Evaluation

'*How can food influence the brain's influence of mood?'*

Summary

Driven by my interest about the prevalence of fad diets in society and coupled with my growing awareness of positive psychology and mental health, my research question, *'How can food influence the brain's regulation of mood'*, explored the interactions between these topics.

Analysis of journal articles, organisational website articles as well as interviews within the medical, pharmaceutical, dietetic, and naturopathic fields, enabled me to explore the different perspectives involved in this complex topic. My findings are presented in an accessible poster format with the intent to be displayed in public health facilities, incorporating QR-code technology to allow more extensive research to be shared. Research revealed that for stable regulation of mood, the body needs to be fuelled with the correct balance of nutrients to allow for optimal function. Discretionary foods, saturated and trans-saturated fats should be avoided or reduced as they negatively alter bodily functions, thereby impacting mood.

E1:E2 – Evaluation of Research Processes & Decisions in Response to Challenges and Opportunities

The analysis of articles from organisational health websites was an extremely effective key process in providing credible foundational information to commence my research. Simple Google searches led to the accessible article, '*Nutritional Psychiatry: Your brain on food'*[33] from Harvard Health Publishing which allowed me to identify the different elements of the topic. The article's intent for widespread audience engagement caused a lack of depth, with shallow analysis of ideas and simplistic language. Nevertheless, this article and similar website-based sources were considerably useful to establish 'target' areas from which more comprehensive investigation could be conducted.

Accessing journal articles, meta-analyses, and reports from databases such as PubMed and BMC, displayed the benefit of deciding to pursue academic material addressing the simplistic explanations in the seminal article. They were invaluable to my research process, providing me with highly credible information, more predominantly qualitative than quantitative, with very limited bias. '*Feeding Minds'*[10], a report conducted by the *Mental Health Foundation* (UK) was acutely useful as it displayed clear, conclusive, referenced evidence. Furthermore, the presentation of quantitative data in the form of tables and graphs, facilitated my inference of key points from the source.

As the research into the relationship between nutrition and mood is only in its infancy, currency of sources was good but conclusions were scant. For example, a journal article titled '*The gut microbiome and diet in psychiatry'*, stated '*the modification of the gut microbiome **may** have utility in preventing depression'*[12]. Numerous article abstracts contained the words 'may' and 'potential', especially surrounding on the gut's role in the topic question. With the conclusiveness of articles being questionable, I learnt to be critical of content and judge an article's suitability to my topic by analysing a text for reliable, supported key points. Furthermore, I found articles containing quantitative data were generally unsuitable for my research as the specificity of numerical values and results derived were overall insignificant to answering my question.

These academic articles were greatly complex and specific, yet their depth supported my understanding of the biological concepts, such as the bodily processes, providing me with more scope to comprehend the biological and psychological jargon of the research. This subsequently provoked a more concise, valid, and informed outcome. The complexity of articles meant I did not initially observe similarities between them. However, cross referencing enabled me to establish genuinely reliable key points within the 32 academic materials utilised.

For further guidance and clarification, I made the decision to contact Dr Amy Loughman[21], an active researcher working in the Food and Mood Centre at Deakin University. Dr Loughman's name appeared in previously analysed articles, '*Lactobacillus and Anxiety: What's the Link?*'[20] and '*…Where does inflammation come from?*'[3], making her a significantly valid and credible source. This interview was the most valuable research process of my entire project, as Dr Loughman's background and familiarity with research enabled her to provide guidance and ideas to advance my research. At this stage of the project, I was overwhelmed by the numerous potential avenues to focus my research on and decided to take a step back and look at the big picture. Prior to the interview I had found a short and simple educational *TedEd Talk* video conveniently titled '*How the food you eat affects your brain*'[36], so I observed it again objectively. I found this process to be extremely valuable as it allowed me to revisit the foundations of my knowledge and determine what I needed to focus on to progress forward with my research.

Dr Loughman was unambiguously upfront about her bias on the gut microbiome, making her information credible but not greatly useful as it held limited connection to mood. However, her recommendation of the credible Biopsychosocial Model[17] for use as a guideline in my research on mood heightened the credibility of the outcome. By cross referencing key points, I deduced the 'emotions' and 'mood' elements of the question were primarily based on more conclusive evidence, thus decided this to be my topic focus to heighten the reliability of the outcome. The analysis of the gut's role in mood would be the minor focus. Furthermore, existing theoretical framework of the Biopsychosocial Model served as an invaluable tool for the collation and organisation of research.

My interview with Dr Loughman highlighted the need for different informed perspectives in this complex research area. Thus, my decision to contact people from a range of health fields provided highly useful information. It was a challenge to make contacts but the decision to network with family paid dividends as I was able to obtain four interviews. The first two were via email with Nutritionist Teresa Barbaro[2] and Clinical Pharmacist Dr Joyce McSwan[23], which had significant limitations as the format was not interactive, inhibiting the ability for follow up questions. Yet, Ms Barbaro's answers were exceedingly thorough with valid, and evidently reliable information, recognised through my cross referencing (she confirmed 19 key points previously established). Throughout the interview process I looked to attain consistency by asking the same questions, prompted by secondary sources, increasing the value of the interview process greatly. However, my fourth interview with Naturopath Kathy Sedun[31], was somewhat unsuccessful as her responses were largely irrelevant to my 'emotions' focus, however the interview's phone format provided the opportunity of follow up questions, leading to beneficial background information about the gut. Similarly, the face-to-face interview with GP Dr Girolamo Vinci[42] provided opportunity for easier communication. I went into these interviews following ethical research practice in terms of permissions and informed consent, and appropriate referencing was utilised in the outcome. In

addition, I had the assumption there would be considerable differences between answers, due to the different knowledge base and training attached to each interviewee's work. Nevertheless, it was remarkable to observe cross referencing reveal significant agreement of ideas, namely between Dr McSwan's theme of the glycaemic index and Dr Vinci's observation of blood sugar instabilities and their respective influences on mood. There were no distinctive differences between interviews rather a variable focus upon different elements of the question, where, for example, the nutritionist saw the biological and psychological interactions of food, whilst the General Practitioner looked at how food '*is used to make a statement*'[42]. Overall, the interview process was extremely valuable as it furthered my understanding, crystalised my conclusions, and reinforced the reliability of my information.

E3 – Evaluation of the Quality of the Outcome

My Outcome provided an insightful interpretation of my research topic, answering my question to a certain extent, although not resolving it conclusively nor definitively. I acknowledge that due to the complexity of my research topic, there would always be scope for further investigation into different elements, given a greater word count and timeframe.

Nonetheless, I was able to present key findings concisely while still representing the perspectives of this topic. Currency is varied throughout my research project, areas such as background information as well as the potential harmful effects of food benefit from long-standing research. Other areas of research, such as the gut-brain axis, are still emerging and conclusions drawn are expected to change within the next few years. As a result, the accuracy of my outcome is strengthened in the areas of longstanding information and limited where recent research was utilised.

A strength of my outcome was its accessibility in a poster format, the simplification of complex research emulating the website articles of initial research. Through its visual representation, it is accessible to the public, where ease of access mirrors the intention of the research. Additionally, inclusion of QR technology enables interested individuals to learn more from the accompanying report. A thorough 'Background' section referencing 35 of my 46 sources, provides sufficient context for a public audience to comprehend the conclusions drawn in the outcome body.

A possible limitation of my outcome was the dominance of secondary sources. A greater number of primary sources could have been strengthened the credibility and quality of conclusions drawn. However, such reliance on secondary sources is almost inevitable; nutritional psychiatry is an emerging field and academics from biological, psychological, nutritional disciplines are producing and reviewing studies regularly. Having said this, the interviews conducted with health professionals would be informed by similar academic material.

Through challenging my assumptions about the involvement of nutrition and food in both physical and mental processes, this research was invaluable. While thorough cross referencing indicated valid and reliable conclusions, nutritional psychiatry is a relatively new discipline of health, development in proceeding years is likely to eventually change my findings. Nonetheless, I believe my answer would have a profound impact as a public health message through the shared analysis of how food can influence mood. Furthermore, I think many people would find my poster to be an interesting, yet useful addition to their doctor's waiting room experience.

Outcome Poster

Your mood is a **conversation** between your gut and your brain.

Signals to the brain **release hormones and neurotransmitters** forming our emotions.

To keep your mood regulated your body needs to be functioning at its best.
Avoid consuming foods that can cause harm.

Eating specific foods will not provoke specific emotions, however, your **mood needs to be regulated** efficiently by the brain to reduce mood disturbances.

FEELING BLUE? CHECK YOUR FOOD.

FOOD CAN CAUSE **HARM** IN TWO WAYS:

Trick Foods

- not nutrient dense
- 'quick fixes' for cravings.

Make you **feel worse**, and crave more

cravings

occur when **blood sugar levels are irregular**. trick/comfort foods are **NOT** sustainable sources of energy.

AVOID:
- chocolates
- sugary drinks
- fried foods

OPT FOR:
- nuts/seeds
- wholegrain products
- fresh foods

Opt for low GI foods, providing energy, stabilizing blood sugar levels and reducing future incidences of cravings

Damaging Foods

- increase oxidants in the body
- damaging body's environment

Damage to the brain impairs its **ability to function**

oxidants

Unstable molecules that injure the body's healthy cells, damaging DNA and healthy tissues.

AVOID:
- fatty/fried foods
- saturated/trans fats

OPT FOR:
- fatty fish
- avocadoes

Opt for omega 3 and 6 essential fatty acids, promoting heathy cognitive function, stable regulation of mood.

HOW TO ENSURE FOOD HAS A **POSITIVE** INFLUENCE

Believe in the 5 'Supergroups'

For optimal brain function, you need a sufficient balance of:

complex carbohydrates	wholegrains, vegetables
essential fatty acids	nuts/seeds, fatty fish
amino acids	lean meats, fish (protein)
vitamins/minerals	fruits, vegetables, grains
water	fruits, vegetables, drink

Good nutrition will allow your brain and body to regulate your mood correctly, reduce incidences of mood disturbances, allow you to feel better.

Eating Environent

Your busy schedule shouldn't impede your nutritional intake and ability to eat socially.

Eating socially can help to improve your mood.

eating with others = living happier and satisfied

For more information, scan this QR code

QR code provides link to report.

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