食物防治抑郁症的研究现状及趋势分析

高 标[1,2]，蔡梦宇[1]，屈易萃[1]，张银银[1]，
卢宏涛[1]，李红霞[1]，汤雨潇[1]，沈 慧[*1]
（1. 海军军医大学 海军医学系，上海 200433；2. 海军军医大学 海军教研保障中心，上海 200433）

摘要：为了了解食物与抑郁症关系的研究现况，作者确定检索词优化后用于 Web of Science 数据库 Topic 检索。在线分析文献一般特征，CiteSpace 软件分析网络聚类共现特征，描述性分析关键文献。2020 年文献大幅增长；发表最多的期刊为食品类，国家为美国、英国、澳大利亚、加拿大和中国，学科以精神病学、营养与食品学为主。前沿关键词包括 food addiction、gut microbiota、food insecurity 等，不同引文聚类之间有此消彼长现象。抑郁症风险因素包括炎症饮食、进食障碍、超重、代谢综合征和 COVID-19 等，压倒性结论为健康饮食对抑郁症有正面影响。发达国家在本领域领先，创伤性大事件推动了研究进展。研究前沿为食物成瘾、食物不安全和肠菌。研究范式从狭窄视角向宏观转移，饮食有望成为重要的抑郁症干预措施。

关键词：食物；抑郁；现况；文本分析；计量分析；系统分析
中图分类号：R 155.1　**文章编号：**1673-1689(2022)08-0053-12　**DOI：**10.3969/j.issn. 1673-1689.2022.08.006

Research Status and Trend Analysis of Food Interventions for Depression

GAO Biao[1,2]，*CAI Mengyu*[1]，*QU Yicui*[1]，*ZHANG Yinyin*[1]，
LU Hongtao[1]，*LI Hongxia*[1]，*TANG Yuxiao*[1]，*SHEN Hui*[*1]
(1. Faculty of Naval Medcine, Naval Medical University, Shanghai 200433, China; 2. Teaching and Research Support Center, Naval Medical University, Shanghai 200433, China)

Abstract: To well understand the current research status on the relationship between food and depression, the authors determined the optimal search terms for Web of Science Database Topic retrieval. The general characteristics of literature was analyzed online, and the network clustering and co-occurrence analysis were conducted using CiteSpace software. A narrative review of key literature was carried out. The literature volume increased significantly in 2020. Most articles have been published in journals of food, and from the United States, the United Kingdom, Australia, Canada, and China with the disciplines of psychiatry, nutrition, and food science. Frontier keywords include food addiction, gut microbiota, food insecurity, etc., showing a phenomenon of 'ebb and flow' against

收稿日期：2022-05-06
基金项目：国家自然科学基金项目(81573150)；军队重点学科建设项目(HL21JD1206)。
作者简介：高 标(1972—)，男，博士研究生，编审，主要从事医学情报分析、营养与食品卫生方面的研究。E-mail：gbdata@163.com
*** 通信作者：**沈 慧(1977—)，男，博士，教授，博士研究生导师，主要从事营养与食品卫生学方面的研究。E-mail：shenhuicn@126.com

the different citation clusters. Factors contributing to depression include dietary inflammation, eating disorders, overweight, metabolic syndrome and COVID-19. The overwhelming conclusion is that healthy eating patterns have a positive effect on depression. Developed countries are leading the research, and major traumatic events are promoting research progress. The research frontiers include food addiction, food insecurity, and gut bacteria. The research paradigm has shifted from narrow perspectives to macroscopic view, and diet is expected to become an important intervention for depression.

Keywords: food, depression, status quo, text analysis, bibliometric analyses, systematic reviews

作为常见病，抑郁症既是重要的健康问题，也是当前重大的社会和经济问题[1-2]，疾病负担重[3-5]，发病率上升，尤其是在全球性[6]或重大创伤性事件(COVID-19[7-9])后增长更为明显。食物与抑郁的关系密切，不良饮食[10]、深加工食物[11]都是抑郁症的风险因素，改善饮食则能从中受益[12-13]，其中地中海式饮食为代表[14-15]；此外，心理疾病患者常有营养问题，包括肥胖[16]和代谢综合征[17]等。患者体内高水平炎症因子与肥胖营养素、炎症饮食相关[18]，队列研究证明了此风险因素[19]。

抑郁症的干预需要多种方法和多学科介入，其中饮食因其依从性和效率[20]优势而前景乐观[13]，机制涉及调节炎症和抗氧化应激[16]、肠-脑轴途径[21-22]、表观遗传修饰[3-4]、神经递质及神经可塑性[23-26]。饮食干预的证据仍存在着异质性，关联的方向性也有待进一步阐明，多数报道都建议用可能的方法进行深入研究。近年来，从海量数据中提取有效信息，分析关联、聚类、趋势、焦点、前沿和特异性等，对于科学研究具有独特的价值和策略性意义[27]。

1 材料与方法

1.1 数据库和工具

2022 年 3 月，在医学主题词（Medical Subject Headings，MeSH）数据库查询 MeSH 后，用 Web of Science(WoS)核心合集数据库(SCIE，2007 至今)检索文献进行分析。使用 CiteSpace(version 5.8.R4)、NoteExpress(version 3.5.0.9054)进行数据管理和分析，WoS 数据库在线平台和专业绘图工具辅助分析。

1.2 数据分析

仅对非图书类的英语文献分析。先对 WoS 数据库在线平台提供出版时间、学科、期刊来源、国家/地区进行一般分析，下载分析结果，绘图工具绘制更直观的可视图。对检索获得的文献数据导入 CiteSpace 进行初步分析，查看关键词，合并同义词、异写词后进行网络共现聚类分析，包括关键词、引文、被引作者的共现、聚类、时间线、时间域、突现分析。

2 结果与分析

2.1 检索结果

在 MeSH 库中查询 food，得到 101 个 MeSH，筛选适合检索目标文献的 45 个，用通配符“*”优化为 15 个，用“OR”逻辑运算在 WoS 数据库检索 Topic，得到 1 593 593 个结果。查询 depression 得到 23 个 MeSH，筛检出 10 个，用“OR”逻辑运算在 WoS 数据库检索 Topic，得到 366 783 个结果。上述结果进行“AND”运算得到 17 665 个结果，去除非英语文献得到 17 210 个结果，去除图书得到 17 025 个结果，见图 1。

2.2 文献一般特征

WoS 数据库提供在线分析 19 种文献特征和 2 种可视化结果输出，选取出版时间、学科、期刊来源、国家/地区的数据导入 EXCEL 处理，借助绘图工具分析，以可视化方式呈现结果并阐释。

总体上文献数量平稳增长，2020 年（21.0%）较 2019 年(13.2%)有大幅度增长，见图 2(a)。这可能与 COVID-19 疫情影响相关，重大疫情促使抑郁症发病率大幅度增长[9,28]，间接推动了相关研究的进展。

期刊分布为 *Int J Eat Disord*（444 篇）、*PLOS ONE*（368 篇）、*J Affect Disord*（325 篇）、*Nutrients*（324 篇）、*Eat Weight Disord*（302 篇）、*Appetite*(217 篇)等，见图 2(b)。学科分布为 Psychiatry(4 324 篇)、Nutrition Dietetics（2 643 篇）、Neurosciences

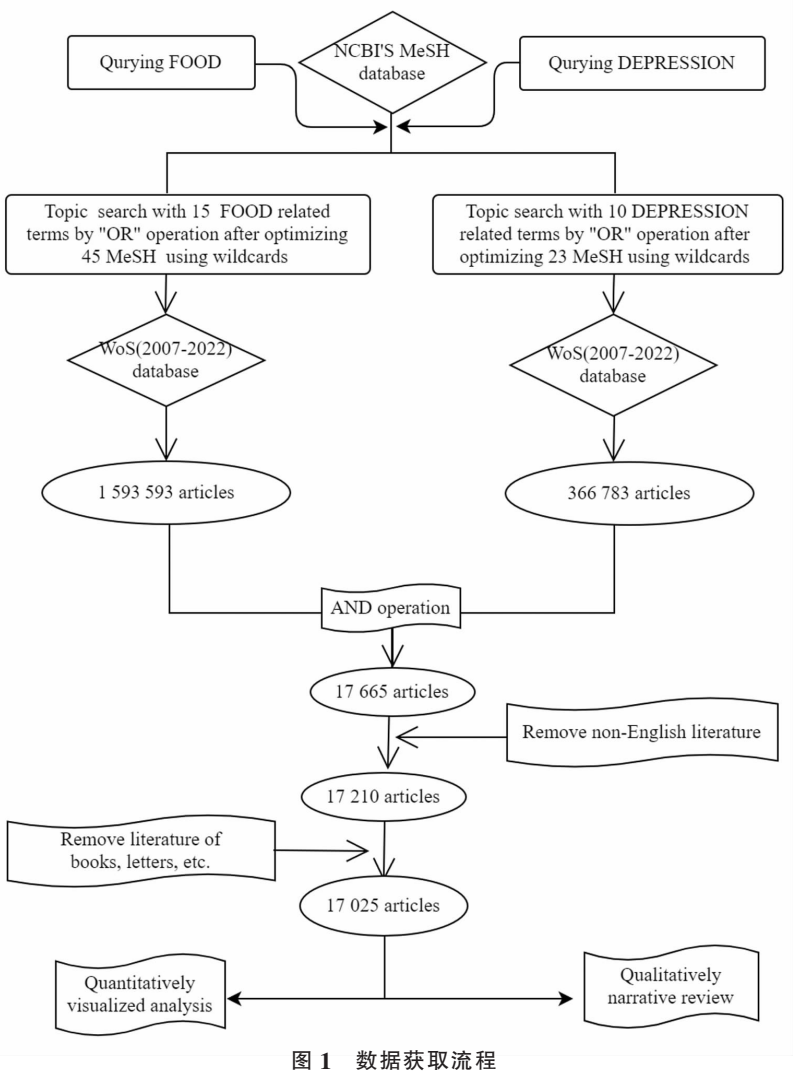


图 1　数据获取流程

Fig. 1　Data acquisition flow chart

(2 056 篇)、Public Environmental Occupational Health (1 302 篇)、Pharmacology Pharmacy(1 281 篇)、Clinical Neurology(1 193 篇)等，见图 2(c)。此分布表明本领域的研究为食物、精神疾病、营养和公共卫生的交叉领域，防治抑郁症需要多学科介入。当前精神疾病研究前沿包括了多个临床专业[29](营养、内分泌、胃肠病等)以及多生物学途径(炎症、应激、肠菌、遗传修饰和神经可塑)基础研究的协作[4]。

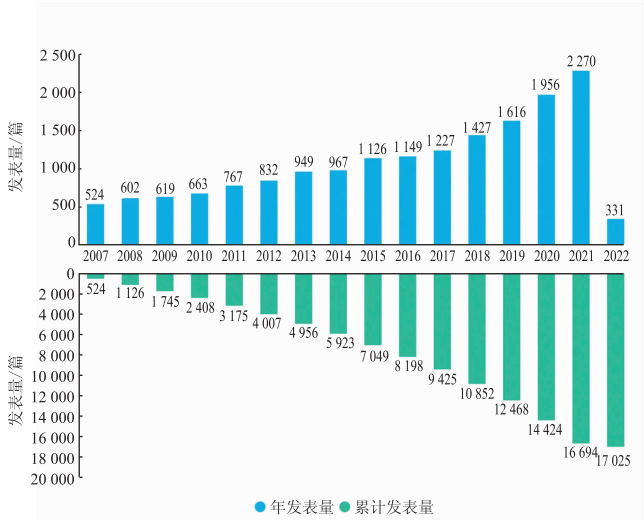
学术机构：Harvard University (682 篇)、University of London (613 篇)、University of California System (574 篇)、Kings College London (353 篇)、INSERM (337 篇)、University of Toronto (331 篇)、PCSHE (322 篇)、University of North Carolina(315 篇)等，见图 2(d)。

国家/地区分布：USA (6 394 篇)、UK (1 757 篇)、AUSTRALIA(1 209 篇)、CANADA(1 196 篇)、PEOPLES R CHINA(1 141 篇)等，见图 2(e)。分布表明本领域的研究以(准)发达国家为主，既反映了研究能力和学术水平，也表明了经济基础和现实的社会需求，如肥胖、抑郁在发达国家有较高的患病率。

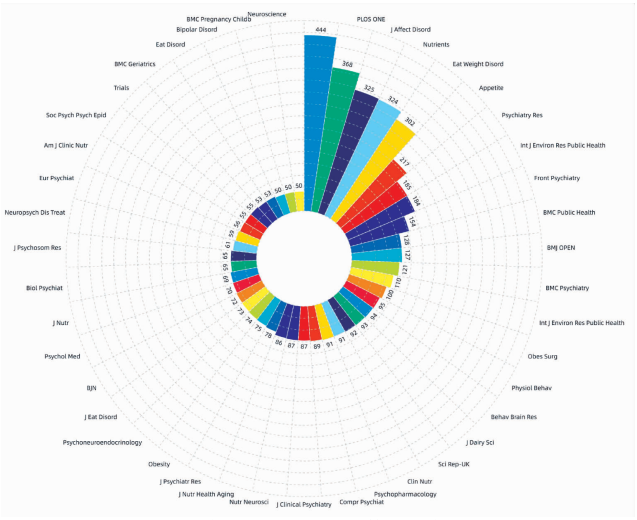
2.3　聚类网络共现分析

检索结果导入 CiteSpace 进行试分析，查看关键词，合并 48 对同义异写词后进行正式运算分析。

2.3.1　关键词分析　突现分析得到的前沿、高强度、长时间关键词分别代表了当前焦点、(曾经或现在)热点和长期影响力，见图 3(a)。前沿关键词包括食物成瘾 (food addiction，FA)、肠道菌群(gut microbiota)、食物不安全(food insecurity，FI)和系统评价(systematic review)等，表明对食物成瘾和食物不安全影响精神健康的关注度高，随着基因组学、



(a) 年发表量与累计发表量



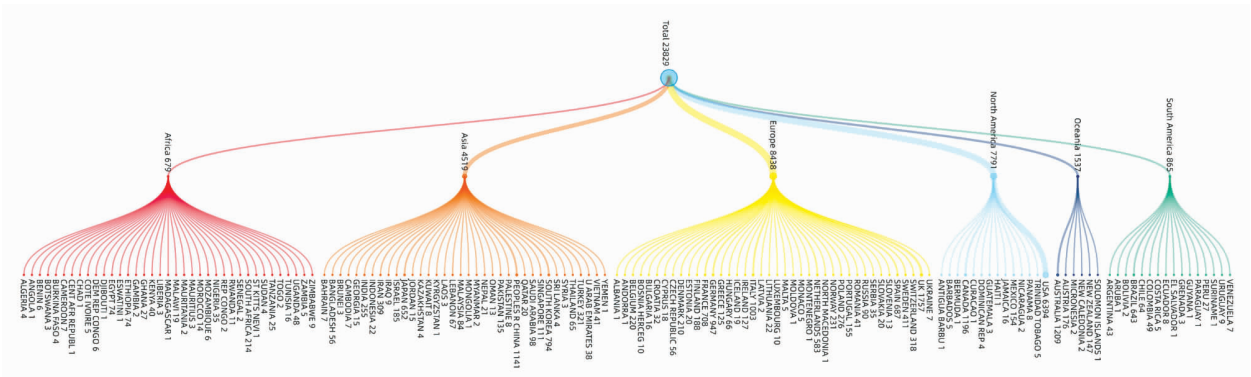
(b) 主要期刊分布（50篇以下未计）



(c) 学科分类所占比例



(d) 主要的研究机构分布

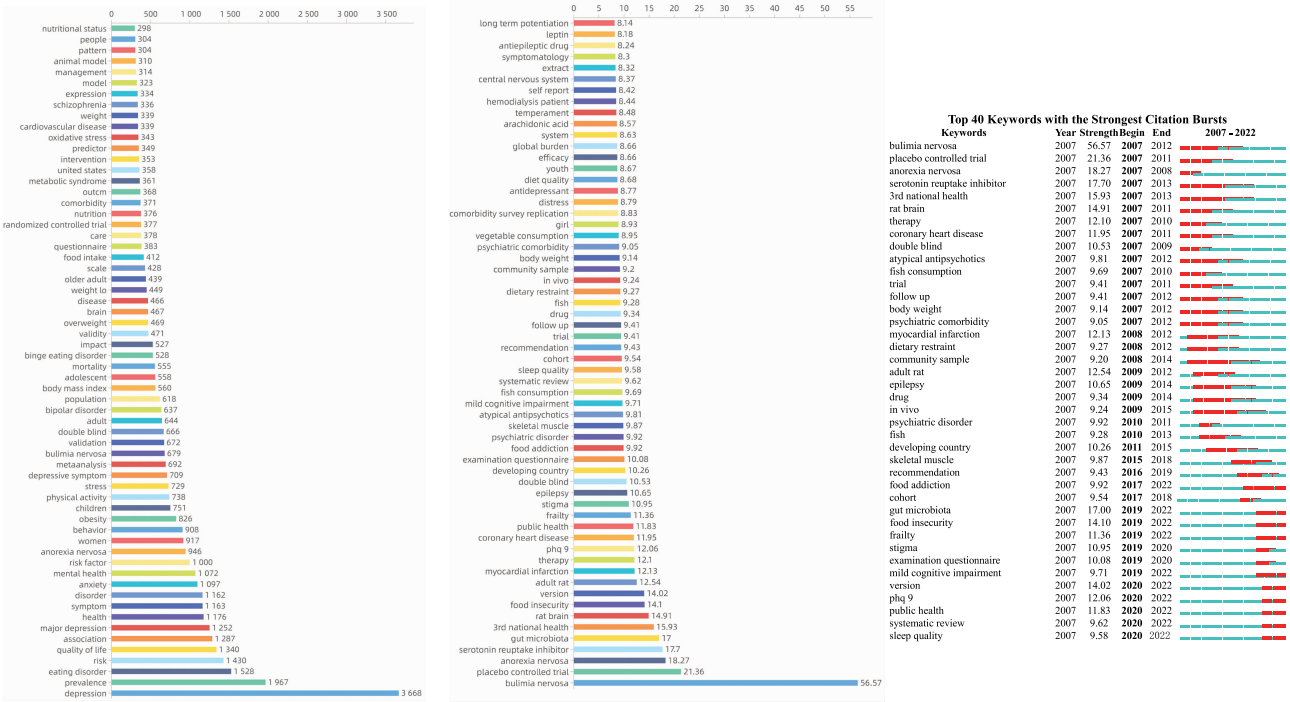


(e) 国家/地区分布（部分文章的作者来自一个以上的国家）

图 2　文献一般特征

Fig. 2　General characteristics of literature

代谢组学的快速进展，人们对肠菌对认识障碍的影响得到了极大提升，系统分析仍受到重视。高强度词包括神经性贪食（bulimia nervosa，BN）、神经性厌食（anorexia nervosa，AN）、5-羟色胺重抑制剂（serotonin reuptake inhibitor）、gut microbiota、FI、FA 等，见图 3（b）。长时长词包括：serotonin reuptake inhibitor、BN、FA、非典型抗精神病药物（atypical antipsychotics）等，见图 3（c）。



（a）关键词词频　　（b）关键词中心值　　（c）关键词突现分析

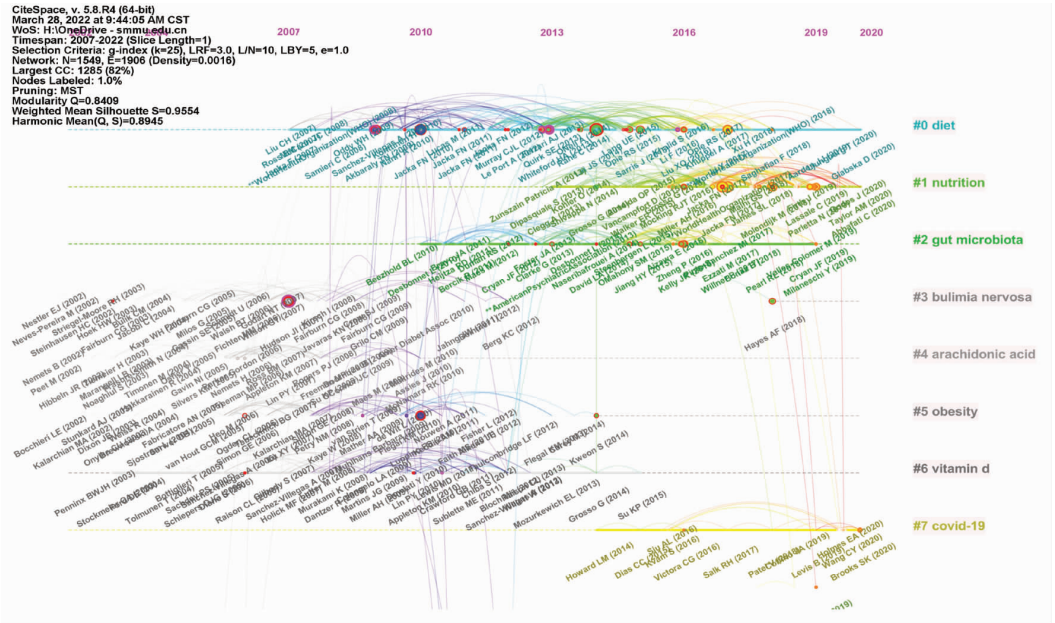
图 3　关键词分析

Fig. 3　Analysis of keywords

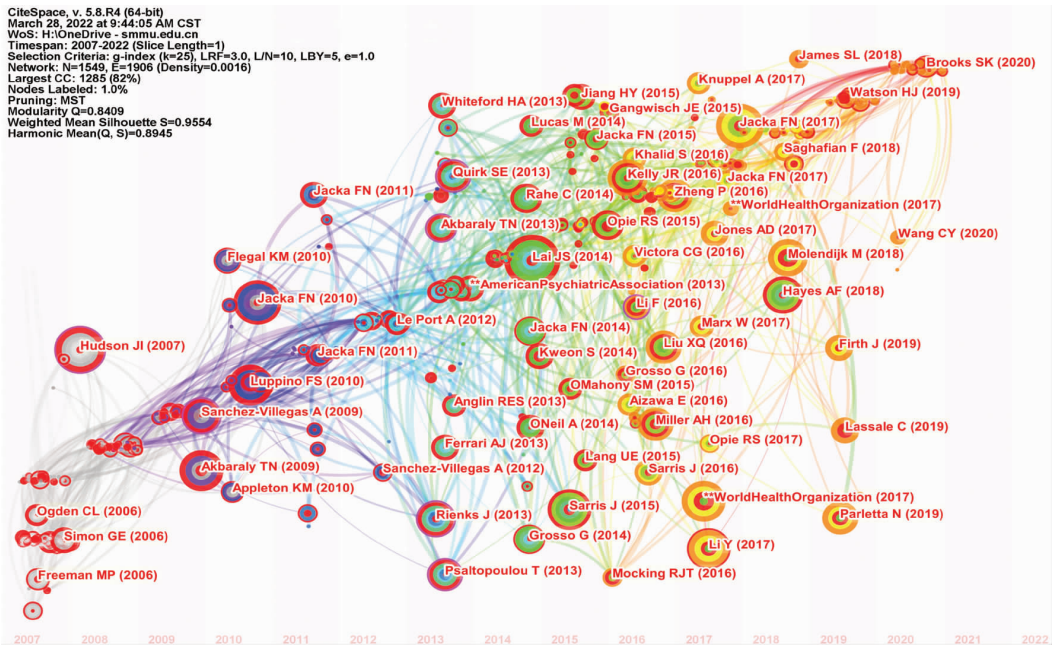
2.3.2　引文分析　引文聚类时间线上明显的此消彼长的“接力”现象暗示该领域的研究发生了范式转移。前 3 大聚类 diet（2007 始）、nutrition（2013 始）、gut microbiota（2010 始）和第 8 聚类 COVID-19（2015 始），远较其他聚类活跃，且都持续到了现在，其他聚类相应地变弱、变冷，见图 4（a）。引文时间域 2014 年后出现的高频引文十分活跃，其中的一些突现成了前沿引文，见图 4（b）。本领域的研究由原来狭窄视角（饮食障碍、维生素、肥胖或脂肪酸对抑郁的影响）转向了较为宏观的视野，如膳食模式、食品安全、食物成瘾、肠菌和新冠疫情等。图 5（a）中引文突现的 10 篇前沿引文中有 6 篇明确高质量膳食模式可改善精神疾病，FI 致精神障碍和食品供应影响隔离心理的研究各 1 篇。

高强度引文包括：APA（2013）的 DSM（第五版）；Luppino（2010）[30]系统评价证实肥胖增加抑郁症风险；Hudson（2007）[31]饮食失调与精神障碍相关；Lai（2014）[32]、Li（2017）[10]、Jacka（2017）[33]和 Sánchez-Villegas（2009）[15]认为健康饮食（或改善饮食，或地中海饮食）与抑郁症负相关；Jacka（2010）[34]和 Akbaraly（2009）[11]认为（低）饮食质量（或深加工食品）与抑郁症（或精神障碍）风险相关；Molendijk（2018）[35]则有不同的结论，认为饮食质量和抑郁症的关联不强；Brooks（2020）[36]认为疫情隔离不应超过必要时长，确保（食品）供应，充分告知，能减少心理影响；WHO（2017）[37]进行了抑郁症和其他精神障碍全球健康评估，见图 5（a）。

前沿引文包括：高强度引文中 Jacka（2017）[33]、Molendijk（2018）[35]、Li（2017）[10]、WHO（2017）[37]、Brooks（2020）[36]等的研究；Parletta（2019）[38]和 Lassale（2018）[14]认为地中海饮食能改善抑郁；Firth（2019）[13]认为饮食有望成为改善抑郁的新措施；Jones（2017）[39]认为 FI 可致心理问题；James（2018）[5]2017 年全球疾病负担分析，抑郁症和腰痛、头痛是主要问题，见图 5（a）。



(a) 引文聚类时间线



(b) 引文时间域

图 4　引文的时间特征分析

Fig. 4　Analysis of citation time characteristics

2.3.3　引文作者分析　在分析中突现强度高的引文作者是该领域内有较高影响力的“专家”,如 DSM(第五版)的“作者”APA 和发布纲领性文件的 WHO。其他作者研究概述:健康/高质量/改善的饮食对抑郁症有正面影响[13-14,19,40],西式饮食则相反[10]。炎症饮食与严重精神疾病密切相关[18],重症抑郁倾向于进食过多和低质量饮食[20],剖析进食障碍的精神病理学[41],应予以重视[42];NOS 在 DSM-IV 中存在的问题[43-44]。饮食失调可从认知行为疗法获益[45],但有精神病理表现的则需更复杂的治疗[46],诊断依赖怀疑量表得分[47]。神经性厌食症(AN)危险因素包括体重指数、遗传[48]和家族焦虑表型[49],恐惧为其病理机制[50]。目前能有效治疗 AN 的证据不够[51],患抑郁症而自杀的 AN 因分型不同而差异较大[52],

氟西汀对 AN 无效[53]。暴食症以冲动或情感不稳定为特征[54]。有人认为饮食和抑郁症的关联性不强[35]，他还曾称强迫游泳测试并不能反映抑郁[55]。有人认为 EPA 治疗双相抑郁及情感障碍无效[56]，但更多的专家认为脂肪酸对情绪有影响[57]，ω3 能降低抑郁风险[58]。美国成年人肥胖率在 1999–2014 年持续上升[59–61]，COVID–19 初期对心理健康影响大[9,28]，见图 5(b)。

引文前沿作者：Lopresti[62]分析 MDD 生活因素后认为应进行有效干预。肥胖和精神疾病有相同生物学失调途径，减肥能改善心理健康[16]。Vancampfort 认为药物治疗 MDD 增加了 MetS 风险 [17]，2 型糖尿病对 MDD 有特别危害[63]。MARX 给出营养精神病学的全景概述[3–4]，认为饮食有望成为有前景的干预措施[13]。Parletta[38]、Firth[13,18]、Rodgers[64]、Li[10]、Wang[9,28]、Brooks[36]、Molendijk[35]、Lassale[14]、Jones[39]的研究在前文高强度突现作者中已述，见图 5(b)。

2.4　综合分析

2.4.1　*食物成瘾、饮食失调和肥胖*　FA 既是研究前沿也是长时间和高强度突现词，关键词聚类时归入 eating disorder 聚类，引文聚类时是独立聚类。与其相近，神经性贪食(BN)也是高强度突现词、长时间突现词，也是高频词和最高中心值词。

FA 指享乐性饮食，摄入超出需求的垃圾食品(由工业膳食能量和营养素以及添加剂组成的高盐、高脂肪和高糖食物)[65–66]。食物成瘾和药物成瘾在生物行为学上相似[65]，常见于发达国家[67]，在中国青少年[68-69]中也很常见，是低生活质量的体现[67-68]。对特定食物“上瘾”并不一定是 FA，用食物成瘾量表诊断时要考虑“对食物的渴望”和“抑郁症状严重程度”[70]，心理社会功能降低[71]是 FA 的一个重要特征，中文版食物成瘾量表(2.0)的研究也发现，FA 与社会支持度负相关[69]。区分 FA 和饮食限制有利于临床实践[72]。丹麦的全国性调查发现，FA 在患有精神障碍的青少年中普遍存在[73]。

美国成年人肥胖率在 1999–2014 年持续增长[59-61]，成为公共卫生主要问题 [74]，肥胖又与情绪障碍、焦虑、进食障碍有着复杂的关联[67,75–76]，与酒精依赖存在相似的神经生物学特征和共同的神经生理基础[77]。高强度突现引文确认肥胖能增加患抑郁风险[30]，如同肥胖、炎症状态和胰岛素抵抗与心血管疾病的风险紧密相关一样，饮食模式与抑郁症也密切相关[78]。

不仅 2 型糖尿病中 FA 的抑郁症状比例较高[79]，抑郁症患者也更容易患上糖尿病[80]。内分泌失调和过量饮食为选择干预措施提供了有用信息[81]。

Top 40 References with the Strongest Citation Bursts

References	Year	Strength	Begin	End	2007 - 2022
Hudson JI, 2007, BIOL PSYCHIAT, V61, P348	2007	39.16	2007	2012	
Kessler RC, 2005, ARCH GEN PSYCHIAT, V62, P593	2005	17.91	2007	2010	
Ogden CL, 2006, JAMA-J AM MED ASSOC, V295, P1549	2006	17.59	2007	2011	
Kaye WH, 2004, AM J PSYCHIAT, V161, P2215	2004	14.48	2007	2009	
Simon GE, 2006, ARCH GEN PSYCHIAT, V63, P824	2006	18.83	2008	2011	
Freeman MP, 2006, J CLIN PSYCHIAT, V67, P1954	2006	16.13	2008	2011	
Raison CL, 2006, TRENDS IMMUNOL, V27, P24	2006	14.51	2008	2011	
Sanchez-Villegas A, 2009, ARCH GEN PSYCHIAT, V66, P1090,	2009	29.64	2010	2014	
Jacka FN, 2010, AM J PSYCHIAT, V167, P305	2010	35.92	2011	2015	
Akbaraly TN, 2009, BRIT J PSYCHIAT, V195, P408	2009	32.43	2011	2014	
Flegal KM, 2010, JAMA-J AM MED ASSOC, V303, P235	2010	17.23	2011	2015	
Appleton KM, 2010, AM J CLIN NUTR, V91, P757	2010	15.45	2011	2015	
Luppino FS, 2010, ARCH GEN PSYCHIAT, V67, P220	2010	43.51	2012	2015	
Swanson SA, 2011, ARCH GEN PSYCHIAT, V68, P714	2011	21.01	2012	2016	
Jacka FN, 2011, PSYCHOSOM MED, V73, P483	2011	17.31	2013	2016	
APA, 2013, DIAGNOSTIC STAT MANU, V5th ed, P0	2013	101.63	2014	2018	
Kessler RC, 2013, BIOL PSYCHIAT, V73, P904	2013	18.26	2014	2018	
Arcelus J, 2011, ARCH GEN PSYCHIAT, V68, P724	2011	16.61	2014	2016	
Quirk SE, 2013, BMC PSYCHIATRY, V13, P0	2013	15.88	2014	2018	
Rienks J, 2013, EUR J CLIN NUTR, V67, P75	2013	15.54	2014	2018	
Psaltopoulou T, 2013, ANN NEUROL, V74, P580	2013	15.20	2014	2018	
Lai JS, 2014, AM J CLIN NUTR, V99, P181	2014	36.02	2015	2019	
Whiteford HA, 2013, LANCET, V382, P1575	2013	20.95	2015	2018	
APA, 2013, DIAGN STAT MAN MENT, V5th ed, P0	2013	18.57	2015	2018	
Ferrari AJ, 2013, PLOS MED, V10, P0	2013	18.57	2015	2018	
Grosso G, 2014, PLOS ONE, V9, P0	2014	14.44	2015	2019	
Sarris J, 2015, LANCET PSYCHIAT, V2, P271	2015	16.04	2016	2020	
ONeil A, 2014, AM J PUBLIC HEALTH, V104, P0	2014	15.61	2016	2019	
Kweon S, 2014, INT J EPIDEMIOL, V43, P69	2014	15.97	2017	2019	
Jiang HY, 2015, BRAIN BEHAV IMMUN, V48, P186	2015	15.69	2017	2020	
Jacka FN, 2017, BMC MED, V15, P0	2017	24.23	2018	2022	
Molendijk M, 2018, J AFFECT DISORDERS, V226, P346	2018	25.06	2019	2022	
Li Y, 2017, PSYCHIAT RES, V253, P373	2017	24.62	2019	2022	
WHO, 2017, WHO DEPR OTH COMM ME, V0, P0	2017	22.25	2019	2022	
Parletta N, 2019, NUTR NEUROSCI, V22, P474	2019	18.40	2019	2022	
Firth J, 2019, PSYCHOSOM MED, V81, P265	2019	17.35	2019	2022	
Jones AD, 2017, AM J PREV MED, V53, P264	2017	14.56	2019	2022	
Brooks SK, 2020, LANCET, V395, P912	2020	26.27	2020	2022	
Lassale C, 2019, MOL PSYCHIATR, V24, P965	2019	22.12	2020	2022	
James SL, 2018, LANCET, V392, P1789	2018	16.95	2020	2022	

(a) 引文突现分析

Top 40 Cited Authors with the Strongest Citation Bursts

Cited Authors	Year	Strength	Begin	End	2007 - 2022
FAIRBURN CHRISTOPHER G	2007	36.07	2007	2014	
WHO	2007	32.21	2007	2011	
BULIK CM	2007	30.86	2007	2012	
FIRST MB	2007	28.44	2007	2014	
STROBER M	2007	27.70	2007	2012	
KECK PE	2007	24.95	2007	2013	
HSU LKG	2007	24.93	2007	2011	
STEIGER H	2007	24.60	2007	2012	
TIEMEIER H	2007	24.58	2007	2011	
KENDLER KS	2007	23.78	2007	2011	
TANSKANEN A	2007	23.36	2007	2011	
TELCH CF	2007	21.76	2007	2012	
GUY W	2007	21.29	2007	2012	
GIBBONS RD	2007	20.95	2007	2012	
STOLL AL	2007	20.77	2007	2010	
MANN JJ	2007	20.21	2007	2010	
STRIEGEL-MOORE RH	2007	19.60	2007	2012	
WONDERLICH SA	2007	19.50	2007	2012	
SULLIVAN PF	2007	18.87	2007	2014	
HERZOG DB	2007	18.83	2007	2012	
FREEMAN MP	2007	21.97	2008	2012	
FAVARO A	2007	20.05	2009	2015	
ZIMMERMAN M	2007	19.25	2010	2015	
FLEGAL KM	2007	23.50	2011	2015	
APA	2007	41.68	2014	2019	
DINAN TG	2007	19.99	2017	2020	
LOPRESTI AL	2007	20.99	2018	2022	
PARLETTA N	2007	19.98	2018	2022	
VANCAMPFORT D	2007	18.73	2018	2022	
FIRTH J	2007	36.98	2019	2022	
LASSALE C	2007	26.03	2019	2022	
MOLENDIJK M	2007	23.96	2019	2022	
JONES AD	2007	20.09	2019	2022	
MARX W	2007	19.43	2019	2022	
WANG J	2007	19.31	2019	2022	
MOHER D	2007	18.75	2019	2020	
BROOKS SK	2007	31.79	2020	2022	
WANG CY	2007	22.21	2020	2022	
LI Y	2007	22.16	2020	2022	
RODGERS RF	2007	18.98	2020	2022	

(b) 引文作者突现分析

图 5　引文突现和引文作者突现分析

Fig. 5　Anylisis of citations burst and citation author burst

MDD 的饮食失调发生率高,与食欲激素相关[82]。减肥手术者 FA 患病率高[66],术后抑郁症状加重[83]。

食物成瘾量表 2.0 表明 FA 可作为神经性厌食症(AN)严重程度指标[84]。计量分析中 AN 是高强度突现词也是高频词,是一种具有显著发病率和死亡率的严重精神疾病。

营养失衡和肥胖是抑郁症风险因素[80],涉及进食障碍和 MetS 等问题。进食障碍在文本分析中为检索词以外的最高频词,50 年来患病率一直在增加,诊疗存在着不确定性[85]。其 3 种类型可相互转换且与精神障碍有关,易被忽视[31],由于 2003 年*Lancet*的呼吁才被关注[42]。该病病因复杂,有遗传因素,也涉及环境。认知行为疗法最为有效,但在临床上很少被接受。其下位词 BN、AN 是曾经的研究热点,而且 BN 还是最高强度突现词。

2.4.2 膳食模式 营养素对抑郁的积极作用有大量的支持性文献,膳食模式的选择则是切实的临床实践。定量分析中,第 1 引文聚类标签为 diet,第 6 为 dietary pattern, 此两聚类自 2007 年至今一直保持活跃。前 10 篇高强度引文中 7 篇[10-11,15,32-35]和前 10 篇前沿引文中 6 篇[10,13-14,33,35,38]共 10 篇专门阐述膳食模式和/或饮食质量干预抑郁类精神疾病的研究。其中,9 项研究认为健康或高质量饮食是保护性干预措施, 包括 5 项地中海/健康饮食与抑郁负相关,2 项改善饮食可作为治疗新策略;仅 1 项认为当前证据不充分。10 篇报道中系统分析 5 项,RCT 2 项,前瞻性队列 2 项,横断问卷调查 1 项。整体上,健康饮食模式对抑郁症的改善有益[21]。

基于传统地中海饮食的改良[14-15],辅以鱼油[38]或其他补充剂[86],或者与现代深加工食品相反的整体食物模式(whole food pattern)[11]、生酮饮食[87]和健康饮食[13-14,32-33,88],提供丰富的多酚[3]和多不饱和脂肪酸[40]、维生素抗氧化应激和炎症、胆碱和必需氨基酸产生神经递质(血清素、多巴胺、GABA 等)等,这些物质参与调节情绪和认知,降低抑郁焦虑压力量表的评分。最为重要的是营养补充具有良好的安全性[40],将依从性高、可及性好的食物作为干预措施,无疑要比有效率低、副作用严重的药物治疗更有前景,应采取积极态度[87-88]。

2.4.3 肠菌 肠菌既是研究前沿,也是高强度突现词,还是第 3 引文聚类的标签,近年来热度很高。被认为与免疫炎症、氧化应激、表观遗传修饰和神经可塑性等精神健康密切相关机制并列[4],虽然兴起较晚,但得益于基因组学、代谢组学而进展迅速。它对 CNS 有重大影响,主要为食物消化、转化产生的大量重要底物[89],脑-肠轴假说是其系统的理论[88]。该理论涉及多途径双向传递信号[80],如炎症因子、神经因子、SCFAs、迷走神经和神经递质(多巴胺、血清素、GABA)[23-25],受肠菌影响作用于机体产生以异常行为表现的精神疾病[80]。

抑郁症的肠菌丰度和多样性均降低,但不同的研究差异性大,因果方向界定困难[90-91]。然而接受患者的肠菌移植致使实验动物发生抑郁症样行为,为因果界定提供了有力证据[24]。猜想可能存在饮食诱导的促抑郁的肠菌,代谢物分析或者可以揭示[92]。益生菌能恢复失衡的肠菌,改善抑郁和其他精神症状[89,93]。干酪乳杆菌可经 BDNF-ERK1/2 通路调节,改变肠菌群、单胺类物质和氧化应激来改善抑郁[94]。传统的有益植物化学物多酚,能双向调节肠菌组和基因表达[3],补充益生菌或特定食物来干预抑郁症是未来有希望的新选择[21-22]。

3 结 语

作者借助新型的数据分析工具 CiteSpace 作为主要的研究手段对经过严格筛选的 17 025 篇食物和抑郁相关的 SCIE 文献进行了多维度分析, 分析了该领域的研究现况和深层次特征, 如研究焦点、研究前沿、要素联系、研究的演变发展趋势。主要发现包括:COVID-19 不但影响了抑郁的发病率,也间接推动了相关研究的进展。发达国家因其经济基础强大决定了研究水平领先,也因伴生的健康问题如低质量饮食,肥胖和抑郁症高发而催生了迫切的心理健康需求。本领域的研究是依靠精神病学、神经科学、食品科学和营养学为主的众多学科相互协作共同推进的。另外,该领域研究的范式发生了转移,从之前关注某一病症如神经性贪食、肥胖或某一营养素(维生素 D、不饱和脂肪酸等)转向为饮食模式、营养、肠菌和 COVID-19 等更为宏观的视角来研究食物与抑郁的关系,前沿关键词食物成瘾、肠菌、食物不安全、系统分析也体现了这一趋势。

目标文献集群中压倒性结论为高质量饮食对抑郁证有正向影响,未来食物选择和饮食模式选择有望成为干预抑郁症的重要措施。

参考文献:

[1] DOMÈNECH-ABELLA J,MUNDÓ J,LEONARDI M,et al. The association between socioeconomic status and depression among older adults in Finland,Poland and Spain:a comparative cross-sectional study of distinct measures and pathways[J]. **Journal of Affective Disorders**,2018,241:311-318.

[2] FREEMAN A,TYROVOLAS S,KOYANAGI A,et al. The role of socio-economic status in depression:results from the COURAGE(aging survey in Europe)[J]. **BMC Public Health**,2016,16(1):1098.

[3] MORRIS G,GAMAGE E,TRAVICA N,et al. Polyphenols as adjunctive treatments in psychiatric and neurodegenerative disorders: Efficacy,mechanisms of action,and factors influencing inter-individual response[J]. **Free Radical Biology and Medicine**,2021,172:101-122.

[4] MARX W,MOSELEY G,BERK M,et al. Nutritional psychiatry:the present state of the evidence [J]. **Proceedings of the Nutrition Society**,2017,76(4):427-436.

[5] JAMES S L, ABATE D, ABATE K H, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990-2017: a systematic analysis for the global burden of disease study 2017[J]. **Lancet**, 2018, 392(10159): 1789-1858.

[6] WEILNHAMMER V,SCHMID J,MITTERMEIER I,et al. Extreme weather events in Europe and their health consequences - a systematic review[J]. **International Journal of Hygiene and Environmental Health**,2021,233:113688.

[7] SANTOMAURO D F,HERRERA A M M,SHADID J,et al. Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic[J]. **Lancet**,2021,398(10312):1700-1712.

[8] ETTMAN C K,ABDALLA S M,COHEN G H,et al. Prevalence of depression symptoms in US adults before and during the COVID-19 pandemic[J]. **JAMA Network Open**,2020,3(9):e2019686.

[9] WANG C,PAN R,WAN X,et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease(COVID-19) epidemic among the general population in China[J]. **International Journal of Environmental Research and Public Health**,2020,17(5):1729-1754.

[10] LI Y,LV M R,WEI Y J,et al. Dietary patterns and depression risk:a meta-analysis[J]. **Psychiatry Research**,2017,253:373-382.

[11] AKBARALY T N,BRUNNER E J,FERRIE J E,et al. Dietary pattern and depressive symptoms in middle age [J]. **British Journal of Psychiatry**,2009,195(5):408-413.

[12] ZHAO H,ANDREYEVA T. Diet quality and health in older Americans[J]. **Nutrients**,2022,14(6):1198.

[13] FIRTH J,MARX W,DASH S,et al. The effects of dietary improvement on symptoms of depression and anxiety:a Meta-Analysis of randomized controlled trials[J]. **Psychosomatic Medicine**,2019,81(3):265-280.

[14] LASSALE C,BATTY G D,BAGHDADLI A,et al. Healthy dietary indices and risk of depressive outcomes:a systematic review and meta-analysis of observational studies[J]. **Molecular Psychiatry**,2019,24(7):965-986.

[15] SÁNCHEZ-VILLEGAS A,DELGADO-RODRÍGUEZ M,ALONSO A,et al. Association of the mediterranean dietary pattern with the incidence of depression:the seguimiento universidad de navarra/university of navarra follow-up (SUN) cohort[J]. **Archives of General Psychiatry**,2009,66(10):1090-1098.

[16] LOPRESTI A L,DRUMMOND P D. Obesity and psychiatric disorders:commonalities in dysregulated biological pathways and their implications for treatment[J]. **Progress in Neuro–Psychopharmacology & Biological Psychiatry**,2013,45:92-99.

[17] VANCAMPFORT D,STUBBS B,MITCHELL A J,et al. Risk of metabolic syndrome and its components in people with schizophrenia and related psychotic disorders,bipolar disorder and major depressive disorder:a systematic review and meta-analysis[J]. **World Psychiatry**,2015,14(3):339-347.

[18] FIRTH J,STUBBS B,TEASDALE S B,et al. Diet as a hot topic in psychiatry:a population-scale study of nutritional intake and inflammatory potential in severe mental illness[J]. **World Psychiatry**,2018,17(3):365-367.

[19] FIRTH J,VERONESE N,COTTER J,et al. What is the role of dietary inflammation in severe mental illness? a review of observational and experimental findings[J]. **Frontiers in Psychiatry**,2019,10:350-359.

[20] FIRTH J,SIDDIQI N,KOYANAGI A,et al. The lancet psychiatry commission:a blueprint for protecting physical health in people with mental illness[J]. **Lancet Psychiatry**,2019,6(8):675-712.

[21] KRIS-ETHERTON P M,PETERSEN K S,HIBBELN J R,et al. Nutrition and behavioral health disorders:depression and anxiety[J]. **Nutrition Reviews**,2021,79(3):247-260.

[22] MÖRKL S,BUTLER M I,HOLL A,et al. Probiotics and the microbiota-gut-brain axis:focus on psychiatry[J]. **Current Nutri–**

tion Reports,2020,9(3):171-182.
[23] YUAN X,KANG Y,ZHUO C,et al. The gut microbiota promotes the pathogenesis of schizophrenia via multiple pathways[J]. **Biochemical and Biophysical Research Communications**,2019,512(2):373-380.
[24] CRYAN J F,O'RIORDAN K J,COWAN C,et al. The microbiota-gut-brain axis[J]. **Physiological Reviews**,2019,99(4):1877-2013.
[25] LACH G,SCHELLEKENS H,DINAN T G,et al. Anxiety,depression,and the microbiome:a role for gut peptides [J]. **Neurotherapeutics**,2018,15(1):36-59.
[26] GE T,FAN J,YANG W,et al. Leptin in depression:a potential therapeutic target[J]. **Cell Death & Disease**,2018,9(11):1096.
[27] KHANNA D,JINDAL N,SINGH H,et al. Applications and challenges in healthcare big data:a strategic review[J]. **Current Medical Imaging**,2022(3):707-720.
[28] WANG C,PAN R,WAN X,et al. A longitudinal study on the mental health of general population during the COVID-19 epidemic in China[J]. **Brain Behavior and Immunity**,2020,87:40-48.
[29] SARRIS J,LOGAN A C,AKBARALY T N,et al. Nutritional medicine as mainstream in psychiatry[J]. **Lancet Psychiatry**,2015,2(3):271-274.
[30] LUPPINO F S,de WIT L M,BOUVY P F,et al. Overweight,obesity,and depression:a systematic review and meta-analysis of longitudinal studies[J]. **Archives of General Psychiatry**,2010,67(3):220-229.
[31] HUDSON J I,HIRIPI E,POPE H J,et al. The prevalence and correlates of eating disorders in the national comorbidity survey replication[J]. **Biological Psychiatry**,2007,61(3):348-358.
[32] LAI J S,HILES S,BISQUERA A,et al. A systematic review and meta-analysis of dietary patterns and depression in community-dwelling adults[J]. **American Journal of Clinical Nutrition**,2014,99(1):181-197.
[33] JACKA F N,O'NEIL A,OPIE R,et al. A randomized controlled trial of dietary improvement for adults with major depression(the 'SMILES' trial)[J]. **BMC Medicine**,2017,15(1):23.
[34] JACKA F N,PASCO J A,MYKLETUN A,et al. Association of Western and traditional diets with depression and anxiety in women[J]. **American Journal of Psychiatry**,2010,167(3):305-311.
[35] MOLENDIJK M,MOLERO P,ORTUNO S F,et al. Diet quality and depression risk:a systematic review and dose-response meta-analysis of prospective studies[J]. **Journal of Affective Disorders**,2018,226:346-354.
[36] BROOKS S K,WEBSTER R K,SMITH L E,et al. The psychological impact of quarantine and how to reduce it:rapid review of the evidence[J]. **Lancet**,2020,395(10227):912-920.
[37] WHO. Depression and other common mental disorders: Global health estimates[EB/OL]. https://www.who.int/publications/i/item/depression-global-health-estimates,2017-01-03/2022-05-01.
[38] PARLETTA N,ZARNOWIECKI D,CHO J,et al. A mediterranean-style dietary intervention supplemented with fish oil improves diet quality and mental health in people with depression:a randomized controlled trial (HELFIMED) [J]. **Nutritional Neuroscience**,2019,22(7):474-487.
[39] JONES A D. Food insecurity and mental health status:a global analysis of 149 countries[J]. **American Journal of Preventive Medicine**,2017,53(2):264-273.
[40] FIRTH J,TEASDALE S B,ALLOTT K,et al. The efficacy and safety of nutrient supplements in the treatment of mental disorders:a meta-review of meta-analyses of randomized controlled trials[J]. **World Psychiatry**,2019,18(3):308-324.
[41] FAIRBURN C G,COOPER Z,SHAFRAN R. Cognitive behavior therapy for eating disorders:a "transdiagnostic" theory and treatment[J]. **Behaviour Research and Therapy**,2003,41(5):509-528.
[42] FAIRBURN C G,HARRISON P J. Eating disorders[J]. **Lancet**,2003,361(9355):407-416.
[43] FAIRBURN C G,BOHN K. Eating disorder NOS (EDNOS):An example of the troublesome "not otherwise specified"(NOS) category in DSM-IV[J]. **Behaviour Research and Therapy**,2005,43(6):691-701.
[44] FAIRBURN C G,COOPER Z,BOHN K,et al. The severity and status of eating disorder NOS:Implications for DSM-V[J]. **Behaviour Research and Therapy**,2007,45(8):1705-1715.
[45] FAIRBURN C G. Cognitive behavior therapy and eating disorders[M]. New York:Guilford Press,2008:324.
[46] FAIRBURN C G,COOPER Z,DOLL H A,et al. Transdiagnostic cognitive-behavioral therapy for patients with eating disorders:a two-site trial with 60-week follow-up[J]. **The American Journal of Psychiatry**,2009,166(3):311-319.
[47] BULIK C M,TOZZI F,ANDERSON C,et al. The relation between eating disorders and components of perfectionism[J]. **The**

American Journal of Psychiatry,2003,160(2):366-368.
[48] BULIK C M,SULLIVAN P F,TOZZI F,et al. Prevalence,heritability,and prospective risk factors for anorexia nervosa[J]. **Archives of General Psychiatry**,2006,63(3):305-312.
[49] STROBER M,FREEMAN R,LAMPERT C,et al. The association of anxiety disorders and obsessive-compulsive personality disorder with anorexia nervosa:Evidence from a family study with discussion of nosological and neurodevelopmental implications[J]. **International Journal of Eating Disorders**,2007,40(Suppl):S46-S51.
[50] MURRAY S B,STROBER M,CRASKE M G,et al. Fear as a translational mechanism in the psychopathology of anorexia nervosa[J]. **Neuroscience and Biobehavioral Reviews**,2018,95:383-395.
[51] BULIK C M,BERKMAN N D,BROWNLEY K A,et al. Anorexia nervosa treatment:a systematic review of randomized controlled trials[J]. **International Journal of Eating Disorders**,2007,40(4):310-320.
[52] BULIK C M,THORNTON L,PINHEIRO A P,et al. Suicide attempts in anorexia nervosa[J]. **Psychosomatic Medicine**,2008,70(3):378-383.
[53] WALSH B T,KAPLAN A S,ATTIA E,et al. Fluoxetine after weight restoration in anorexia nervosa:a randomized controlled trial[J]. **The Journal of the American Medical Association**,2006,295(22):2605-2612.
[54] STEIGER H,BRUCE K R. Phenotypes,endophenotypes,and genotypes in bulimia spectrum eating disorders[J]. **Canadian Journal of Psychiatry**,2007,52(4):220-227.
[55] MOLENDIJK M L,de KLOET E R. Immobility in the forced swim test is adaptive and does not reflect depression[J]. **Psychoneuroendocrinology**,2015,62:389-391.
[56] KECK P J,MINTZ J,MCELROY S L,et al. Double-blind,randomized,placebo-controlled trials of ethyl-eicosapentanoate in the treatment of bipolar depression and rapid cycling bipolar disorder[J]. **Biological Psychiatry**,2006,60(9):1020-1022.
[57] TIEMEIER H,TUIJL H R,HOFMAN A,et al. Plasma fatty acid composition and depression are associated in the elderly:the rotterdam study[J]. **American Journal of Clinical Nutrition**,2003,78(1):40-46.
[58] TANSKANEN A,HIBBELN J R,HINTIKKA J,et al. Fish consumption,depression,and suicidality in a general population[J]. **Archives of General Psychiatry**,2001,58(5):512-513.
[59] FLEGAL K M,CARROLL M D,OGDEN C L,et al. Prevalence and trends in obesity among US adults,1999-2000[J]. **The Journal of the American Medical Association**,2002,288(14):1723-1727.
[60] FLEGAL K M,CARROLL M D,OGDEN C L,et al. Prevalence and trends in obesity among US adults,1999-2008[J]. **The Journal of the American Medical Association**,2010,303(3):235-241.
[61] FLEGAL K M,KRUSZON-MORAN D,CARROLL M D,et al. Trends in obesity among adults in the united states,2005 to 2014[J]. **The Journal of the American Medical Association**,2016,315(21):2284-2291.
[62] LOPRESTI A L,HOOD S D,DRUMMOND P D. A review of lifestyle factors that contribute to important pathways associated with major depression:diet,sleep and exercise[J]. **Journal of Affective Disorders**,2013,148(1):12-27.
[63] VANCAMPFORT D,CORRELL C U,GALLING B,et al. Diabetes mellitus in people with schizophrenia,bipolar disorder and major depressive disorder:a systematic review and large-scale meta-analysis[J]. **World Psychiatry**,2016,15(2):166-174.
[64] RODGERS R F,LOMBARDO C,CEROLINI S,et al. The impact of the COVID-19 pandemic on eating disorder risk and symptoms[J]. **International Journal of Eating Disorders**,2020,53(7):1166-1170.
[65] GEARHARDT A N,SCHULTE E M. Is food addictive? a review of the science[J]. **Annual Review of Nutrition**,2021,41:387-410.
[66] BENZEROUK F,GIERSKI F,DUCLUZEAU P H,et al. Food addiction,in obese patients seeking bariatric surgery,is associated with higher prevalence of current mood and anxiety disorders and past mood disorders[J]. **Psychiatry Research**,2018,267:473-479.
[67] NUNES-NETO P R,KÖHLER C A,SCHUCH F B,et al. Food addiction:prevalence,psychopathological correlates and associations with quality of life in a large sample[J]. **Journal of Psychiatric Research**,2018,96:145-152.
[68] ZHAO Z,MA Y,HAN Y,et al. Psychosocial correlates of food addiction and its association with quality of life in a non-clinical adolescent sample[J]. **Nutrients**,2018,10(7):837-849.
[69] LI S,SCHULTE E M,CUI G,et al. Psychometric properties of the Chinese version of the modified Yale Food Addiction Scale version 2.0(C-mYFAS 2.0):prevalence of food addiction and relationship with resilience and social support[J]. **Eating and Weight Disorders**,2022,27(1):273-284.

[70] MEADOWS A,NOLAN L J,HIGGS S. Self-perceived food addiction:prevalence,predictors,and prognosis[J]. **Appetite**,2017,114:282-298.
[71] CHAO A M,SHAW J A,PEARL R L,et al. Prevalence and psychosocial correlates of food addiction in persons with obesity seeking weight reduction[J]. **Comprehensive Psychiatry**,2017,73:97-104.
[72] WISS D,BREWERTON T. Separating the signal from the noise:how psychiatric diagnoses can help discern food addiction from dietary restraint[J]. **Nutrients**,2020,12(10):2937-2966.
[73] HORSAGER C,FARK E,GEARHARDT A N,et al. Food addiction comorbid to mental disorders in adolescents:a nationwide survey and register-based study[J]. **Eating and Weight Disorders**,2022,27(3):945-959.
[74] BLÜHER M. Obesity:Global epidemiology and pathogenesis[J]. **Nature Reviews Endocrinology**,2019,15(5):288-298.
[75] WEISS F,BARBUTI M,CARIGNANI G,et al. Psychiatric aspects of obesity:a narrative review of pathophysiology and psychopathology[J]. **Journal of Clinical Medicine**,2020,9(8):2344-2362.
[76] SIMON G E,KORFF M,SAUNDERS K,et al. Association between obesity and psychiatric disorders in the US adult population [J]. **Archives of General Psychiatry**,2006,63(7):824-830.
[77] MEHRZAD R. Obesity global impact and epidemiology[M]. Cambridge:Elsevier Academic Press,2020.
[78] MARTÍNEZ-GONZÁLEZ M A,SÁNCHEZ-VILLEGAS A. Food patterns and the prevention of depression[J]. **Proceedings of the Nutrition Society**,2016,75(2):139-146.
[79] NICOLAU J,ROMEROSA J M,RODRÍGUEZ I,et al. Associations of food addiction with metabolic control,medical complications and depression among patients with type 2 diabetes[J]. **Acta Diabetologica**,2020,57(9):1093-1100.
[80] FARZI A,HASSAN A M,ZENZ G,et al. Diabesity and mood disorders:multiple links through the microbiota-gut-brain axis[J]. **Molecular Aspects of Medicine**,2019,66:80-93.
[81] MILLS J G,THOMAS S J,LARKIN T A,et al. Overeating and food addiction in major depressive disorder:links to peripheral dopamine[J]. **Appetite**,2020,148:104586.
[82] MILLS J G,LARKIN T A,DENG C,et al. Weight gain in major depressive disorder:linking appetite and disordered eating to leptin and ghrelin[J]. **Psychiatry Research**,2019,279:244-251.
[83] IVEZAJ V,WIEDEMANN A A,LAWSON J L,et al. Food addiction in sleeve gastrectomy patients with loss-of-control eating[J]. **Obesity Surgery**,2019,29(7):2071-2077.
[84] TRAN H,POINSOT P,GUILLAUME S,et al. Food addiction as a proxy for anorexia nervosa severity:new data based on the yale food addiction scale 2.0[J]. **Psychiatry Research**,2020,293:113472.
[85] TREASURE J,DUARTE T A,SCHMIDT U. Eating disorders[J]. **Lancet**,2020,395(10227):899-911.
[86] SILVA Y P,BERNARDI A,FROZZA R L. The role of short-chain fatty acids from gut microbiota in gut-brain communication[J]. **Frontiers in Endocrinology(Lausanne)**,2020,11:25-39.
[87] WŁODARCZYK A,CUBAŁA W J,STAWICKI M. Ketogenic diet for depression:a potential dietary regimen to maintain euthymia?[J]. **Progress Neuropsychopharmacol Biological Psychiatry**,2021,109:110257.
[88] DINAN T G,STANTON C,LONG-SMITH C,et al. Feeding melancholic microbes:MyNewGut recommendations on diet and mood[J]. **Clinical Nutrition**,2019,38(5):1995-2001.
[89] RAJANALA K,KUMAR N,CHAMALLAMUDI M R. Modulation of Gut-Brain axis by probiotics:a promising anti-depressant approach[J]. **Current Neuropharmacology**,2021,19(7):990-1006.
[90] SUBLETTE M E,CHEUNG S,LIEBERMAN E,et al. Bipolar disorder and the gut microbiome:a systematic review[J]. **Bipolar Disorders**,2021,23(6):544-564.
[91] LOF J,SMITS K,MELOTTE V,et al. The health effect of probiotics on high-fat diet-induced cognitive impairment,depression and anxiety:a cross-species systematic review[J]. **Neuroscience and Biobehavioral Reviews**,2022,136:104634.
[92] ABILDGAARD A,KERN T,PEDERSEN O,et al. A diet-induced gut microbiota component and related plasma metabolites are associated with depressive-like behavior in rats[J]. **European Neuropsychopharmacology**,2021,43:10-21.
[93] SUGANYA K,KOO B S. Gut-Brain axis:Role of gut microbiota on neurological disorders and how probiotics/prebiotics beneficially modulate microbial and immune pathways to improve brain functions[J]. **International Journal of Molecular Sciences**,2020,21(20):7551-7580.
[94] YANG Y,ZHAO S,YANG X,et al. The antidepressant potential of lactobacillus casei in the postpartum depression rat model mediated by the microbiota-gut-brain axis[J]. **Neuroscience Letters**,2022,774:136474.