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A REVIEW ON SOCIODEMOGRAPHIC AND LIFESTYLE DETERMINANTS OF CHRONONUTRITION PRACTICES IN YOUNG ADULTS

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ABSTRACT

Chrononutrition which examines the interaction between meal timing and circadian biology has emerged as an important determinant of physical and mental health. Young adulthood represent a critical life stage characterized by irregular schedules, academic or occupational pressures and evolving lifestyle habits that may disrupt optimal eating timing. Beyond nutritional quality when food is consumed may be strongly influenced by Sociodemographic characteristics and daily life style behaviors. Evidence suggest that factors such as age, gender, educational, environment, socioeconomic status, sleep patterns and physical activity play a pivot role in shaping chrononutrition practices including meal timing, eating window duration, breakfast consumption and evening or night eating. Disruptions in these practices have been associated with adverse metabolic outcomes and psychological distress including stress, anxiety and depressive symptoms. This review synthesizes current evidence on the Sociodemographic and lifestyle determinants of chrononutrition practices among young adults. Understanding these determinants is essential for designing targeted interventions aimed at improving chrononutrition behaviors and promoting health in young adult populations.

Key words: Chrononutrition, Meal timing, Circadian rhythm, young adults

INTRODUCTION

The transition from adolescence to adulthood is marked by substantial changes in biological rhythms, social roles and lifestyle behaviors. During this period young adults often experience increased autonomy over food choices, irregular daily routines and competing academics or professional demands[1]. While traditional nutrition research has largely focused on dietary composition and caloric intake, growing evidence underscores the importance of when food is consumed in relation to endogenous circadian rhythms[2, 3]. Chrononutrition an emerging field within nutritional science explore how the timing, frequency and regularity of eating occasions interact with biological clocks to influence health outcomes[4, 5]. Unlike traditional nutritional paradigms that emphasize dietary composition and calorie balance chrononutrition highlights when food is consumed as an equally critical determinant of physiological homeostasis[6, 7]. The human body operates through an intrinsic circadian timing system, orchestrated primarily by the suprachiasmatic nucleus in the hypothalamus, which regulates metabolic processes, hormonal secretion, sleep wake cycles and behavioral patterns over a 24 hour period[8, 9]. Young adults are particularly prone to sub optimal chrononutrition practices including delayed first meals, prolonged eating windows, frequent breakfast skipping and late night eating[10]. These behaviors may be shaped by a complex interplay of Sociodemographic factors such as gender, socioeconomic background and educational status and lifestyle characteristics including sleep patterns, physical activity and psychosocial stress[11, 12]. Disturbances in chrononutrition have been linked not only to cardiometabolic risk but also to mental health outcomes. Adulthood represent a transitional life stage characterized by profound biological, psychological and social changes[13]. During this phase individuals often develop autonomy over dietary habits while simultaneously encountering irregular schedules, academic pressures, occupational demands and social engagements.these factors collectively contribute to disruptions in circadian alignment[14]. Recent evidence indicates that irregular chrononutrition practices are associated with adverse health outcomes including impaired glucose metabolism, increased adiposity, dyslipidemia and heightened risk of cardiometabolic disorders[15, 16]. Despite increasing interest in chrononutrition less attention has been given to understanding the determinants that that underlie chrononutrition practices in young adults[17]. Identifying these determinants is essential for determining the observed associations between eating timing and mental health and for developing effective population specific interventions[18]. This review therefore aims to synthesize existing evidence on the Sociodemographic and lifestyle factors influencing chrononutrition practices among adults.

OVERVIEW OF CHRONONUTRITION PRACTICES IN YOUNG ADULTS

Chrononutrition encompasses several behavioral dimensions including timing of first and last meals, including timing of the first and last meals, duration of last eating window, regularity of meal timing and alignment of eating occasions with sleep wake cycles[19, 20]. Studies among young adults consistently report less structured eating

patterns compared with older populations with a tendency toward delayed meals and extended eating periods[21]. University based samples often demonstrates high variability in meal timing across weekdays and weekends reflecting academic schedules and social activities[22]. Community based young adults while sometimes exhibiting earlier meal initiation may engage more frequently in energy dense food consumption during last hours[23]. Common chrononutrition behaviors observed in this age group include frequent breakfast skipping, evening eating and short intervals between the last meal and sleep onset. Such patterns indicates misalignment between food intake and circadian rhythms which may contribute to physiological and psychological dysregulation over time[24].

SOCIODEMOGRAPHIC DETERMINANTS OF CHRONONUTRITION PRACTICES

GENDER

Gender difference in chrononutrition behaviors have been observed across studies. Female young adults are over represented in university based research and may display distinct meal timing patterns compared with males[25, 26]. While some evidence suggest females are more likely to engage in breakfast skipping, others report greater irregularity in meal timing among males. These variations may reflect differences in health awareness, body image concerns and social roles[27].

EDUCATIONAL AND OCCUPATIONAL STATUS

Educational environment plays a significant role in shaping chrononutrition practices. University students frequently exhibit delayed meal timing, irregular eating schedules and prolonged eating windows likely driven by academic workload, class schedules and late night study habits[28]. In contrast community based young adults engaged in structured employment may demonstrate earlier meal initiation but poorer food choices during evening hours.

SOCIOECONOMIC STATUS

Socioeconomic status influence access to food, daily routine and health related behaviors. Young adults from lower socioeconomic status backgrounds may experience greater constraints on meal timing due to shift work, financial limitations or limited access to healthy foods, leading to increased reliance on late or irregular meals[29, 30]. Higher socioeconomic status has been associated with greater nutritional awareness which may moderate the impact of late eating on diet quality.

LIFESTYLE DETERMINANTS OF CHRONONUTRITION PRACTICES

➢ Sleep patterns, Circadian Alignment and chronotype

Sleep duration, sleep timing and chronotype are closely intertwined with chrononutrition. Sleep behavior is one of the most influential determinants of chrononutrition. The timing duration and quality of sleep directly interact with eating patterns through bidirectional mechanisms[31]. Individuals with an evening chronotype tend to delay both sleep and food intake often consuming meals later in the day and engaging in night time snacking[32]. This delay the fasting period overnight and disrupts metabolic processes such as insulin sensitivity and lipid metabolism[33].Young adults with evening chronotypes are more likely to delay meals, consume food late at night and have shorter intervals between eating and sleep. Irregular sleep schedules further exacerbate meal timing variability contributing to circadian misalignment[34].

➢ Physical activity

Physical activity patterns may indirectly influence chrononutrition behaviors. Physical activity contributes to the structuring of daily routines indirectly influencing meal timing and regularity. Individuals who engage in regular exercise are more likely to maintain consistent eating schedules aligned with their activity patterns[35]. Morning exercisers often exhibit earlier meal timing and better synchronization with circadian rhythms. Conversely sedentary lifestyles are associated with irregular eating behaviors, increased snacking frequency and prolonged eating windows[36]. Late evening physical activity may also delay dinner timing or encourage post exercise calorie intake contributing to nighttime eating patterns. Active individuals often report more structured daily routines which can support regular meal timing[37]. However late evening exercise or sedentary lifestyles may also promote delayed eating and night time snacking.

➢ Psychosocial stress and emotional factors

Psychological stress is a critical determinant of Chrononutrition behaviors particularly among students and early career individuals. Stress can disrupt appetite regulation through activation of the hypothalamic pituitary adrenal axis leading to altered cortisol levels[38]. Elevated cortisol may premote cravings for energy dense foods and irregular eating patterns. High stress levels common among students and early career professionals can disrupt appetite regulation and meal timing[39]. Stress related behaviors such as skipping meals, emotional eating and late night food consumption are frequently reported[40]. These lifestyle pressures may act both as determinants and consequences of poor chrononutrition practices.

➢ Dietary habits and eating behaviors

Beyond timing habitual dietary patterns influence chrononutrition practices. Individuals with unhealthy dietary behaviors such as frequent consumption of processed foods or high sugar snacks are more likely to engage in irregular eating schedules. Late night eating is often associated with energy dense nutrient poor foods which can impair metabolic health[41].

➢ Screen time, technology use and digital exposure

The widespread use of digital devices has significantly impacted lifestyle behaviors, including chrononutrition. Prolonged screen exposure particularly at night delays sleep onset by suppressing melatonin secretion[42]. This delay shifts both sleep and meal timing often resulting in late dinners and night time snacking.

Common patterns include:

- Eating while using smartphones or watching television.
- Mindless snacking during screen time.
- Delayed meals due to prolonged digital engagement[43].

➢ Work schedules, acdemic demands and routine structure

Irregular work or study schedules are major contributors to disrupted chrononutrition patterns. Shift work, part time jobs and late night study sessions can lead to inconsistent meal timing and reliance on convenient often unhealthy food options[44].

Students frequently experience:

- Skipped meals due to time constraints.
- Late night eating during study sessions.
- Irregular meal timing between weekdays and weekends[44, 45].

IMPLICATIONS OF MENTAL WELL BEING

Chrononutrition shaped by Sociodemographic and lifestyle factors have important implications for mental health. Evidence indicates the late eating, short evening latency and breakfast skipping are associated with higher levels of stress, anxiety and depressive symptoms among young adults[46, 47]. These associations may be mediated by sleep disruption, hormonal dysregulation and impaired metabolic signaling. This appears bidirectional relationship with psychological distress also contributing to irregular eating timing[48].

CONCLUSION

Chrononutrition practices in young adults are shaped by a complex interaction of Sociodemographic characteristics and lifestyle behaviors. Gender, educational context, socioeconomic status, sleep patterns, physical activity and psychosocial stress collectively

influence meal timing, eating regularity and alignment with circadian rhythms[49]. Understanding these determinants is essential for interpreting associations between chrononutrition and mental health outcomes. Interventions addressing both lifestyle behaviors and structural determinants may help promote healthier chrononutrition patterns and support mental well being among young adults[50].

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