



Original Review Article

Fad diets on metabolic syndrome among sedentary women — A systemic review

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ABSTRACT

Introduction: Current trends show that many people, mainly young generations, are inclined to crash dieting by adopting various fad diets visible in popular search engines. Fad diets may be helpful in very few cases if customized for a particular patient or a person. As per current topics, metabolic syndrome is a severe issue that may be a single disorder or a group of diseases that often affect many people.

Objective: To systematically review and analyze current literature trends on various fad diets and their links with adult populations' metabolic syndrome.

Materials and Methods: A systemic review was conducted by searching and selecting open-sourced articles in Medline, EMBASE, SCI, Cochrane databases. Free text search and selective vocabulary terms relating to fad diets, crash dieting, weight-loss diet, metabolic syndrome diets, health, etc., were used for an online search. After extensive literature search and filtration of studies, finally, 13 studies were selected for the systemic review with the help of NVIVO 10 software.

Results: 'Word frequency' under the query section was used to analyze word frequency as per criteria. The searching text option was considered at the 40% level by choosing the 20 most frequent display words with five minimum lengths. The study showed the most focussing word 'weight' with 0.55% and 716 counts followed by 'health' with 0.41% having 620 counts in the word frequency list among all the 20 most used keywords in all the papers. Similarly, the word 'diet' was used in 561 counts with 0.43%. The study also demonstrated word cloud figure and cluster analysis by word similarity. Hence there was no need for other coding and meta-analysis as all papers were imported from Mendeley for review

Conclusion: More research is needed on the fad diet and metabolic syndrome; however, authors are concerned about public health safety.

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1. Introduction

Fad diets or crash diets are becoming popular day by day, expecting quick weight loss and subsequent health benefits from other lifestyle disorders. Obesity is one of the significant burning issues that has increased three times in the last three decades (1.9 billion reported in 2016 by WHO). Simultaneously more than 35 million children have been reported as obese as per the record available from WHO^{1,2} The extreme diets, also called fad diets, have been practiced by many populations, mainly in metro cities and urban areas. The quick loss of weight by the improper and

unscientific ways without calculative diet plans are often a cause of serious health hazard in various countries including India. The fad diets may reduce weight within a short time, but it comes back its position if discontinued. The fad diets somehow minimize weight, but the respective person often faces some health complications.³ Commonly, they are weakness, hypoglycemia, hypo tension, hypovitaminosis, and other nutrients deficiencies. Sometimes, a concerned obese person may face many troubles to get back the lost health in total.^{4,5} Young girls and middle-aged women are another population group highly affected by obesity and crash dieting. The polycystic ovarian syndrome is one of the pervasive endocrine disorders among obese women, mainly

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resing in cities. Many studies showed that dyslipidemia is significantly correlated with PCOS women who always showed higher triglycerides and lower high-density lipoprotein cholesterol.⁶ So metabolic disorders happen due to their improper lifestyles that can be compensated with proper diet and daily exercise for some time. In western countries like America and Europe, almost 28% of obese women are positively correlated with PCOD in addition to type II diabetes. India is another prominent example undoubtedly.^{7–12} In general, Metabolic syndrome (MetS) is a group of metabolic disorders that include central obesity, hypertension, diabetes, dyslipidemia, atherosclerotic or non-atherosclerotic cardiovascular diseases.^{9–13}

2. Material And Methods

The systemic review was conducted searching for open-sourced and open access articles in Medline, EMBASE, Sciences Citation Index, Cochrane database. Free text search and controlled vocabulary terms relating to fad diets, crash dieting diet diets on metabolic syndrome, exercise using OR, AND, NOT Boolean operators were applied as search methods.^{9–18} The 'similar article title and the 'related articles' were used to search from Google Scholar to locate more important additional articles. The citations' tracking was done from Web of Science and Scopus' reference lists as per open access possibilities.

Inclusion criteria: All peer-reviewed papers published since 2020 in English were qualitatively identified and assessed in the perspective of various fad diets application on metabolic syndrome, highlighting mainly obesity, PCOS, and Cardiovascular disorders (mixed methods studies). The trending crash diet or so-called fad diets considered only.^{8–18}

Exclusion criteria: The articles were excluded based on keyword search and precisely researched obesity, PCOD, and cardiovascular diseases. Further, adult populations had been considered only but not children. The diet patterns which are scientifically proven already not included as these are not our discussion.

2.1. Screening of data

A total of 4324 articles were searched in the various electronic database, including scholarly articles in Google as search engines. Total 3481 articles came into the shortlist after the removal of 843 duplicate articles at the primary level. A whole 3449 numbers of articles were discharged and finally selected 32 with full papers based on inclusion and exclusion criteria by following the relevant keywords. At last, 13 complete studies were finally selected in this review study divided into 3 tables by reviewing the following health issues such as i) Obesity, ii) PCOS & iii) Cardiovascular disorders.^{18,19}

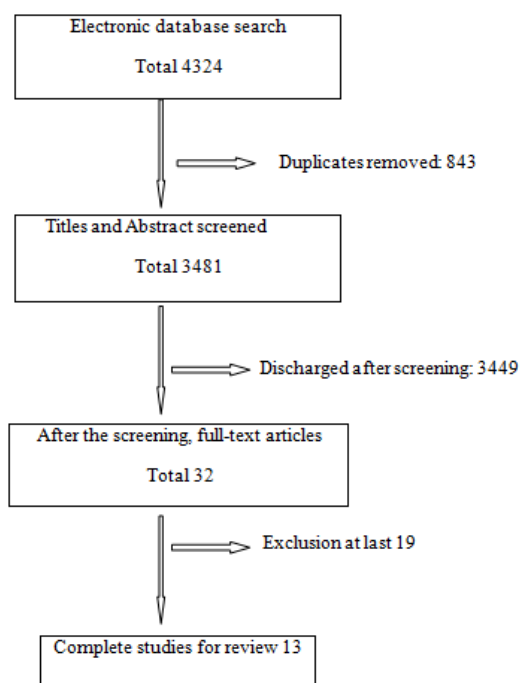


Fig. 1: Literature search and filtration for review study^{14–16}

2.2. Extraction of data

NVivo 10 as software has been used for data screening and data analysis. All 32 articles were uploaded as pdf versions in Mendeley, followed by exporting into the computer's 'my collection' (RIS formatted file). The 'my collection' file was uploaded to analyze the studies.^{15,18,20}

Word frequency under the query section was used to analyze word frequency as per frequency criteria by searching text option at the 40% level of search by choosing 20 most frequent display words with 5 minimum length. A total summary of all 20 words has been noted in a table with their percentage position irrespective of uses in the papers as keywords (ref: table.2). The words cloud image has been considered and showed here for better understanding (fig-2). A cluster analysis of all 13 papers has also been done, and the figures have been guiding here in this article (fig.3).

Fad diet, Diet patterns, Health; Associations, Weight management; Energy intake; High-fat diet; Leptin; Metabolic syndrome; Diet; Exercise; Metabolic syndrome; Cancer; Coronary artery disease; Diabetes; Hypertension; Metabolic syndrome; Crash diet.

3. Results

The systemic review study sorted and finally selected 13 research articles that were 12 in 'internals' 1 in 'externals' under the part of 'sources.' In addition to that, memos were attached in the same position. Still, the memos were not included for analysis. Hence, the

articles uploaded in Internal Sources have illustrated the total picture of the reference chart mentioning all authors' categories irrespective of the articles' publications details. In this review study, the final inclusions were the year of publication, name of titles of the individual articles, and their volume, issue, pages, section, and a secondary title, if any. (ref: table.1). The analysis has been done in three parts which concerned all types of fad diet and various diseases. Secondly, the importance of diet and exercises focusing on crash dieting effects. Lastly also the papers related to cardiovascular diseases and types of diet applied.

The study analyzed the primary 20 keywords that were used in the selected papers in the reference list. Out of which, weight as a word got maximum weight age that showed 0.55% with 716 counts followed by 0.41% with 620 counts in the word frequency list among all the 20 most used keywords in all the papers. Similarly, the word 'diet' was used in 561 counts with 0.43%. I have only demonstrated word frequency at 20 words search level and cluster analysis by word similarity in the paper. Hence, there was no need for other coding and meta-analysis (table.2. & fig.4).

I showed the complete list of all articles finally selected. All the papers discussed the various trending fad diets or crash dieting often used worldwide based on their literature survey. From 2005 till 2020, as current years sorted and selected articles were considered for this systemic review. In case no data then noted as unassigned.

The above table demonstrated and reviewed all the related keywords frequently observed in the 13 studies. The words were focused as per study perspectives with the percentage, count, and length. Therefore, fad diets highly matter with weight, obesity, cardiovascular diseases, and overall metabolic syndromes as per the author's work since 2005. At the same time, figure 2 and figure 3 demonstrated word cloud and word frequency flow consecutively, focusing on the most used keywords for current and future research

The above graph was prepared based on authors' perceptions and subsequently their year-wise work. Hence various research cum reviews were published in the perspective of fad diets' proper application.

4. Discussion

As per analyzing 13 research articles, 20 keywords were mainly highlighted based on a maximum of 14 lengths and a minimum of 5 lengths. The 'weight' is visible as a mostly focussed word due to the full implementation of fad diet on weight management by the ordinary people considering an instant response. As per word frequency query results, weight was mainly visible, followed by health and diet. This denotes that studies in the subject of weight management and fad diet, the two keywords primarily used in search engines and other databases.

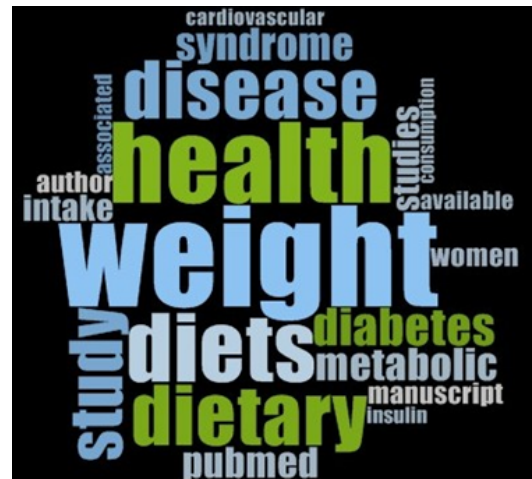


Fig. 2: Word cloud of internal sources

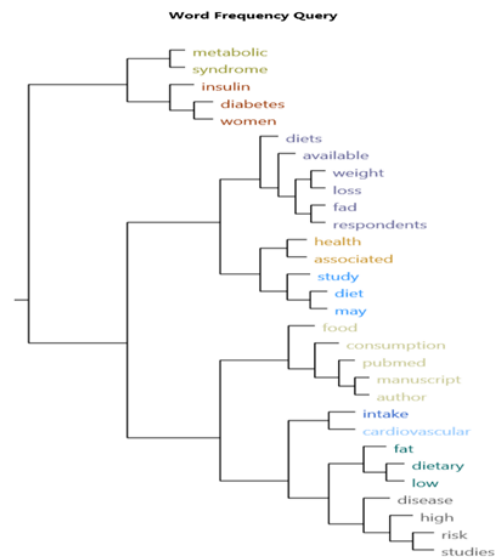


Fig. 3: Flow chart of word frequency query

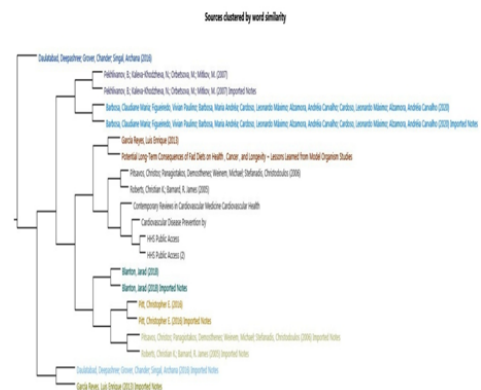


Fig. 4: Sources clustered by word similarity considering ten clusters as per the study perspective.

Table 1: Complete reference list as per finally selected articles^{13–24}

Year	Author	Title	Volume	Issue	Pages	Secondary Title	Section
2005	Roberts, Christian K.; Barnard, R. James	Effects of exercise and diet on chronic disease	98	1	3 - 30	Journal of Applied Physiology	3
2006	Ignatius G.E. Zarraga, MD; Ernst R. Schwarz.	Impact of Dietary Patterns and Interventions on Cardiovascular Health	114	9	961 - 973	Contemporary Reviews in Cardiovascular Medicine Cardiovascular Health	961
2006	Pitsavos, Christos; Panagiotakos, Demosthenes; Weinem, Michael; Stefanadis, Christodoulos	Diet, Exercise and the Metabolic Syndrome	3	3	118 - 118	The Review of Diabetic Studies	118
2007	Pekhlivanov, B.; Kaleva-Khodzheva, N.; Orbetsova, M.; Mitkov, M.	Metabolic syndrome in women with polycystic ovary syndrome	46	9	37 - 40	Akusherstvo i ginekologija	37
2007	Rasouli, Parsa; Lu, Xiangyi;	Potential Long-Term Consequences of Fad Diets on Health, Cancer, and Longevity: Lessons Learned from Model Organism Studies	6	2	247-253	Technology in Cancer Research and Treatment	247
2013	García Reyes, Luis Enrique	Exposure To Fad Diet Advertising Among Youth And Young Adults In Canada	53	9	1689 - 1699	Journal of Chemical Information and Modeling	1689
2016	Daulatabad, Deepashree; Grover, Chander; Singal, Archana	Quality of life and psychological impact of premature canities: A study from North India	3	1	24 - 28	Pigment International	24
2016	Anand, Sonia S; Hawkes, Corinna; Souza, Russell J De; Mente, Andrew; Nugent, Rachel; Zulyniak, Michael A; Weis, Tony; Bernstein, Adam M; Kromhout, Daan; Jenkins, David J A; Malik, Vasanti; Martinez-, Miguel A	Food Consumption and its Impact on Cardiovascular Disease: Importance of Solutions Focused on the globalized food system:	66	14	1590 - 1614	Journal of the American College of Cardiology	1590
2016	Pitt, Christopher E.	Cutting through the Paleo hype: The evidence for the Palaeolithic diet	45	1	35 - 38	Australian Family Physician	35
2018	Blanton, Jarad	Implications of the Ketogenic Diet on Metabolic Syndrome	1	NA	1-28	Eastern Illinois University	1
2019	Yu, Edward; Malik, Vasanti S; Hu, Frank B	Cardiovascular Disease Prevention by Diet Modification	72	8	914 - 926	Journal of the American College of Cardiology	914
2019	Greaves, Colin Poltawski, Leon Garside, Ruth Briscoe, Simon	Understanding the challenge of weight loss maintenance: a systematic review and synthesis of qualitative research on weight loss maintenance	11	2	145-163	Health Psychology Review	145
2020	Barbosa, Claudiane Maria; Figueiredo, Vivian Paulino; Barbosa, Maria Andréa; Cardoso, Leonardo Máximo; Alzamora, Andréia Carvalho; Cardoso, Leonardo Máximo; Alzamora, Andréia Carvalho	Maternal high-fat diet triggers metabolic syndrome disorders that are transferred to first and second offspring generations	123	1	59 - 71	British Journal of Nutrition	59

Table 2: Summary of word frequency query results (20 words at 5 lengths)

Word	Length	Count	Weighted percentage (%)
Associated	10	317	0.25
Author	6	337	0.26
Available	9	324	0.25
Cardiovascular	14	316	0.24
Consumption	11	308	0.24
Diabetes	8	416	0.32
Dietary	7	524	0.41
3.Diets	5	561	0.43
Disease	7	515	0.40
2.Health	6	620	0.48
Insulin	7	312	0.24
Intake	6	361	0.28
Manuscript	10	338	0.26
Metabolic	9	392	0.30
Pubmed	6	381	0.30
Studies	7	362	0.28
Study	5	484	0.37
Syndrome	8	390	0.30
1.Weight	6	716	0.55
Women	5	342	0.26

Table 3: Reference list based on the literature of diet &metabolic syndrome

Reference Type	Author	Year	Title	Publisher	Volume	Issue No.	Pages	Section
Journal Article	Barbosa et al.	2020	Maternal high-fat diet triggers metabolic syndrome disorders that are transferred to first and second offspring generations	British Journal of Nutrition	123	1	59 - 71	59
Journal Article	Blanton, Jarad	2018	Implications of the Ketogenic Diet on Metabolic Syndrome	Eastern Illinois University	1	1	1-29	1
Journal Article	Pitsavos, et.al	2006	Diet, Exercise and the Metabolic Syndrome	The Review of Diabetic Studies	3	3	118 - 118	118
Journal Article	Pitt, Christopher E.	2016	Cutting through the Paleo hype: The evidence for the Palaeolithic diet	Australian Family Physician	45	1	35 - 38	35

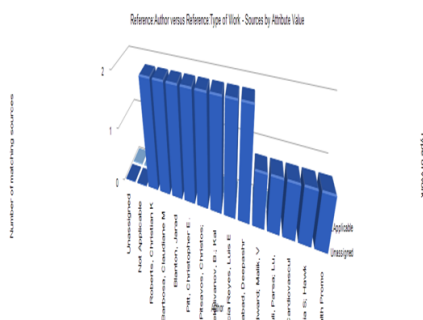


Fig. 5: Author vs. Type of work as per Reference list of all selected studies

The word cloud also depicted that fad diets are often discussed for weight management among women worldwide. The point was further strengthened by the cluster analysis that authors are concerned with the work type by references irrespective of attribute values.^{25–27} The review study was the done for the well-being of the society who are directly or indirectly not aware of the proper uses of diet plan. However, other important factors such as social awareness advise to practise yoga and other exercises to cope with syndromes such as hypothyroidism, polycystic ovarian syndrome, diabetes, and different lifestyle diseases.^{25–28}

Table 4: Reference list based on the literature on diet, exercises, & metabolic syndrome

Reference Type	Author	Year	Title	Publisher	Volume	Issue No.	Pages	Section
Journal Article	Daulatabad et al.	2016	Quality of life and psychological impact of premature canities: A study from North India	Pigment International	3	1	24-28	24
Journal Article	García Reyes, Luis Enrique	2013	Exposure To Fad Diet Advertising Among Youth And Young Adults In Canada	Journal of Chemical Information and Modeling	53	9	1689 - 1699	1689
Journal Article	Pekhlianov et al.	2007	Metabolic syndrome in women with polycystic ovary syndrome	Akusherstvo i ginekologiya	46	9	37-40	37
Journal Article	Roberts, Christian K.; Barnard, R. James	2005	Effects of exercise and diet on chronic disease	Journal of Applied Physiology	98	1	3 - 30	3

Table 5: Reference list based on the literature on diet & cardiovascular diseases

Reference Type	Author	Year	Title	Publisher	Volume	Issue No.	Pages	Section
Journal Article	Yu, Edward; Malik, Vasanti S; Hu, Frank B	2019	Cardiovascular Disease Prevention by Diet Modification	Journal of the American College of Cardiology	72	8	914-926	914
Journal Article	Ignatius G.E. Zarraga, MD; Ernst R. Schwarz.	2006	Impact of Dietary Patterns and Interventions on Cardiovascular Health	Contemporary Reviews in Cardiovascular Medicine Cardiovascular Health	114	9	961-973	961
Journal Article	Anand et al.,	2016	Food Consumption and its Impact on Cardiovascular Disease: Importance of Solutions Focused on the globalized food system:	Journal of the American College of Cardiology	66	14	1590 - 1614	1590
Journal Article	Rasouli, Parsa; Lu, Xiangyi;	2007	Potential Long-Term Consequences of Fad Diets on Health, Cancer, and Longevity: Lessons Learned from Model Organism Studies	Technology in Cancer Research and Treatment	6	2	247-253	247

5. Conclusion

The systemic review study is essential for a severe issue like crash dieting practices through various unscientific fad diets for instant weight loss or metabolic syndrome. As scientists or medical professionals, authors are currently highly concerned about public health safety towards fad diets. The reason is they are not often customized or following respective published dietary or other medical guidelines. More research is required to understand the fad diets' safe and unsafe parts for metabolic syndrome.

6. Source of Funding

None.

7. Conflict of Interest

None .

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