

SCOPING REVIEW PROTOCOL TO MAP A DECADE RESEARCH PATTERN IN INTERMITTENT FASTING AMONG OVERWEIGHT AND OBESE ADULTS

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ABSTRACT

The yearly rise in overweight and obesity cases can be observed despite various efforts being done such as epidemiological, diet and exercise programmes, and research. Dietary alteration such as intermittent fasting has shown a promising outcome in weight management as people are refraining from consuming any calories for a period of time. In this paper, we provide the framework for a scoping review protocol to identify the scope of intermittent fasting in the last ten years among overweight and obese adults. Following the Arksey and O'Malley method, the protocol for this scoping review was conducted in 5 stages: Identifying the research question, identifying relevant studies, study selection, charting the data and organizing, summarising and reporting the results. The search was conducted based on identified keywords, inclusion and exclusion criteria, including Malay and English language and spanning from 2010 to 2019. The selected literature studies from Embase, Ovid, Pubmed, Cochrane Library, ClinicalTrial.org, Google scholar and theses were scrutinized for their relevance in-line with our scoping target and data will be extracted from the selected literature. Findings of this work will give an overview of the research been conducted for intermittent fasting approach in view for weight management in a span of last 10 years. Potential research can be conducted by taking the research gap into consideration and how the issues can be addressed.

KEYWORDS: Intermittent fasting, overweight, obese, adult

INTRODUCTION

Globally, overweight and obesity had become a major threat in developing and developed countries (Swinburn et al. 2011). The problems have become a norm in a society, thus substituting the common health issues such as malnutrition and infectious diseases (Pureza et al. 2020). In April 2020, the World Health Organization reported three times the increase in population of obese people globally in the previous three decades. In 2016, nearly two billion adults were overweight, with women exceeding men in this category (World Health Organization 2018). The essential root of this epidemic disease is the disparity between calorie intake and the exhaustion process (De Lorenzo et al. 2018). Nowadays, communities are comfortable with a sedentary lifestyle due to the emergence of finger-tip accessible items ranging from food to entertainment to social needs, adding to the already anti-social lifestyle (Radtke, Jones, and Scherr 2020).

Individuals with a body mass index (BMI) of more than 25 kg/m², are considered overweight (BMI \geq 25 kg/m²) or obese (BMI \geq 30 kg/m²) and they are at higher risk of non-communicable diseases affecting not only daily life but also are more likely to have psychosocial issues such as poor quality of life, anxiety disorder and depression (Folope et al. 2012; Ofei 2005). Many healthcare centres, clinicians and non-governmental organisations (NGOs) are working together with the government to reduce the prevalence of overweight and obese individuals that have been plaguing the community through many campaigns and initiatives (Khan et al. 2009; Sacks, Swinburn, and Lawrence 2009). The prevention strategy should take into consideration of an accessible exercise regime as well as how to alter an individual's diet plan by moving gradually to a healthier choice (Chan and Woo 2010).

In recent years, calorie restrictions by reduction in dietary consumption or fasting have been gaining an intense popularity as an alternative weight loss approach (Patterson et al. 2015). Since calorie-restricted diet on a daily basis is considered intimidating due to continuous commitment, an alternative approach can be followed which is the intermittent fasting (IF) (Hottenrott et al. 2020). IF is the duration of restraining from calorie intake in terms of food and beverage for an extended period of time. The approach of IF is a diet controlled in terms of time allocated for fasting ranging from in a day to a week.

The IF approach has reached a wider community

attention as it had been sensationalised by celebrities in entertainment and sports field and being viral in the social media. However, IF is nothing new as it had been in existence since ancient time for religious beliefs, and also to boost athlete output in sports (Levy and Chu 2019; Veronese and Reginster 2019).

IF methods range from fasting few hours to days as preferred by an individual according to their pace and preferences. There are wide range of IF to choose from such as 16:8 which means fasting for 16 hours and calorie intake for 8 hours, 5:2 (5 days of eating and fasting for another 2 non-consecutive days in a week), alternate day fasting of reducing calorie consumption to about 500 calories during fast day and without restriction on the next day (Antoni et al. 2017; Cioffi et al. 2018) and whole day fasting with at least 2 days of 24 hours fasting in a week in which no calorie intake including beverages (Khedkar 2020; Tinsley and La Bounty 2015).

Adhering to a reduced-calorie intake every day can be a challenging task to overweight people, thus IF would be an attractive approach for the beginners to this phenomenal diet, especially when popularised by celebrities and sports personnel. The 5:2 fasting method is most commonly used by those eager to lose weight (Harris et al. 2018). Intermittent fasting also showed equal weight loss as continuous energy restriction and at the same time have favourable glucose and lipid homeostasis (Antoni et al. 2017). This particular method also had seen higher compliancy rate as participant has a leverage of choosing days they wanted to be fasting rather than being on a continuous energy restriction regime (Harvie and Howell 2017).

An animal model study reported that IF method is much better or similarly beneficial with continuous energy restriction (Carter, Clifton, and Keogh 2016). However, published data on human subject is still limited and not substantial to draw a solid conclusion (Johnstone 2015). Moreover, the IF benefits are being deduced from the findings in animal models with limited sample size (Patterson et al. 2015).

The objectives of this study are to summarize the scope of IF in the previous decade among overweight and obese adults and to identify potential impending areas that need to be addressed in the future targeted research.

MATERIALS AND METHODS

We evaluated the available options to review published research in IF and had narrowed down to scoping review

methodology. Several research databases (Embase, Ovid, Pubmed, Cochrane Library, ClinicalTrial.org, and Google scholar) were examined to determine if a similar topic had been published, however to our best knowledge, we couldn't find any evident similarities. Thus, a collective decision was made and we aimed to identify the gaps in research pattern of IF among obese adults and to suggest future areas that could be possibly explored. The IF is defined as a dietary approach for weight management that involves interspersing normal daily calorie intake with a short period of severe calorie restriction/fasting. We specifically chose IF that restricted calorie intake for a fixed duration to narrow down the searching process. Overweight and obese by definition is abnormal or accumulation of excessive fat that presents a high risk to health well-being and characterized by body mass index (BMI) of 25 or more. Adults are defined as respondents aged 18 years old and above, which also include the elderly population. We conducted the scoping review by utilizing an established scoping review framework by Arksey and O'Malley (2005) and current recommendations by Levac, Colquhoun, and O'Brien (2010). Thus, our scoping review workflow had outlined few stages as being mentioned below to have a systematic process to review various number of literatures.

Stage 1: Identifying the research question

Scoping reviews covers many aspects in the interested research area that would be able to provide a comprehensive detail in the topic of interest. We had outlined concise research questions as the following:

- i. What are the characteristics of IF research among overweight and obese adults in the past 10 years in terms of:
 - a. Number of researches conducted
 - b. Research design and methodology (qualitative and quantitative)
 - c. Scope and topics of IF research
- ii. What are the research gaps and the potential research that can be conducted in future as there were no suitable conceptual frameworks pertaining to this topic, the scopes were classified into weight loss, anthropometry, metabolic, cardiology, immunology, haematology, physiology, psychology and cancer prevention.

Stage 2: Identifying relevant studies

A comprehensive search was conducted for primary studies, scientific reviews and grey literature from the

mentioned databases as well as local thesis available online. The research was limited to publication from January 2010 to December 2019. Subject headings and list of keywords were developed and referred during the database search as shown in Table 1 below. The keywords were a combination of Boolean operators (AND, OR, NOT), adjacencies and truncations. The search was conducted by trained researchers and the literature references were exported to reference management software Endnote v.X9, in a RIS/nbib file. Duplicates were identified and excluded, and the remaining references were uploaded to Microsoft Excel spreadsheet.

Stage 3: Study selection

The screening process involved two steps. In the first step, following successful removal of the duplicate references, the selected titles and abstracts were screened based on eligibility criteria (Table 1 and 2) and whether the content will answer the research questions. The second step involved in downloading the full texts for the selected and identified literatures and equally distributed between the team members. Two researchers were paired and work independently to screen the full text and were needed to justify the reasons for articles' exclusions. At the end, discrepancies were shared. Any discordant full-text articles were reviewed for a second time and further disagreements about study eligibility at the full-text review stage were resolved through discussion with a third investigator until full consensus was obtained. The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) diagram (2009) was used as a guide to record the number of articles selected in each process.

Stage 4: Charting the data

The selected literatures from the previous stage were gathered and again distributed among the team members. Initially, few members went through some of the articles to get an understanding to the conceptual form and get an idea of the necessary data to be identified and extracted out that would be able to answer outlined research questions. To ensure accurate data collection, each reviewer's independent abstracted data were compared and any discrepancies were further discussed to ensure consistency between the reviewers. The data were compiled into a single spreadsheet in Microsoft Excel software for validation and coding. The standardised data extraction procedure with all detail information was then finalised and agreed by the team

Table 1: List of identified keywords

		KEYWORDS		
SYNONYMS	Obese	Adult	Intermittent fasting	
	overweight	m*n	energy restriction	
	pre obese	wom*n	alternate day fasting	
	body weight	worker	religious fasting	
	Body mass index	humans	calorie restriction	
	waist hip ratio	patients	periodic restriction	
	waist circumference	adults	periodic fasting	
	weight gain	individuals	fasting	
	weight loss	students	time restricted feeding	
	fat	human subjects	starvation	
	adiposity	persons		
	anthropometry	diabetics		
	obesity	elderly		
	metabolic syndrome	male		
	cardiovascular risk factors	female		
		old people		
		senior citizen(s)		
	housewife(s)			

Table 2: Inclusion and exclusion criteria outlined for literature acceptance for scoping review

INCLUSION CRITERIA	EXCLUSION CRITERIA
i. Published articles from January 2010 to December 2019	i. Long period of fasting such as prolonged fasting
ii. Articles languages: Malay and English	ii. Fasting mimicking diet
iii. Type of articles: Primary studies, technical reports, and review articles (systematic review, narrative review or review paper)	
iv. Human based research	
v. Study population: adult, overweight and/or obese	
vi. Types of IF: 5:2 diet, 16:8 diet, 12:12 diet, alternate day fasting, Ramadhan fasting	

members as presented in Figure 1.

Stage 5: Organizing, summarising and reporting the results

The ultimate purpose of the scoping review was to gather the scattered research, transforming it into a meaningful information with an insight of the conducted research, attaining important findings for potential research questions pertaining to the research gaps & limitations. and finally, in planning relevant strategies for future research scope.

CONCLUSION

In conclusion, this protocol paper presented a systematic approach to perform a scoping review assignment to synthesize the extend of research conducted in intermittent fasting which targeting the overweight and obese adults for the previous 10 years. Outcome of the paper provides an insight relating to the research trends and identifying the limitation in intermittent fasting that can be tackled by future researchers. The information gathered will also be suggestive measures to the policy

No	Study (study name/Author/year)	Study design (quantitative/ qualitative/mixed/ review)	Scope (cardio/immuno/weight loss/cancer prevention/metabolic/ neuro/hemato/psycho/ physiology)	Purpose	Participants characteristics (age/gender/ sample size)	Country	Comparison group	Method of IF and duration	Findings	Limitation/gap
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Figure 1: Parameters for data extraction tables to assist in identifying the key component in the literature

makers in tackling the management of obesity among the Malaysian community.

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