



Original Research Article (Experimental)

# 'Obesity and arthritis' as the morbid duo: Designing and experimenting a novel strategy for weight reduction at a secondary care ayurveda –arthritis center



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## ABSTRACT

Obesity has been a critical confounding factor in arthritis. Its impacts are seemingly more apparent in conditions like knee osteoarthritis but it affects the net outcome in almost every type of arthritis. Reduction of weight is the obvious first advice by a treating physician in such cases. In the absence of a clear roadmap however to reach the goal, It remains an unmet advise for most arthritis patients. Obesity combined with arthritis, becomes a morbid combination where addition of weight adds to intensity of arthritis and arthritis induced limitation of movements adds to the weight. Weight reduction is much tougher in arthritis due to the physical limitations. Noticing this gap of knowledge between desired and achieved, Ayurveda –arthritis treatment and advanced research center at Lucknow has designed a strategic plan as a real help to such people and executed it through the activities focusing upon educating the obese arthritis patients for causes and concerns of obesity in general and individualized management plan through an interactive workshop. A workshop of its own kind was conducted on 24 April 2022. 28 obese arthritics as participants had offered to understand the real need and feasibility of doing these strategically focused activities aiming at weight reduction. This has come up as a new opportunity of help to the obese arthritis patients by empowering them with practical knowledge and tools to reduce weight suiting to their individual capacities and needs. The feedback of the participants provided at the end of the workshop was highly encouraging and has shown that strategically focused activities to bridge the gaps in clinical practice are highly desired and useful.

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## 1. Introduction

Obesity is among most significant warning features related to the cause, intensity and poor prognosis in knee osteoarthritis (KOA) [1]. Clear association of increasing BMI with that of odds ratio of developing KOA is found in numerous studies [2]. Recent studies also suggest that besides the mechanical load and resulting wear and tear in load bearing joints [3], adipose tissue also plays a pivotal role in induction of KOA through inflammation [4]. Obesity also plays significantly in the initiation, intensity and prognosis of inflammatory arthritis including Rheumatoid arthritis (RA) [5]. RA patients who are obese used to have higher symptom intensity and poorer prognosis comparing to the lean RA [6].

Although much work has been done to understand the pathophysiology and bio-mechanics of obesity in relation to arthritis of inflammatory or degenerative origin [7], much is still desired to be understood and done to handle the obesity effectively in arthritis sufferers. There are evidences of sustained improvements in disease activity in psoriatic arthritis and OA following weight loss programs [8], little is done to frame a structured approach for effective weight reduction in general arthritic population. Obesity is found associated with poor remission rate in patients with longstanding RA treated with Disease Modifying Anti Rheumatic Drugs (DMARDs) and biologics. Taking the cognizance of obesity as an important co-factor to determine ultimate outcome in almost all kind of arthritis and seeing the difficulty in adopting a general blanket rule for all to achieve weight reduction, a personalized treatment plan seems utmost required in all arthritis patients having co-morbid obesity [9].

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Weight reduction is often the first recommendation given to the patient by the treating physician dealing with an obese patient having arthritis. Unfortunately, the patients who are actual sufferers of arthritis and obesity both have little or no awareness of handling their surplus weight effectively. Even though weight loss and its benefits are appreciated by every obese arthritic patient, little is known to them about precise ways to reduce their weight effectively and to maintain the weight once the surplus weight is lost.

## 2. Studies on weight loss programs in arthritis and associated benefits

Increased body weight is a morbid yet modifiable risk factor associated with higher intensity and poorer prognosis in arthritis. Weight loss reduces pro-inflammatory cytokines and adipokines which are supposed to have a role in cartilage degradation.

Structured weight reduction plans in arthritis have been able to show the clinical benefits associated with weight loss. Such benefits have often been found closely related with the extent of weight loss. Strategies adopted for weight loss in arthritis population largely consist of calorie reduction, meal replacements and behavioral strategy. Such composite strategies are shown to be able to induce 5–11% weight loss in study participants in 6–18 month time. Studies like Arthritis, Diet, and Activity Promotion Trial (ADAPT) achieved 5% weight loss over 18 months using a reduced-calorie diet with behavioral strategy [10]. Similarly Physical Activity, Inflammation, and Body Composition Trial (PACT) pilot study could achieve 9% weight loss over 6 months in obese older adults with knee OA by combining a partial meal-replacement plan with accepted behavioral strategies [11]. Consistent three fold improvements in WOMAC function was observed using a similar cohort and an intensive low-energy diet leading to 11% weight loss [12]. A meta-analysis concluded that weight loss in knee OA patients significantly reduces disability and found that a critical amount of weight loss (at least 10%) is needed to give a moderate-to-large clinical effect [13]. It is largely accepted that weight loss should be the first-choice therapy for obese adults in all kind of arthritis including knee OA.

## 3. Challenges of weight loss programs in arthritis

Inducing the weight loss and maintaining the reduced weight in long run has always been challenging. It is even more challenging for arthritis patients who have limited physical capacities to run the energy expenditure based weight loss program. Studies suggest that maintaining 5–10% weight loss for  $\geq 1$  year can ameliorate many comorbidities, hence this should be the first goal of any weight reduction program [14]. A meta-analysis comprising of 29 long-term weight loss studies suggests that, if unmonitored, more than half of the lost weight induced through any weight loss program is expected to be regained within two years. By five years more than 80% of lost weight could be regained [15]. This shows that maintaining the lost weight is even more challenging than weight reduction alone. Such weight maintenance requires a long-term support and motivation to reinforce diet, physical activity and behavioral changes.

Lack of motivation, absence of peer groups with similar goals, unawareness about the logic of weight reduction and its possible benefits, unawareness about the key components of weight loss program, unawareness of the need of individualizing any such program, unawareness about some practical dietary and behavioral modifications are other barriers and challenges which eventually leads to the failure of any such weight reduction program in the long run [16].

## 4. Overcoming the challenges: designing a structured weight reduction program for arthritis patients

Taking the cognizance of importance of weight reduction among obese arthritic people and considering their special status for being unable to reduce the weight by increasing the energy expenditure, Ayurveda – Arthritis Treatment and Advanced Research Center (A-ATARC) at Lucknow which is a recent functionary providing secondary ayurveda care in arthritis [17], designed a structured weight reduction program for obese arthritis patients. Executed through a workshop, this program aimed at providing the participants scientifically valid, logical and doable tips to reduce the weight and to maintain the reduced weight by setting a long term goal. A-ATARC has previously shown its intuitiveness and eagerness to intervene in often ignored problems specific to arthritis people in general irrespective of kind of diseases or treatment options they choose. Its proposition of ‘*aamvatostsava*’ as a mean to improve the self-respect among arthritis patients under the phrase of ‘celebrating the life despite the limitations imposed by arthritis’ was thought to be a game changer in contemporary clinical practice of rheumatology [18]. Initiation of grand rounds in ayurvedic rheumatology ([19] R<sup>1</sup>), collective prayers inclusive of health care providers and health care seekers in arthritis setting ([20] R<sup>2</sup>) and initiation of community based self-help group under the auspice of ‘*Gathiya Mitra Mandal* (consortium of arthritis friends) are other novel activities taken up by the center.

### 4.1. Designing the structure and components of the program and its execution

#### 4.1.1. Identification of need and resources to meet the need in real arthritis clinical practice

Approximately 15–20% patients of all visiting A-ATARC are found in range from overweight to morbidly obese. Maximum individual adult weight reported in this clinic is 125 kg. Surprisingly, when such obese patients were recommended for weight reduction during the first consultation, almost everyone was curious to get a medication which can help them reduce their weight and also almost everyone was self-sure of not consuming any extra calorie which might have been adding to their weight. This observation has given us two important areas to work for making an effective weight reduction strategy. One was to bust the myth of possibility of weight reduction with the help of medication alone without active involvement of the individual and the other was understanding the actual daily calorie consumption of such patients so that actual calorie slips can be identified and rectified. In order to understand the essential components of the weight reduction strategy and its execution plan, few brain storming sessions have been conducted at center before the actual execution of the program was done in the form of a workshop.

Following components have been identified during the brainstorming as crucial elements of weight reduction program meant for arthritis patients (Table 1). -

#### 4.1.2. Execution of the program: organization of the focused workshop

In order to deliver what was conceived as the essential component of weight reduction program for arthritis patients, a workshop was organized aiming at obese arthritis people not having any specific medical reason underlying their obesity. The workshop was limited to uncomplicated and self-motivated obese arthritis people willing to reduce their weight and have shown their willingness by enrolling themselves as the participants for the weight reduction workshop. The workshop was open to all above 18 years and had no restriction related to gender, religion, caste and

**Table 1**  
Essential components of a weight reduction program for arthritis patients and method of their effective delivery.

No	Item domain	Method of effective delivery
1	Appreciation of knowing that one is overweight	Delivery of knowledge about ideal weight, overweight and obese in reference to height and gender
2	Appreciation of knowledge that extra weight contributes to the joint related problems	Delivery of knowledge connecting the obesity with joint disease in simple language
3	Appreciation of knowledge that weight reduction may cut the intensity of their joint related problems	Delivery of knowledge based upon clinical observations made earlier
4	Appreciation of knowledge about the surplus weight in each individual case	Calculating the surplus weight in each individual case on the basis of BMI calculation
5	Appreciation of knowledge about methods of effective weight reduction though dietary intake related qualitative and quantitative changes in daily routine	Categorical check of dietary intake in each individual case and finding the items where maximum impact can be created
6	Appreciation of knowledge about alternative methods of cooking in order to reduce calorie intake without compromising the quality and taste	Demonstration of food items cooked through alternative methods and allowing the participants to eat in order to appreciate its taste.
7	Appreciation of knowledge about ancillary physical activities and ambience which may help reducing the weight in long run	Delivery of knowledge about how ambient temperature can help weight reduction and how some small physical activities can induce weight reduction
8	Making an individualized weight reduction and reduced weight maintenance plan	Appreciating the knowledge about surplus weight in each individual case and making a realistic time goal for achieving the optimal weight reduction
9	Framing the individualized methods to obtain the goal	Actual listing of doable and not doable in each individual case
10	Appreciating the achievers and motivating the non-achievers during follow-ups	A close follow up to see how each individual is doing and to see what help they need to achieve the goal

socio-economic status. The conditions for exclusion were severe debility, deformity, systemic complications, cognitive impairments and lack of family support. The workshop participants were advised to join the workshop along with their spouses in order to optimize the benefits obtainable through mutual support and cooperation in kitchen based activities.

#### 4.1.3. Workshop setting

Workshop was done at A-ATARC, State Ayurvedic College and Hospital, Lucknow during routine hospital working day and time.

#### 4.1.4. Designing the components of the workshop

The components of the workshop and the methods of its delivery were as per the outcome of brain storming sessions conducted before hand (Table 1). The components of the workshop and their delivering strategies were fine-tuned and refined by the center in-charge (SR). While designing the program, ayurvedic principles for weight gain (*santarpan*) and loss (*apatarpan*) along with contemporary science and research related to weight loss program were duly utilized.

#### 4.1.5. Medium and method of delivery

Workshop was planned to be delivered in simple Hindi language, being the language of the common people in North India. Since the workshop was aiming at common people not having any technical background in Ayurveda or medical science, the technical terms compulsive to be used, were translated into easy to understand colloquial terms. In order to accommodate the people from all literacy level (illiterate to literate) and background, the presentation of the workshop was made lucid with enough breaks, intervals and interactive opportunities to reach out to the participants. A multimedia presentation including power point slides embedded with illustrative videos, and interactive activities was the chosen method of knowledge delivery.

### 5. Basic components of the workshop

The workshop components were derived from the outcome of brain storming sessions meant for deriving the strategy adopted for weight reduction. This covered three domain areas namely 1. Delivery of knowledge about importance of weight loss and methods

to achieve it, 2. Individualizing the knowledge through multiple interactive sessions and 3. Practical demonstrations of various activities related to weight loss. Following is the description of each of these components-

#### 5.1. Delivery of knowledge about importance of weight loss and methods to achieve it

In this section, the participants were planned to be made aware about the hazards of increasing weight in general and in arthritis in particular. They have been made aware about the general causes of weight gain and were explicitly explained about positive energy imbalance responsible for weight gain in majority. They have further been explained about common methods of weight reduction focusing upon reduction of energy intake and increasing the energy expenditure. The focus was given to reduce energy intake without compromising the optimal nutrition through simple modifications in the cooking methods and choice of food. Dietary concept of Ayurveda pertaining to weight reduction was duly utilized in this session. Increasing the energy expenditure guidance was essentially based upon simple techniques that do not require joint specific or muscular movements hence making them suitable for arthritis population. Breathing techniques from yoga having a potential to increase metabolism and hence inducing weight loss were adequately detailed in this session.

#### 5.2. Individualizing the knowledge through multiple interactive sessions

There were 8 interactive sessions interspersed throughout the first session focusing upon the knowledge delivery. The purpose of this session was to individualize the weight loss requirement as per the need of individual participant and choosing the most appropriate ways to reach to their weight reduction goals. Interactive sessions included the calculation of ideal weight as per the height of the person, surplus weight, average energy intake, average energy expenditure, average energy requirement as per age, gender and activity level, suggestions for dietary replacements from high glycemic foods to low glycemic foods, suggestions for modifying the cooking methods and choosing an individualized weight reduction plan suitable to individual needs.

### 5.3. Practical demonstrations of various activities related to weight loss

This session was proposed to be interspersed with the main session and it focused upon the practical demonstration of modified cooking methods like zero oil cooking, roasting, steaming, boiling, sprouting etc. Workshop participants were subsequently served with food prepared through these methods in order to perceive their palatability and taste. This session was highly admired by most participants and was highly useful for the spouses of the participants as it was showing the practical methods of modified cooking with less energy intake but essentially without compromising the nutritive value of the food. Practical demonstration of yoga techniques like *kapala bhati* and *bhastrika* was also given as an addition to weight reduction to overweight arthritis patients who are not able to do strenuous physical exercises due to their limited joint mobility [21].

Subsequent to these sessions, before summing up the participants were allowed to share their views on the workshop and to ask for their doubts if they had any. This session was highly productive as many participants could share their doubts and could have been adequately responded by the experts available in the workshop.

## 6. Conduction of the first workshop: the process and the lessons learnt

Once the strategy on need and method of weight reduction in obese arthritis patients was framed, a workshop with an intention to deliver and demonstrate the effective weight reduction techniques to obese arthritis patients was planned. The information about the upcoming workshop was circulated well in advance in the routine outpatient clinic of A-ATARC. The information was given through posting a notice at the notice board asking the overweight people to register themselves for the workshop if they wish so. Additionally, all patients visiting the OPD, having been recommended by the physician to reduce their weight were specifically told about the upcoming workshop and were encouraged to register for the upcoming workshop. The register meant for the registry of candidates willing to reduce weight contained the basic information like name, age, gender, weight, height and contact number. With the help of information available at the registry, all who have registered themselves were telephonically called and reminded by the A-ATARC staff a day prior to the date of conduction of workshop. Out of 45 potential candidates registered in the registry, 28 have given their confirmation to participate. Out of 28 who confirmed to participate, 25 could actually participate in the workshop.

The first workshop for weight reduction among obese arthritis patients was conducted on 24.3.2022 (Thursday) at A-ATARC, State Ayurvedic College, Lucknow. It started with a prayer at 11.00 in the morning and was concluded at 2.00 pm (180 min approximately). Twenty five obese arthritis participants including 13 female and 12 male have participated in the workshop. Twenty two of them were also joined by their spouses. Average age of workshop participants was ~46.5 years (23 years minimum, 70 years maximum). Average weight of the participants was reported to be ~72.5Kg (Minimum 59 Kg; Maximum 108 Kg).

The workshop was conducted on a structured format. It began from introduction of the facilitator and team of A-ATARC followed by the introduction of the subject. The information was presented with the help of power point presentation. The facilitator tried to connect with each one of the participant to check if the message is being adequately delivered to the audience. The workshop was divided into three segments namely knowledge sharing, interaction and practical demonstration. It was finally concluded by a

feedback and question answer session. Approximate time shared by individual sessions was about 100 min in knowledge sharing, 30 min in interaction, 30 min in practical demonstration and 20 min for answering the questions of the participants. During the workshop, each one of the participants was provided an individualized awareness about the need of reducing weight, amount of surplus weight, main cause of putting on weight in an individual, common methods of increasing energy expenditure and reducing energy intake suiting to individual needs and making an individualized action plan and objectives to achieve in a specified period. High stress was given on maintaining the reduced weight and making a long term goal spanning between many months to make the weight reduction a reality.

Ayurvedic concepts of weight reduction were duly utilized in workshop [22]. The concept of *guru* and *laghu* food, use of *kapha* reducing food, avoiding daytime sleep (*divaswapna*), promoting proper night sleep and avoiding *ratri prajagaran* and use of food like roasted *yava* were duly shared with the workshop participants [23]. The feedback and resolving the queries session at the end of the workshop was highly productive. Almost every participant of the workshop came up with some of their unique concerns which were subsequently addressed by the workshop facilitators. Most participants have admired the novelty of the workshop and the concern of A-ATARC towards weight reduction of the arthritis sufferers. This was largely agreed that more of such workshops should regularly be conducted to accommodate new participants as well as those who wish to repeat the sessions. To monitor the progress of the participants a WhatsApp group was proposed to be created. A three monthly follow up of all participants was recommended to monitor the progress as well as to provide extra support if needed by any individual. A preliminary follow up has shown modest reduction of 3–5 kg in most participants in 3 month duration.

## 7. Conclusion

Weight reduction and its maintenance had been a difficult task to most obese people. This is tougher for the people suffering with arthritis for its restrictive imposition upon activities related to energy expenditure. Weight gain has largely been an outcome of positive energy balance and hence its reversal is essential to achieve any measurable weight loss. People who wish to achieve weight loss often do it erratically due to their unawareness of the common principles of weight loss and methods to prevent its regain. It is for this reason, such attempts often fail to produce any measurable effect. A-ATARC, a novel Ayurveda arthritis treatment and research center, could perceive the urgency of help needed by the obese arthritis patients struggling for weight reduction. Framing the strategy for effective weight reduction and visualizing the methods of demonstration and delivery suiting to the individual needs which was done through number of brain storming sessions among stake holders was first step to materialize this unmet need. Next was to execute it effectively to suit individual needs and resources. The strategy adopted was effectively executed through a focused workshop keeping every component of strategy in mind and having utilized the modern and Ayurveda concepts of weight reduction through interactive sessions and practical demonstrations. Monitoring the workshop participants through follow-ups in the OPD was able to demonstrate the utility of such programs in effective weight reduction in many and at the same time was also able to demonstrate more intensified motivation and clarity in demonstration of adaptable activities and their benefits. A continuous enquiry by the obese arthritic people regarding the future workshops and an intense willingness to participate again shown by those who have participated in first workshop was a clear

indicator of need and utility of such programs in the effective management of arthritis. Such programs based upon strategically designed protocol catering to the need and matching the resources seem to be the key component of any life style modification strategy recommended for the people suffering with arthritis. Moreover, such programs are highly useful to every obese arthritis patient irrespective of their primary choice of the system of health care.

### CRedit author statement

**Sanjeev Rastogi:** Conceptualization, Methodology, Original draft preparation, **Preeti Pandey:** Conceptualization, Execution, review of the manuscript, **Sumit Kumar:** Execution, review of the manuscript, **Ankita Verma:** Supervision, Execution, Review of the manuscript, **Chinmayi R:** Validation, Reviewing and Editing.

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### Declaration of competing interest

Authors declare no conflict of interest.

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