitative interventions should depend on the level of severity and comorbidities, frailty of the psychic status, degree of disability and quality of life of the patient; (3) the rehabilitative approach should be multidisciplinary and integrated in relation to the clinical complexity of obesity; (4) the estimated need for multidimensional rehabilitation of severe obesity is 1 bed per every 1,000 patients and of 4 beds in rehabilitative day-care ward every 1,000 patients suffering from severe obesity with comorbidities.

Keywords Obesity · Comorbidity · Disability · Treatment · Rehabilitation · Inpatient · Complications · Day-hospital · Consensus statement

Obesity is a long-term disease with high comorbidity with considerable impact on disability and quality of life. Obesity with comorbidities leading to disability represents a real social and economic burden for the National Health Systems worldwide. The presence of multiple and associated comorbidities often represents an obstacle for being admitted to clinical settings for the treatment of metabolic diseases. On the other hand, clinical units with optimal standards for the treatment of pathological conditions in

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normal-weight patients are often structurally and technologically inadequate for the care of patients with extreme obesity. The evaluation and treatment of patients with disabling obesity requires clinical facilities where these complex patients can be treated with appropriate therapeutic and rehabilitative protocols carried out by specially trained operators and within an environment, which is ergonomically adequate and safe for both patients and staff alike [1]. Given the figures of obesity worldwide, it appears now important for rehabilitation specialists to make some statements regarding what can be done rehabilitation wise to counteract the disabling consequences of severe obesity with comorbidities in the different settings at different intensities of rehabilitation treatment [2].

In May 2013, delegates of the Italian Society of Physical and Rehabilitation Medicine (SIMFER), the Italian Society of Obesity (SIO) and the Italian Society of Eating Disorders (SISDCA) have joined in a panel of experts to discuss a consensus document on the requisites of rehabilitation units devoted to patients affected by severe obesity with comorbidities.

The consensus

According to the World health Organization (WHO), rehabilitation encompasses all of the interventions aimed at avoiding, overcoming or minimizing the impact of conditions or trauma on individual functional capacities and on social, cultural and professional participation. This definition includes some fundamental issues:

- baseline condition or associated conditions
- functional consequences or disability of various degree
- integration of different (medical, social) rehabilitative interventions
- potential individual functional recovery.

According to the Italian Standard for the Care of Obesity (2012–2013) [3], the mission and the operational modalities of rehabilitation medicine are in line with the natural history of obesity which is characterized by comorbidities, chronicity and disability with severe consequences on quality of life (Level: I; Strength of Recommendation: A).

Therefore, the rehabilitation pathway of the obese patient should be characterized by the integration of nutritional, physical/functional rehabilitation (physiotherapy, therapeutic exercise, physical reconditioning, adapted physical activity), psycho-educational (therapeutic education and short focused psychotherapeutic interventions), rehabilitative nursing interventions (Level: IV; Strength of Recommendation: A). The intensity of the rehabilitative intervention should depend on the level of severity and comorbidities, frailty of the psychic status, degree of disability and quality of life of the patient (Level: VI; Strength of Recommendation: A).

The rationale and the criteria of the metabolic–nutritional–psychological rehabilitation (MNPR) have been addressed in a consensus document endorsed by Italian Society of Obesity (SIO) and Italian Society of Eating Disorders (SISDCA) and published in 2010 [4]. In this document, it is stated that the rehabilitative approach should be multidisciplinary and integrated in relation to the clinical complexity of obesity. The multidisciplinary team should be directed and coordinated by an internist (e.g., nutritionist, endocrinologist, gastroenterologist) or a physiatrist with expertise in the rehabilitative treatment of patients with obesity. It is therefore mandatory to assess quality of life, disability, motor function (muscle strength, balance, tolerance to effort) and musculoskeletal problems (articular pain, limitations of the range of motion) [3].

Multidimensional rehabilitation can also be applied to complicated bariatric surgery patients in both the pre-op and post-op period.

Intensity of interventions

Intensive rehabilitation interventions are directed to the recovery of major disabilities susceptible of modifications which require highly specialized medical rehabilitative and therapeutic care in terms of complexity and/or duration of intervention. The latter consists of rehabilitative interventions provided by the health care professionals and the rehabilitation team (physiotherapist, occupational therapist, dietician, psychologist, nurse), particularly focusing on those tasks finalized to the improvement of activities of daily life. The rehabilitation project and its specific programs define the schedule of the rehabilitation interventions and the time required for their completion and achievement of the goals. The intensive rehabilitation interventions are focused on the treatment of obesity and related conditions, which requires a multidisciplinary devoted rehabilitative setting, structurally adequate to the needs of patients with excess of body mass with availability of bariatric lifting and transferring aids.

The activities of extensive rehabilitation are characterized by a moderate need for clinical therapeutic care and by high demands of supportive interventions for the patients undergoing treatment. The clinical therapeutic burden of care, however, specifically requires multidisciplinary rehabilitative competences. The extensive rehabilitation interventions address important disabilities with potentially permanent and often multiple sequelae requiring long-term care according to a rehabilitation project.

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Individual rehabilitative project (*PRI*)

The Italian *Piano d'Indirizzo per la Riabilitazione* [5] and the Italian Ministry of Health [6] state that the PRI defines prognosis, expectations and priorities of the patient and relatives/care givers. The project is shared with the patient, family and care givers. It defines the characteristics of appropriateness and congruity of the different interventions as well as the completion of the health care phase in relation to the goals achieved. In the PRI, the specific intervention areas, the short-term goals, the modalities of application of the interventions, the professionals involved and the assessment of the results are exhaustively defined.

Such concepts have been acknowledged both by the 2010 SIO Consensus document on the standards of care in obesity [4] and in a 2011 document of the Italian Ministry of Health dedicated to obesity [7], which states that an integrated individual rehabilitation project encompasses different areas of intervention and short- and long-term goals:

(a) Nutritional intervention finalized to: restore correct eating habits (quality, quantity) in the long term; achieve a weight loss of at least 10 % of the initial body weight with significant reduction of the fat mass and maintenance of the lean mass.
(b) Motor/functional rehabilitation program (functional recovery, physical reconditioning, motor rehabilitation) finalized to: improve hypotonic and hypotrophic muscles due to disuse; restore range of motion; improve cardio-circulatory and respiratory capacities.
(c) Therapeutic education and psychotherapeutic interventions targeted to: acknowledge the real needs of the patients; correct the false beliefs on nutrition and physical activity; train self-control and management in eating, physical activity, stress and anxiety (self-monitoring of eating, physical activity and weight, stimulus control, problem solving, cognitive restructuration); improve illness behavior.
(d) Rehabilitative nursing, interventions performed by nurses and targeted to: improve patients' responses to chronic conditions, disability and pathological life styles; increase the social and environmental supports and compensations; protect and stimulate the functional and relational capacities in order to optimize participation to rehabilitation activities and health care programs

In the rehabilitation programs, the followings requirements are specified for each area of intervention (nutritional, physiotherapy, psychology, nursing):

- Criteria for admission to a specific rehabilitation pathway, facility or professional, in line with the professional competences and the accreditation criteria.
- Short- and medium-term goals.
- Specific rehabilitative interventions and their duration.
- Expected outcomes, appropriate in relation to the interventions performed.
- Assessment and completion of the activities.

The environment where the inpatient rehabilitation programs are held should be structurally and ergonomically adequate and safe for both patients and staff alike, with the adequate presence of bariatric aids and lifting/transferring devices compared to the number of obese inpatients [8].

In the aforementioned documents [3–7] the appropriateness criteria for both the rehabilitation processes and the facility have been defined.

The estimated need for multidimensional rehabilitation of obesity is 1 bed per every 1,000 patients and of 4 beds in rehabilitative day-care ward every 1,000 patients suffering from severe obesity with comorbidities (figures estimated in about 0.8 % of general population with wide differences among regions). At least two-thirds of the day-care ward beds should be based at peripheral centers within each region in order to ensure uniform coverage. The inpatient units should be composed of at least 20 beds, rehabilitative day-care wards of at least 5 beds. Those regions with <20,000 patients with severe obesity with comorbidities in their territory could identify overregional reference structures. Considering the goal of devoting to obesity rehabilitation the 0.05 % of overall national rehabilitation beds there could therefore be hypothesized about 10–15 inpatient rehabilitation facilities and about 35–45 day-care rehabilitation facilities nationwide [9, 10].

Conclusions

Rehabilitation of complex obese patients require a here-and-now multidimensional, comprehensive approach, where the intensity of rehabilitative treatments depends on the disability level and severity of comorbidities and consists of the simultaneous provision of physiotherapy, diet and nutritional support, psychological counselling, adapted physical activity, specific nursing skills. A multidimensional approach able to provide frontline assessment and preventive strategies, risk stratification, and disease management is needed and for that purpose, a team approach and the integration of several medical specialties, including clinical nutrition, endocrinology, psychiatry, and rehabilitation medicine encompassing different health professions, including dietitians, psychologists, physiotherapists and nurses is required. This is in line with the indications of the

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Italian Society of Obesity [3], the 2010 consensus of the Italian Society of Obesity and the Italian Society of Eating Disorders [4] and the Italian Ministry of Health, who has acknowledged [5, 6] the need for a rehabilitation pathway for severely obese patients with comorbidities. Those documents highlight the need for multiple rehabilitative settings according to the severity of disability, which calls for the need for multidimensional evaluation encompassing quality of life, disability, functioning and participation.

Rehabilitation is a setting in which patient-centered care can be vigorously implemented, empowering patients who no longer delegate physicians, but become protagonist in their health management. Clinician–patient communication should be patient-centered to include the patient perspective and the psychosocial context along with shared understanding and responsibility. Health literacy improvement is indeed another goal of rehabilitation programs: low health literacy, quite habitual in the obese, can result in decreased adherence to medical recommendations, failure to engage in healthy behaviors, and inferior outcomes.

Conflict of interest The authors declare that they have no conflict of interest.

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