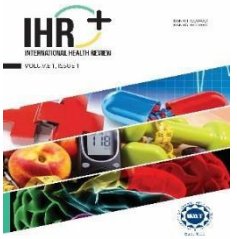

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Effect of Dietary Habits on Mental and Physical Health: A Systemic Review

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Abstract

Mental and physical health issues have increased over the past few decades. Individual's lifestyle, environment, dietary habits, physical and mental fitness are associated with each other. Generally, youngsters adopt unhealthy dietary habits, such as poor diet, little or no milk intake, meal skipping, preference for energy dense over nutrient dense diet, and inadequate intake of vegetables and fruits. During their university life, students face many changes including poor dietary choices, study stress, anxiety, depression, food insecurity, skipping meals, poor fruit and milk consumption. All of this may lead to many chronic diseases later in life. Processed food causes a lot of health issues. Individuals are more susceptible to irritable bowel syndrome, liver disorders, and amenorrhea due to unhealthy dietary consumption. For this reason, moderation in diet is necessary. A well-balanced nutritious diet consists of five food groups including whole-grains, milk, fruits and vegetables, meat and nuts, and oil which lower disease risk and increase the lifespan. Body size idealism is also the lead cause of eating disorder, especially among teenage girls. The objective of this study was to overview the association of dietary habits with the physical and mental health of people by analyzing the findings of previously published literature. Poor dietary choices and habits lead to poor physical health, classroom performance, and memory retention. It also leads to psychological issues, such as anxiety and depression.

Keywords: depression, dietary habits, eating disorders, health issues, malnutrition, weight issues

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Introduction

Dietary habits are the food choices routinely made by individuals. They vary from person to person. A good food choice keeps both the body and mind healthy. Changes in lifestyle s are important for preventing disease and improving health right from adolescence to adulthood. During this period, a person is projected to develop food habits that are unhealthy and harm vitality [1].

The unhealthy food choices may cause overweight and obesity among university students. Skipping meals is most common among them. Food availability, cost and accessibility, and educational stress also affect their food choices [2]. Those who stay in hostels, may increase their fast food and sugar intake but also decrease their intake of raw or cooked vegetables and fresh fruits [3].

An individual's environment and physical or mental fitness are interconnected and affect each other. Dietary habits, environmental factors, mental and physical health can lead to many chronic ailments *i.e.* infectious diseases,[4] accelerated aging, cancer, coronary heart disease, [5] DNA mutation and immune system disorder, etc. During university years many students experience changes in their lifestyle and develop inappropriate dietary habits *i.e.* taking high sodium and fatty, and low iron and calcium food, high energy intake, and skipping meals. Many of these don't fulfil the normal body needs of vegetables, fruits and other dietary intake [6].

Obesity is one of the the major issues of the e modern world [7]. A study shows that skipping breakfast and poor dietary habits negatively affect the entire human body, and are the main cause of long term obesity. Healthy breakfast significantly affects nutritional status of a person. The students who regularly skip breakfast are at a greater risk of health problems and growth deficit [8].

Inadequate access to food sources is a major cause of poor food habits and increases the risk of chronic diseases [9]. In the low income society, fresh vegetables and fruits are not easily available. If available, their cost is higher than of other food. The high fat, high sodium foods can cause chronic diseases. Poor lifestyle and dietary habits can cause many gastrointestinal problems *i.e.* nausea, vomiting, heartburn, GERD, IBS etc. Many researches

have established that lifestyle or food intake and irritable bowel syndrome are interlinked. Diet containing high amount of spice and fat and less amount of FODMAPs (fermented oligo-di-monosaccharides and polyols) is supposed to increase gastrointestinal symptoms [10].

Behavior, mood swings, attention and anxiety are closely related to food habits. Many people who have poor diet, also have mood and personality disorders. These poor foods contain high content of fat and sugar and low portions of vegetable and fruits. Different modified diets are used to treat mood and behavioral disorders. These diets have high content of fatty acids and low amount of sugar [11].

Physical activity also enhances learning and cognitive abilities. A study concluded that most university students have poor food habits. They eat less vegetables and fruits, meat and meat products and dairy products [12]. Food habits affect immune system, which can cause depression. Food which contains less antioxidants, also causes psychological disorders [13].

Materials and Methods

In this review, these researchers utilized the Preferred Reporting Items for Meta-Analysis (PRISMA) statement and systematical reviews guidelines in order to scrutinize the relationship between food habits and physical and mental health. They included full length documents, primarily written in the English language from three different databases: Wiley, PubMed and Science Direct. They chose research papers published from 2000 to 2019. The terms used for search in the databases were: “Dietary habits”, “Diet and physical health”, “Diet and mental health”, “Poor dietary habits”, and “Lifestyle habits”.

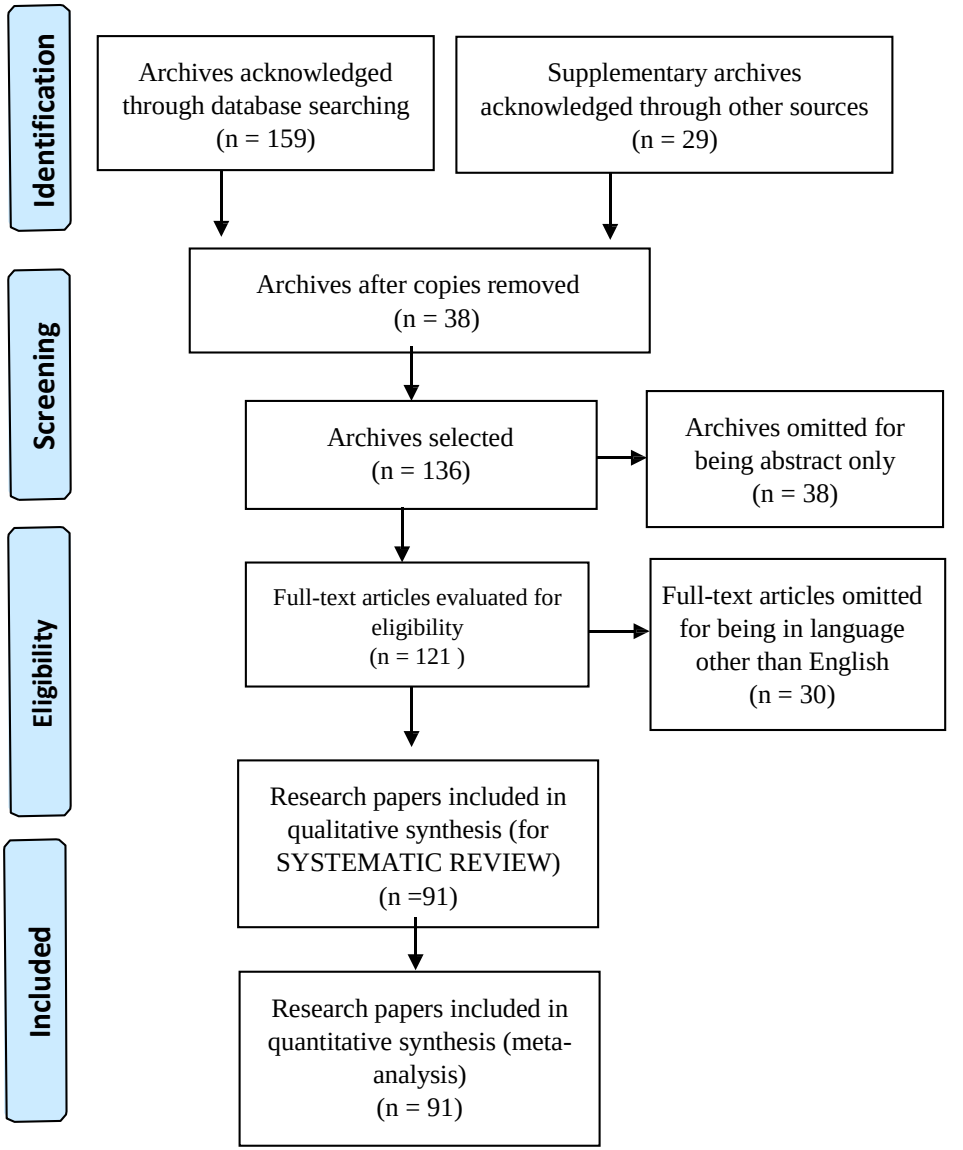
The researchers individually separated all abstracts and titles. The research studies chosen for this review paper were cross-sectional and observational. The finally chosen articles were gone through by a single reviewer exclusively to preserve appropriate data for appraisal.

Exclusion and Inclusion Criteria

The inclusion criteria for this study was: (1) Cross sectional studies, (2) Observational studies, (3) Randomized control trials. Studies which were in other languages such as Korean and Japanese, were excluded. Studies which

were abstract only, or locked or unavailable in our region, were also excluded.

PRISMA Flow Diagram



Results

Table 1. Systematic Review of the Papers and their Findings

Sr. No.	Name of Author	Year of Publishing	Sample Size	Results and findings
1	Tominaga S, Yamamura Y, Huang XE, Tajima K, Hamajima N, Kodera Y, Xiang J, Tokudome S	2000	877	Findings show that food habits, smoking and drinking have significant role in the progression of stomach cancer. Regular intake of tofu and raw vegetables is promising, whereas regular smoking is a risk factor for stomach cancer.
2	Une H, Kaetsu A, Shibata K, Miyazaki M, Fukushima T, Moriyama M	2000	636	More consumption of green tea was negatively linked with the progression of chronic atrophic gastritis.
3	Melim A, Mira L, Torres IC, Ornelas CP	2000	87	In the fishing village group, who consumed ten times more fish than the rural village group, higher serum levels of DHA and EPA and lower serum levels of triacylglycerol and total cholesterol were found as compared to the rural village group.
4	Haan M. A, Flatt SW, Pierce JP, Faerber S, Wright FA, Rock CL, Newman V, Kealey S, Jones VE, Caan BJ, Gold EB,	2002	3008	Consumption of low-fat, high vegetable diet produces carotenoids concentration in circulation and reduces the risk of cancer especially breast cancer.
5	Trudeau E, Patterson RE, Satia JA, Kristal AR, Neuhouser ML	2002	838	Dietary habits and psychosocial factors were strongly interlinked.
6	Croft JB, Giles WH, Greenlund KJ, Mensah GA, Keenan NL	2002	52623	Results show that diet low in saturated fats, rich in vegetables and fruits and regular physical activity prevent stroke.
7	Yu AL, Ho SC, Woo J	2002	2032	Mediterranean diet (high in vegetables, fruits, vegetables and olive oil) has been shown to prolong the survival in elderly Greeks. Study suggests that lifestyle factors are important even in this age group.

Sr. No.	Name of Author	Year of Publishing	Sample Size	Results and findings
8	Williams RB, Siegler IC, Barefoot JC, Grønbæk M, Feaganes JR, McPherson RS	2002	4434	Finding shows that more wine consumption and more intake of vegetables and fruit, high intake of fiber have low prevalence of smoking. Whereas those who consume less or no wine reported high fat intake, lower intake of vegetable intakes, less physical activity and more BMI values.
9	Wall C, Leydon MA	2002	20	40% jockeys were underweight, 20% had disordered eating, and 44% were osteopenic.
10	Sujoldžić A, Skreblin L	2003	508	Environmental characteristics have an important impact on dietary habits in adolescent populations.
11	Malhotra M, Soni D, Sharma JB, Murthy NS,	2003	1150	In vegetarian women, 96.18% were anemic.
12	Rose RJ, Kaprio J, Keski-Rahkonen A, Rissanen A, Virkkunen M,	2003	5448	Findings show the relationship of breakfast skipping with alcohol use, sedentary lifestyle and smoking.
13	Stumbo PJ, Gilmore JM, Marshall TA, Levy SM, Broffitt B, Warren JJ, Eichenberger, Burns TL	2003	642	Regular consumption of powder beverages soda and some juice increased the risk of caries.
14	Rockett HR, Li YF, Xie B, Gilliland FD	2003	3201	Findings show that only calcium sample meets the RDA of all nutrients, but the overall dietary intake was not according to the food pyramid.
15	Tsugane S, Higuchi K, Montani A, Sasazuki S, Inoue M, Arakawa T	2003	1071	Findings show that the consumption of rice increases the risk of atrophic gastritis in Japanese women.
16	Pickett W, King Ma, Janssen I, Boyce WF, Katzmarzyk PT,	2004	7266	Findings show boys and girls tend to become overweight and obese with decreased physical activity.
17	Luecken LJ, Huntsinger ET	2004	793	Findings show that early life habits may affect dietary habits and health behavior of people.
18	Bellisie F, Nillapun M, Wardle J, Haase AM, Steptoe A, Jonwutiwes K	2004	44	Result shows the ways of motivating men to take as much benefit of strategies to ensure long-term health as women do.

Sr. No.	Name of Author	Year of Publishing	Sample Size	Results and findings
19	Jutai JW, Biggar DW, Steele CA, Rossen BE, Kalnins IV, Bortolussi JA	2004	318	In adulthood, less exercise increases the risks of CVDs, lowers the quality of life and gives poor mental health.
20	Espelage DL , Thome J	2004	321	In males, physical activity is linked to positive mental health, whereas, in females it is linked to both negative and positive mental health.
21	Bridges DM, Guan J, Keating XD, Piñero JC	2005		Students will not increase their physical activity simply because they are asked to. This is evident in the results of intervention studies that show only moderate overall effects of enhanced physical activity.
22	Gil J, Gil S, Irazusta A, Ruiz F, Gondra J, Jauregi A, Irazusta J	2006	104	Physically active students were more conscious of the important of good health and nutrition.
23	Unusan N	2006	116	Optimism and self-confidence were also positively linked to the h benefits of taking vegetables and fruit.
24	Lien L	2007	131	Boys face consequences of skipping breakfast on their academic performance and mental distress more than girls.
25	Scott JA, Papadaki A, Hondros G, Kapsokefalou M	2007	84	Nutrition interventions encouraged students to promote healthy dietary habits and lifestyle.
26	Chow HP	2007	373	Physical fitness is also an important indicator of students' mental well-being.
27	Wahid AA, Razak AZ, Hoque KE, Kamaluddin MA	2007	400	Findings show that promoting healthy eating habits at primary level can improve students learning and health behaviors.
28	Sawada S, Matsuzuki H, Oida Y, Arao T, Maruyama C, Mutou T, Nakanishi Y	2007	192	Lifstyle modification shows positive effect on systolic blood pressure, LDL-cholesterol and BMI.
29	Lahelma E, Roos E, Sarlio-Lähteenkorva S, Lallukka T	2007	5346	In conclusion the balance between family and work may promote health-related behaviors.

Sr. No.	Name of Author	Year of Publishing	Sample Size	Results and findings
30	Boi MF, Cuomo R, Usai PA, Manca R, Lai MA	2007	1130	As compared to healthy controls, patients with coeliac disease and IBS , significantly face lower health-related quality of life.
31	Villareal RC, Napoli N, Thompson J, Civitelli R, Armamento-	2007	168	Results show that females who take calcium rich diet and supplements have lower ratio of bone damage. Calcium is also good for estrogen metabolism.
32	Sinigaglia L, Casari S, Varenna M, Binelli L, Zucchi F	2007	1771	Findings show that low diet intake may increase the risk of osteoporosis .
33	Pfeiffer AF, Weickert MO	2008		Gel- forming and viscous properties of soluble dietary fibers prevent absorption of macronutrient. It positively affects blood lipids, and decreases postprandial glucose response.
34	Navis G, Boomsma F, Vogt L, Waanders F, de Zeeuw D	2008	34	HCT and low-sodium diet shows positive effect in reducing blood pressure and proteinuria.
35	Covas MI, Munoz MA, Marrugat J, Fito M, Schroeder H	2008	8195	Results show that adherence to the Mediterranean diet was related to the more scoring for self-perceived health.
36	Carta L, Angel M, Roman B	2008	36	Mediterranean diet helps reduce cardiovascular disease.
37	Cabral CR, Ferreira HS, Assunçao ML, dos Santos AF, Florêncio TM	2009	40	Findings show that taking supplements with coconut oil prevents dyslipidemia and also helps reduce abdominal obesity.
38	Perveen S, Fatima K, Nisar N, Qadri MH,	2009	384	Cold drinks and fast food generates overweight. Whereas, whole grains an d physical activity helps reduce weight.
39	Pajak A, Boylan S, Welch A, Pikhart H, Malyutina S, Milla L, Simonova G, Kubinova R, Bragina O, Stepaniak U, Gilis-Januszewska A,	2009	26,870	65% of people consumed adequate minerals like calcium, potassium and magnesium. 16% of them met the WHO recommendations for PUFA. Vegetables and fruits consumption were lower than advised.

Sr. No.	Name of Author	Year of Publishing	Sample Size	Results and findings
40	Oddy WH, Jacoby P, O'Sullivan TA, Robinson M, Miller M, Kendall GE, Silburn SR	2009	8036	These findings show that in the early adolescence the quality of breakfast is a significant constituent in the complex relations between mental health and daily life factors.
41	Mays MZ, Jacobson D, Melnyk BM, Kelly S, O'Haver J, Small L	2009	19	Results showed that adolescents busy in reading opportunities for themselves, face less anxiety and depression and expand their healthy lifestyle choices.
42	Matlas AL, Tourlouki E, Panagiotakos DB	2009	8	Findings show that good dietary habits help prevent CVDs and also improve the quality of life.
43	Sharaf F, Midhet F, Al Mohaimeed AR	2010	2789	Health education will lessen the incidence of non-communicable diseases in the targeted audience.
44	Jones E, Maggini S, Kennedy DO, Veasey R, Watson A, Dodd F, Haskell CF.	2010	215	Supplements are beneficial for individuals. Additional supplements lower stress and other mental illnesses in people , and also positively impact their cognitive behavior.
45	Sharaf FK, Midhet FM, Al-Mohaimeed AA,	2010	498 (283 Type 2 DM & 215 Non-Diabetic)	Active lifestyle and good dietary habits lower the risk of insulin independent diabetes among individuals despite the family history of Diabetes Mellitus.
46	Allegrante JP, Logi Kristjánsson Á, Dóra Sigfúsdóttir I	2010	2000	Physical activity, good dietary habits and low BMI all are inter-linked and lead to good academic results, and better lifestyle, also boosting self-confidence.
47	Lionis C, Mamplekou E, Bountziouka V, Psaltopoulou T, Zeimbekis A, Pounis G, Tsakoundakis N, Papaerakleous N, Gotsis E, Metallinos G, Polychronopoulos E,	2010	1190	Harmful dietary habits significantly influence mental health of the elderly and increase depression.

Sr. No.	Name of Author	Year of Publishing	Sample Size	Results and findings
48	Stefanadis CI, Panagiotakos DB, Zampelas AD, Pitsavos CH, Chrysohoou CA	2010	3042	There is no link between inflammatory markers and the dairy products intake among normal audience.
49	Chang KJ, Park JY, You JS,	2010	130	Depressed individuals have poor dietary habits and poor nutrition status.
50	Cheistensen H, Hickie I, Walker JG, Mackinnon AJ, Batterham P, Jorm AF, McCarthy A, Fenech M	2010	909	Folic acid does not lower the mental health severity and is not associated with such any symptoms.
51	Berk M, Hodge AM, Jacka FN, Pasco JA, Mykletun A, Williams LJ, O'Reilly SL, Nicholson GC, Kotowicz MA	2010	1046	Close association between good food habits and sadness and other mental health was observed in targeted audience.
52	Berk M, Jacka FN, Kremer PJ, Williams JW, Leslie ER, Patton GC, Toumbourou JW	2010	7114	Poor quality of diet increases the risk of adolescent depression.
53	Dishman RK, Chai W, Nigg CR, Motl RW, Pagano IS, Horwath C	2010	139	Results show the association between physical activity with fruits and vegetable intake beneficial for individuals having any mental illness.
54	Serra-Majem L, Sánchez-Villegas A, Verberne L, De Irala J, Ruiz-Canela M, Toledo E, Martínez-González MA	2011	12059	Findings show relation between depression and TFA intake whereas no link was found for olive oil, PUFA and MUFA, concluding that depression and CVD have same determinants in fat subtypes.
55	Pasco JA, Jacka FN, Kremer PJ, de Silva-Sanigorski AM,1 Moodie M, Leslie ER, Berk M, Swinburn BA	2011	3040	Results show link between poor food quality and poor mental functioning.
56	Vassilaki M, Chatzi L, Melaki V, Sarri K, Apostolaki I, Koutis A Roumeliotaki T,	2011	529	Good dietary habits during pregnancy like the intake of fruits, vegetables, nuts, pulses olive oil, dairy products and fish, help fight postpartum depressive symptoms.

Sr. No.	Name of Author	Year of Publishing	Sample Size	Results and findings
	Georgiou V, Bitsios P, Kogevinas M			
57	Compte R, Mikulovic J, Marcellini A, Duchateau G, Fardy PS, Vanhelst J, Bui-Xuan G	2011	410	Young people with intellectual deficiency are at risk of being overweight especially those whose parents are overweight too. Their dietary habits are needed to be more observed in order to prevent obesity.
58	Okuyama Y, Okami Y, Kato T, Nin G, Harada K, Wada S, Higashi A, Takakuwa S, Aoi W, Ichikawa H, Kanazawa M	2011	2639	IBS is related to fruits, vegetables and other food intake, leading to results that dietary habits affect it.
59	Beghin L, Garaulet M, Ortega FB, Ruiz JR, Rey-Lopez JP, Molnar D, Manios Y, Cuenca-Garcia M, Plada M, Diethelm K, Kafatos A	2011	3311	Short sleep duration among European adults is linked to lazy lifestyle and poor dietary habits.
60	Musaiger AO, Al-Hazzaa HM, Abahussain NA, Al-Sobayel HI, Qahwaji DM,	2011	2908	At present, sedentary lifestyle of Saudi adults and their low physical activity is a major source of concern urging the need for introducing proper steps and education to handle it. Public health sector should make some good policies to address these issues.
61	Ali S, Rahman S, Sabur A, Parvez AK,	2012	208	Local or resident population have less stress and disease level as compared to the non-residents or hostelites. The locals have good dietary habits leading to better lifestyle.
62	Grahn P, Annerstedt M, Björk J, Östergren PO, Skärbäck E, Währborg P	2012	24945	Tranquil atmosphere is good for physical health but is not directly linked to improvement in mental health. It is good for both the genders, especially females.
63	Tek C, Grilo CM, Ratliff JC, Palmese LB, Reutenauer EL, Liskov E	2012	130	Poor dietary habits worsen schizophrenia while good nutrition and physical activity lessens its intensity.

Sr. No.	Name of Author	Year of Publishing	Sample Size	Results and findings
64	El Salhy M, Mazzawi T, Hausken T, Gundersen D	2013	46	Dietary guidelines improve lifestyle and reduce symptoms. It also improves their mineral and vitamin intake.
65	Cooper JA, Kozimor A, Chang H	2013	15	Liquids containing SFAs or PUFAs e satiate normal weight women more than liquids containing MUFAs.
66	Guler N, Ergin A, Tamay Z, Akcay A	2013	10,984	Antioxidant foods protect against allergic rhinitis but the Mediterranean diet does not t show any significant related effects.
67	del Consuelo Velázquez-Alva M , Lazarevich I, Irigoyen-Camacho ME	2013	1231	Students having poor eating habits showed high levels of depression and impulsivity.
68	Bajerska J, Łagowska K, Friebe Z, Kapczuk K	2014	45	Dietary intervention shows long-lasting enhancement in the nutritional status. It improves women athletes hormonal status and regulates their menstrual cycle.
69	Butterworth P, Jacka FN, Anstey KJ, Cherbuin N	2014	3663	Long term unhealthy dietary habits are linked to depression.
70	Gotsis E, Piscopo S, Tyrovolas S, Haro JM, Mariolis A, Tsakountakis N, Zeimbekis A, Valacchi G, Tyrovola D, Bountziouka V, Metallinos G.	2014	2663	Findings show that yearly use of healthcare services by the elderly was related to successful aging.
71	Powe NR, Crews DC, Kuczmarski MF, Miller III ER, Zonderman AB, Evans MK	2015	2058	Results show that urban poor's unhealthy diet was strongly linked to CKD.
72	Ismail I	2016	50	Results show that about 29.8% of the students consume fast food 2-3times per month due to its availability (55.3%).
73	Manjer J, Ohlsson B	2016	16840	Results show that physical activity reduces the risk of gastrointestinal complaints. Lunch skipping leads to diarrhea.

Sr. No.	Name of Author	Year of Publishing	Sample Size	Results and findings
				Skipping breakfast can cause bloating.
74	Kaczmarek E, Grygiel-Górniak B, Tomczak A, Przysławski J, Krulikowska N, Seraszek-Jaros A,	2016	151	Modified food habits help reduce the risk of obesity, osteoporosis or dyslipidemia.
75	Ebrahimi MH, Delvarianzadeh M, Saadat S	2016	1031	Findings show that most students were in normal BMI (73.91%). Some cases of malnutrition were also observed. Daily intake of different nutrients (vitamins and minerals) was below RDA.
76	Choi HG, Kim JH, Kim SY, Sim S, Park B, Kong IG	2016	359,264	Regular 3-time a day meals, and healthy diet were related to good school performance. However, the intake of unhealthy foods more than 7 times a week was related to poor school performance.
77	Kapsokefalou M, Husemann M, Malisova O, Athanasatou A, Pepa A, Domnik K, Braun H, Mora-Rodriguez R, Ortega JF, Fernandez-Elias VE,	2016	573, 39	20% of the participants were hyper hydrated or dehydrated, 40% had normal hydration status, 60% of participants were euhydrated.
78	Almajwal AM	2016	395	Results show nurses eating unhealthy food and less amount of vegetables and fruits were under stress. Night shift nurses were negatively linked to outdoor eating and positively linked to emotional and restrained eating.
79	Rasheed A,Khan M,	2016	146	Findings show that mostly students were overweight (15.8%), and 11.8% were obese.
80	Jabeen F, Aziz F, Ali MM,	2017	180	19.53% of girls were normal, 29.59% were overweight, 30.46% were obese, 17.77% (33) of them were under-weight.

Sr. No.	Name of Author	Year of Publishing	Sample Size	Results and findings
81	Gil J, Irazusta J, Fraile-Bermúdez AB, Kortajarena M, Zarrazquin I, Fernandez-Atutxa A, Ruiz-Litago F, Yanguas JJ	2017	65	Findings indicate that protein rich diet like nuts, dairy products and eggs and moderate physical activity lower the risk of CVD in elderly women.
82	Chen J, Zhang J, Zhang Y, Liu S, Jiang Y, Sun W, Zhu Q, Ip P, Zhang D, Chen C, Zhang L	2018	13001	Findings indicate male students' poor dietary habits and over 10-hour sleep, invite additional risks of childhood obesity. In contrast, the risk is lesser for students having healthy diet and >10-hour sleep.
83	Shah ZA, Khalid H, Khalid S,	2028	726	Results show students having healthy diet pattern and practices perform better in classroom.
84	Baig M, Mohib A, Rehman R, Zafar A	2018	813	Females were more conscious of their dietary pattern. The number of females who skip breakfast to lose weight was higher than of males. Happiness was more prevalent in males.
85	Olfert MD, Wattick RA, Hagedorn RL,	2018	1956	Results show that 36.7% of the participants were food insecure. The food security status and added sugar were linked to depression and anxiety.
86	Psarra G, Panagiotakos DB, Tambalis KD, Sidossis LS.	2018	177,091	Majority of the adolescents reported sleep disturbance due to unhealthy dietary patterns. Unhealthy dietary patterns increase the risk of becoming overweight and obese.
87	Jabbar M, Irfan M, Hameed S	2019	432	Findings show that students having good nutrition and regular exercise were normal BMI. 63.8% among them were underweight and 26% of the total participants never exercised.
88	Cohen AJ, Barry MR, Leung CW, Wolfson JA, Lahne J, Kasper N	2019	2000	Lower fruits intake was associated with low food security. Sugar-sweetened beverages were related to very low food security.

Discussion

The aim of this review was to determine the effects of dietary habits on the physical and mental health of individuals. Several controlled trials and case studies confirm that good health depends on good diet and physical activity. Findings show that overweight and obesity are linked to decreased physical activity which also lowers the quality of life and leads to poor mental health [29,32,33]. Proper physical activity, good dietary habits and low BMI all are inter-linked. They produce good academic results and better lifestyle, also boosting self-confidence [59]. The good performance of students depends on their eating pattern, regularly 3-time a day meals, and healthy diet. Whereas, taking unhealthy food more than 7 times a week negatively affect their school performance [87]. Another study suggests that poor dietary habits and over 10-hour sleep create e additional risk of childhood obesity for male students. On the contrary, students having healthy diet and >10-hoursleep have lower such risk [93]. Students with good nutrition and regular exercise had normal BMI. 63.8% among the participants were underweight and 26% of the total participants never did exercise [97].

Dietary habits are associated with many other diseases. Good diet helps fight diseases. Poor diet or meal skipping, especially breakfast, is closely associated with lesser self-confidence and even mood swings. Skipping lunch can cause diarrhea while skipping breakfast can generate bloating [84]. In early adolescence, the quality of breakfast is a significant constituent in the complex relation between mental health and daily life factors [53]. Food security status, added sugar and depression, anxiety are closely related [95].

Females were more conscious of their dietary pattern. The number of females skipping breakfast to lose weight was higher than of males. Males had more prevalence of happiness. Students having healthy dietary pattern and healthy practices performed better in classroom [12, 94]. Protein rich diet such as nuts, dairy products and eggs and moderate physical activity lower the risk of CVD in older women [92]. Irritable Bowel Syndrome is related to the fruits and vegetables intake.t.71 A research conducted on nurses shows that those nurses who were eating unhealthy food like least amount of vegetables and fruits were under stress. Night shift nurses were negatively linked to outdoor eating and positively linked to emotional and

restrained eating [89]. Modifying dietary habits also helps reduce the risk of developing obesity, osteoporosis & dyslipidemia [85]. Dietary changes show long-term improvement in the nutritional status of women athletes, their hormonal status and menstrual cycle [80].

Students with poor dietary habits showed high level of depression and impulsivity. Schizophrenia patients' condition worsens with poor dietary habits while good nutrition and being physically active lower their disease burden [76, 79]. Good dietary habits during pregnancy comprising fruits, vegetables, nuts, pulses, olive oil, dairy products and fish help fight against postpartum depressive symptoms [69]. Mediterranean diet has shown lots of benefits for both physical and mental health. A lot of studies show its positive impact and suggest that is should be promoted among individuals [48, 49].

In addition to good diet, environment also plays a major role in improving health. Dietary improvement was seen improving mental health over the sequel period, while poor diet was linked to poor emotional level. Local or resident population has less stress and disease level as compared to non-resident or hostelites. Locals have good dietary habits which ensures them a better lifestyle [68, 74]. The association between physical activities and fruits and vegetable intake is beneficial for the mentally ill [66].

There is a connection between adolescent depression and the quality of diet that depends on socio-economic status of every family. Poor diet increases the risk of adolescent depression [64, 65]. Dairy products do not much affect mental health but are beneficial for physical health.

Surprisingly, folic acid does not lower the mental health severity and is not associated with any symptoms [63]. While vitamins B complex and C supplements show positively affect individuals. Additional supplements taken by healthy people, lower stress and the severity of mental illness, also supporting cognitive behavior [57].

Recommendations for improved diet are mostly poorly understood by public. Even though people know most of the methods but are unable to follow them due to their busy daily routine or too much information. o A lot many blogs these days offer abundant information on health and the impact of food on it. But the real scientific studies on the subjects are weak

or mixed and in many cases, generating lot of debate among researchers. This establishes the expanding role of online tools in highlighting healthier food choices for people.

Conclusion

Dietary habits are closely linked with not only physical but also psychological health issues. Physical activity, diet, health and energy levels are all interlinked. For this reason, proper dietary guidelines and information regarding the quantity and quality of food to be consumed are necessary. The public health sector should start training students at school level, motivating them to eat three times a day, perform adequate physical activities and focus on consuming vegetables, fruits and whole-grains. It is recommended that information about specific healthy food, nutrients, and vitamins should be available online.

The number of researches on mental health with reference to the use of specific minerals or vitamins is limited. In this regard, most of the studies are observational. Hence, more case-control studies should be conducted. There is limited information available on the effects of specific nutrients on human health, which is why this shortcoming must be addressed.

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