

**Coping strategies among suspected food intolerant patients: relationships to psychological factors, personality and quality of life.**

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The research presented in this report was conducted by the candidate under the guidance of the supervisors above. I Lisa Andersson (the candidate) collected and entered data with assistance from Stephanie Pallas; and independently undertook data analysis.

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This study aimed to classify RPAH Allergy Unit patients with suspected food intolerance into coping style categories, linking these to psychological, personality and quality of life scores for improved adherence and effectiveness of the RPAH Elimination Diet as a diagnostic tool.

A prospective, observational study was conducted at the RPAH Allergy Unit between March 2014 and April 2015. Data was collected using Allergy Unit Patient Information Form, World Health Organisation Quality of Life-Bref Form, Coping Inventory for Stressful Situations Form, Beck Depression Index-Second Edition, State Trait Anxiety Index Y Form and Eating Disorder Examination Questionnaire. Data was entered into Microsoft Excel 2007 and Prism (Version 6), with descriptive and statistical (Pearson's correlation) analyses performed.

Data analysis of 97 study participants found task-oriented coping was significantly negatively correlated with all psychological parameters and neuroticism, while positively correlated with psychological and environmental quality of life. Emotion-oriented coping was significantly positively correlated with all psychological parameters and neuroticism, while negatively correlated with psychological and environmental quality of life. Avoidance-oriented coping was negatively correlated with depression, while positively correlated to extraversion, agreeableness and psychological quality of life.

This study reproduces links between specific coping styles and psychological symptoms experienced by patients at the RPAH Allergy Unit, as seen in other study populations. Results are useful for tailoring RPAH Elimination Diet education to individual coping

styles, increasing dietary adherence and success rates of this diagnostic tool. Future research should focus on coping styles of diet non-starters and drop-outs to identify psychological trends.

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**Declaration**

*The candidate, Lisa Andersson, hereby declare that none of the work presented in this essay has been submitted to any other University or Institution for a higher degree and that to the best of her knowledge contains no material written or published by another person, except where due reference is made in text.*

Signature

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Dated on 5<sup>th</sup> June, 2015

**Coping strategies among suspected food intolerant patients: relationships to psychological factors, personality and quality of life.**

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## **Abstract**

**Aim:** This study aimed to classify RPAH Allergy Unit patients with suspected food intolerance into coping style categories, linking these to psychological, personality and quality of life scores for improved adherence and effectiveness of the RPAH Elimination Diet as a diagnostic tool.

**Methods:** A prospective, observational study was conducted at the RPAH Allergy Unit between March 2014 and April 2015. Data was collected using Allergy Unit Patient Information Form, World Health Organisation Quality of Life-Bref Form, Coping Inventory for Stressful Situations Form, Beck Depression Index-Second Edition, State Trait Anxiety Index Y Form and Eating Disorder Examination Questionnaire. Data was entered into Microsoft Excel 2007 and Prism (Version 6), with descriptive and statistical (Pearson's correlation) analyses performed.

**Results:** Data analysis of 97 study participants found task-oriented coping was significantly negatively correlated with all psychological parameters and neuroticism, while positively correlated with psychological and environmental quality of life. Emotion-oriented coping was significantly positively correlated with all psychological parameters and neuroticism, while negatively correlated with psychological and environmental quality of life. Avoidance-oriented coping was negatively correlated with depression, while positively correlated to extraversion, agreeableness and psychological quality of life.

**Conclusions:** This study reproduces links between specific coping styles and psychological symptoms experienced by patients at the RPAH Allergy Unit, as seen in

other study populations. Results are useful for tailoring RPAH Elimination Diet education to individual coping styles, increasing dietary adherence and success rates of this diagnostic tool. Future research should focus on coping styles of diet non-starters and drop-outs to identify psychological trends.

**Key words:** coping, elimination diet, food intolerance, psychological parameters.

## **Introduction**

While food may be considered the best medicine, this might not be the case for food sensitive individuals. Adverse food reaction diagnoses are increasing in incidence,<sup>1</sup> classified as immunological responses (including food allergy and coeliac disease) and non-immunological responses (including chemical food intolerance). Food allergy reactions are well defined and characterised by their reproducible, immediate, immunoglobulin E-mediated reactions to specific food proteins.<sup>1-3</sup> Food intolerances are a more obtuse symptom group, with chemical food intolerance suspected to be caused by aggravation of nerve endings as reactions to naturally occurring chemicals in food (e.g. salicylates, amines and glutamates), and/or synthetic chemicals (e.g. preservatives, colourings and monosodium glutamate).<sup>3,4</sup> Reactions to gluten, dairy and/or soy can also occur in sensitive individuals.<sup>5</sup>

Food chemical reactions can be grouped into: respiratory (e.g. rhinitis, asthma), skin (e.g. hives, eczema, angioedema), gastrointestinal (e.g. irritable bowel syndrome) and central nervous system (e.g. migraines, fatigue, hyperactivity) symptoms, with individuals manifesting these in varying degrees and combinations.<sup>2,6,7</sup> Symptoms are dose-dependent, can be cumulative, with no symptoms experienced until a chemical

threshold is attained.<sup>7</sup> As the reactant chemicals are present in a variety of foods, an individual's threshold is exceeded after eating combinations of foods, with reactions often attributed to the last food eaten.<sup>6,8</sup>

The first elimination diet was proposed by AH Rowe in 1926-1928 to elucidate specific foods causing reactions within individuals.<sup>9</sup> The Royal Prince Alfred Hospital (RPAH) Elimination Diet and Challenge Protocol was developed in the 1980s and is used at the RPAH Allergy Unit. The diet restricts food chemical ingestion in three levels: strict, moderate and simple.<sup>7</sup>

Adherence to dietary advice is lowest of all healthcare treatment types.<sup>10</sup> This is concerning as misunderstanding or ignoring dietary (or medical) prescription has detrimental effects on treatment outcomes and patient quality of life.<sup>11,12</sup> This effect is evident in restrictive diets, such as the low protein diet for diabetic nephropathy, where diet burden can lead to discontinuation.<sup>13</sup> Such trends, while not yet investigated, may extend to patients following the RPAH Elimination Diet, knowing that diet adherence is critical for accurate diagnosis through food and/or purified food chemical double-blind placebo capsule challenges, and individual diet prescription with subsequent liberalisation.

Psychological conditions have been associated with poor gluten-free compliance and lower quality of life in coeliac disease patients.<sup>14</sup> Current literature shows higher prevalence of psychological factors, such as depression, anxiety and eating disorders, in patients prescribed restricted diets.<sup>15-17</sup> Further, correlations are seen between levels of depressive symptomatology and coping styles employed, with task- and

avoidance-oriented coping negatively correlated with depression and the reverse found with emotion-oriented coping.<sup>18</sup> This can be extrapolated further, with correlations found between maladaptive coping styles and personality dimensions.<sup>19</sup>

To effectively prescribe diets and predict dietary adherence, we must establish relationships between psychological factors, personality, and patient quality of life. Research must elucidate whether these negative trends are present in RPAH Allergy Unit patients who are prescribed the restrictive, but temporary, diagnostic RPAH Elimination Diet and Challenge Protocol. This study aims to classify RPAH Allergy Unit patients into common coping styles, linking these to psychological parameters already researched in this population, to ultimately incorporate these factors for improved dietary adherence to and effectiveness of the RPAH Elimination Diet as a diagnostic tool.

## **Methods**

This was a prospective, observational study, as part of a larger ongoing five year clinical study at the RPAH Allergy Unit. Ethics approval was given by Sydney Local Health District Human Research Ethics Committee (RPAH Zone), protocol no: X13 – 0208. The study conforms to the provisions of the Declaration of Helsinki (as revised in Edinburg 2008).

Potential study participants were contacted via telephone between March 2014 and April 2015, one week prior to their initial appointment. Patients were interviewed using a script (Appendix I) and were asked to voluntarily join the study if they satisfied the inclusion criteria:

- Aged 18 years or over
- No previous education on food intolerance at the RPAH Allergy Unit, or started the RPAH Elimination Diet under a dietitian's care
- Suspected food intolerance(s) based on symptoms described: urticaria/angioedema, eczema, irritable bowel syndrome, migraine, food reactions or symptoms suspected to be food related.

Study information was emailed or posted prior to their initial appointment at the RPAH Allergy Unit.

During the initial appointment at the RPAH Allergy Unit, patients completed two clinic forms: Allergy Unit Patient Information Form and the World Health Organisation Quality of Life-Bref (WHOQoL-Bref) Form. Upon dietitian referral for the RPAH Elimination Diet, they completed four study forms: Coping Inventory for Stressful Situations (CISS) Form, Beck Depression Index-Second Edition (BDI-II), State Trait Anxiety Index (STAI) Y Form and Eating Disorder Examination Questionnaire (EDE-Q). Consent for study participation was implied by submission of one or all study forms. Incomplete forms were sent home with patients to complete and return using a supplied reply paid envelope.

The Patient Information Form is a self-reported 26-item questionnaire covering a range of demographic and social information including symptoms, diet modifications and personality. Personality questions were taken from the Big Five Inventory-10 (BFI-10), which assesses neuroticism, extraversion, openness, agreeableness and

conscientiousness. An optional additional item assessing agreeableness was also incorporated.<sup>20</sup>

WHOQoL-Bref (Australian version, 2000) is a 26-item generic quality of life tool adapted from WHO QoL-100. Patients use a five-point Likert scale with higher scores representing better quality of life.<sup>21</sup> Results are classified in four domains: physical health (pain, energy and work capacity), psychological (self-esteem, concentration and spirituality), social (relationships, support and sexual activity) and environmental (home, finance and transport). This tool has good validity and reliability in Australian adults.<sup>22</sup>

CISS uses 48 questions with a five-point Likert scale to assess patient coping strategies in stressful situations in three domains: task-, emotion- and avoidance-oriented coping. Avoidance-oriented coping has two subscales: distraction and social diversion.<sup>23</sup> Task-oriented copers are defined as those who actively plan, organise and solve problems, emotion-oriented copers are defined as those who become upset and blame themselves, while avoidance-oriented copers are defined as those who engage in behaviours that avoid the problem altogether.<sup>24,25</sup> Resulting scores are interpreted as: very much above/below average, much above/below average, above/below average or average.<sup>23</sup>

BDI-II uses 21 self-reported items to assess clinical status and severity of depression of patients. Exaggerated depression estimates are reduced by focusing on seven questions to calculate the BDI-Primary Care (BDI-PC) score, minimising confounding

influences of medical problems.<sup>26</sup> A BDI-PC >5 cut-off identifies patients with high likelihood of clinical depression, producing high clinical efficiency.<sup>27</sup>

STAI evaluates severity of State (reactive) and Trait (proneness) anxiety, with 20-items each. Established cut-offs of >44 and <26 (normal adult population mean  $\pm$  SD) identifies patients with high or low likelihood of elevated anxiety, respectively.<sup>28</sup>

EDE-Q assesses current (past 28 days) disordered behaviours and thoughts surrounding diet, exercise and body image through 28-items. Patients assessed as high risk of an eating disorder score  $\geq 2.3$  plus exhibit either excessive 'compulsive' exercise to control weight ( $\geq 20$  separate times) or binge eating behaviour ( $\geq 4$  separate times).<sup>29</sup>

The RPAH Allergy Unit Database was used to access patient demographic, diet and symptom information.

Data was analysed using Microsoft Office Excel 2007 and PRISM (Version 6, GraphPad Software). Analysis inclusion required submission of six completed forms. Descriptive (percentage and mean) and statistical analysis (Pearson's correlation) were performed.

## **Results**

Telephone contact was attempted for 1205 patients prior to initial appointment. 928 (77.0%) patients answered, with 442 (47.6%) agreeing to accept study information. At the initial appointment 168 (38.0%) were referred to a dietitian and gave informed consent to participate (total study cohort). From this cohort, 97 (57.7%) completed all forms for analysis inclusion (study sample).

The study sample population were representative of the total study cohort in terms of age, gender distribution, average number of organ systems affected by food intolerance, education and employment status, prior diet modifications and prescribed strictness of the RPAH Elimination Diet (Table 1).

**Table 1:** Comparing patient characteristics between the study sample and all study patients.

<i>Variable</i>	<i>Sample (n=97)</i>	<i>All Study Patients (n=168)</i>
<i>Prescribed strictness level of diet:</i>		
Simple, n (%)	2 (2.1)	7 (4.2)
Moderate, n (%)	20 (20.6)	34 (20.2)
Strict, n (%)	75 (77.3)	127 (75.6)
<i>Presenting diet modifications:</i>		
Restricted, n (%)	47 (48.5)	75 (44.6)
<i>Number of organ systems affected by suspected food intolerance:</i>		
Presenting (mean)	1.47	1.5
Current (mean)	2.62	2.63
<i>Demographics:</i>		
Age (mean)	41.18	41.24
Gender (% F)	76.3	79.8
Highest education completed (% Tertiary)	64.9	61.7
Employment (% Full Time)	41.2	39.1

CISS domain t-scores were compared to adult population norms. Results were normally distributed with mean t-scores within 'average' classification ranges of 45-55 for each domain (Task = 51.68, Emotion = 47.98, Avoidance = 51.09, Distraction = 47.48, Social Diversion = 49.31). (Graphical translation in Appendix II)

CISS domain t-scores were compared to BDI-PC, STAI and EDE-Q scores using PRISM Pearson's correlation analysis, with  $r > 0.5$  showing strong correlation for psychological parameters,(30) and a p-value  $< 0.05$  showing significance (Table 2). There were significant correlations between task- and emotion-oriented coping and all other psychological scores, with avoidance (and social diversion) correlated with BDI-PC.

**Table 2:** Correlation Coefficients of CISS versus Psychological Parameters using Pearson's correlation coefficient (r) (n = 97)

<i>Psychological Parameters:</i>	<i>Coping Style Domains</i>			<i>Avoidance Subscales</i>	
	<i>TASK</i>	<i>EMOTION</i>	<i>AVOIDANCE</i>	<i>DISTRACTION</i>	<i>SOCIAL DIVERSION</i>
<i>BDI-PC †</i>	- 0.5***	0.51***	- 0.36***	0.02	- 0.44***
<i>S Anxiety ‡</i>	- 0.48***	0.52***	- 0.12	0.16	- 0.15
<i>T Anxiety §</i>	- 0.52***	0.64***	- 0.14	0.18	- 0.21*
<i>EDE-Q ¶</i>	- 0.32**	0.28**	0.07	0.09	- 0.02

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

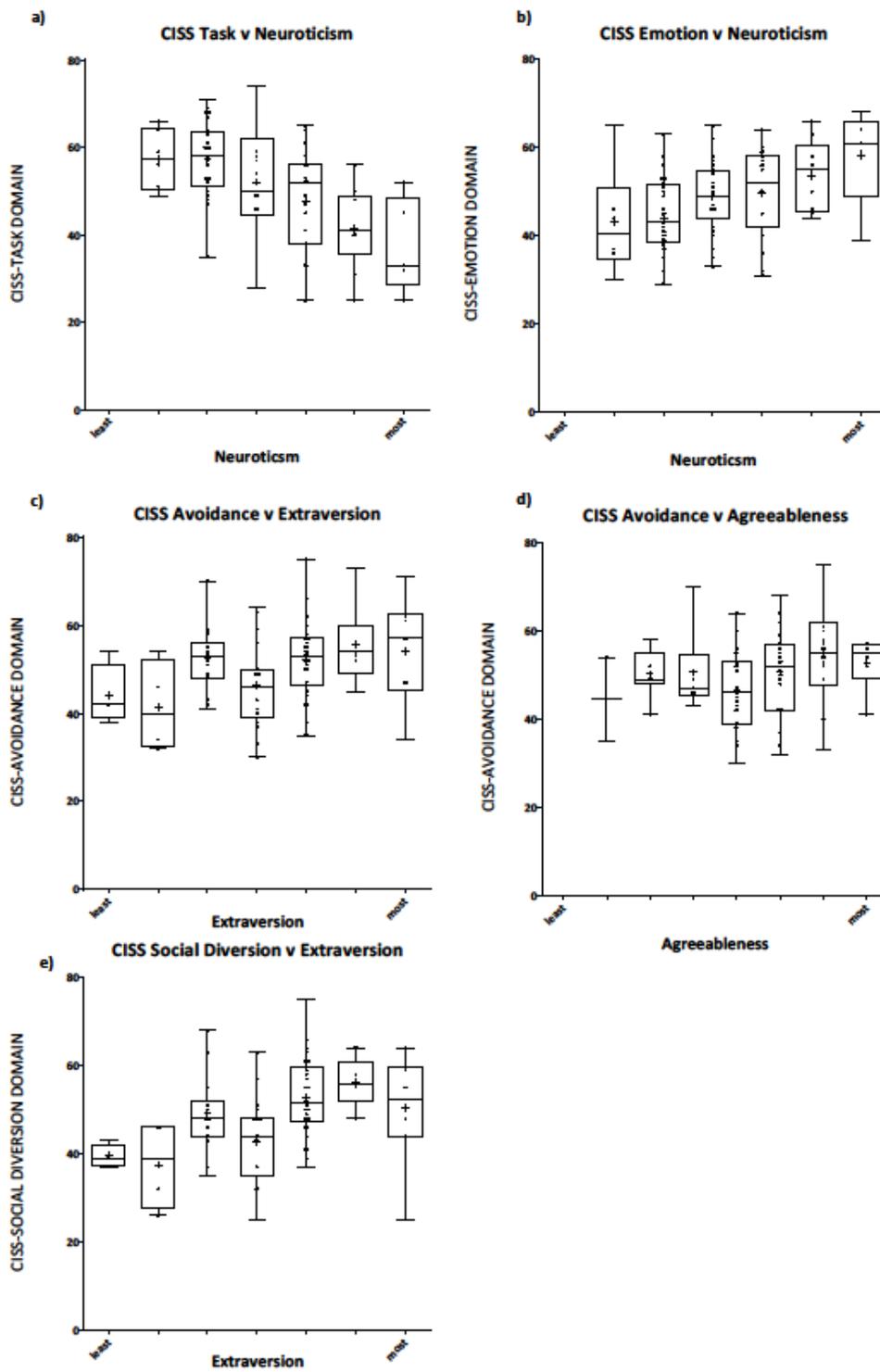
† BDI-PC, Beck Depression Index – Personal Care

‡ S Anxiety, State Anxiety

§ T Anxiety, Trait Anxiety

¶ EDE-Q, Eating Disorder Examination Questionnaire

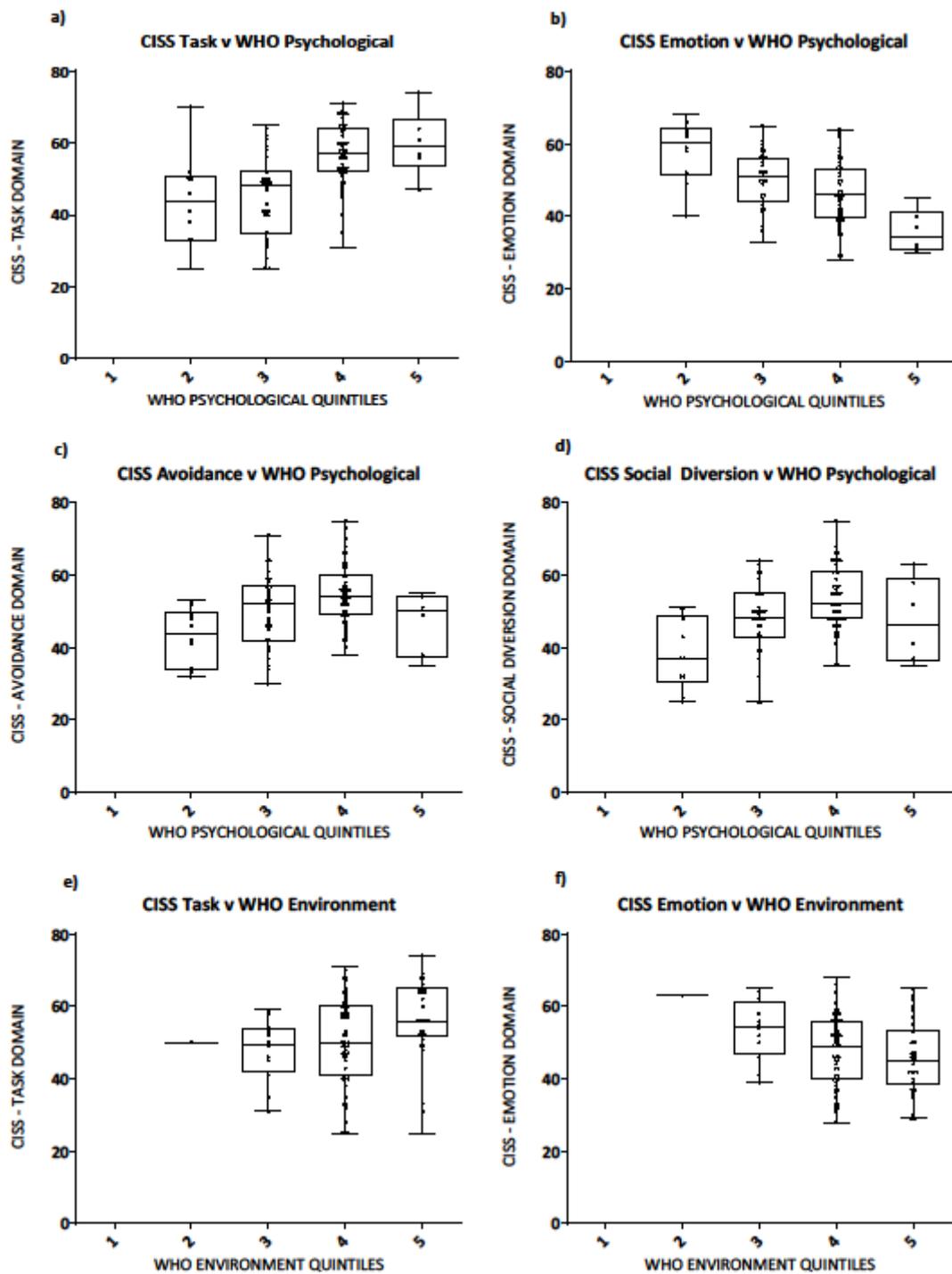
CISS domains were analysed against the BFI-10 (Figure 1), with neuroticism significantly negatively correlated to task-oriented coping ( $r = - 0.50$ ,  $p < 0.001$ ) and positively correlated to emotion-oriented coping ( $r = 0.40$ ,  $p < 0.001$ ) (Figure 1a, 1b). Extraversion was positively correlated with avoidance ( $r = 0.28$ ,  $p < 0.01$ ) and social diversion ( $r = 0.36$ ,  $p < 0.001$ ), while agreeableness was slightly positively correlated with avoidance-oriented coping ( $r = 0.22$ ,  $p = 0.03$ ) (Figure 1c, 1d, 1e).

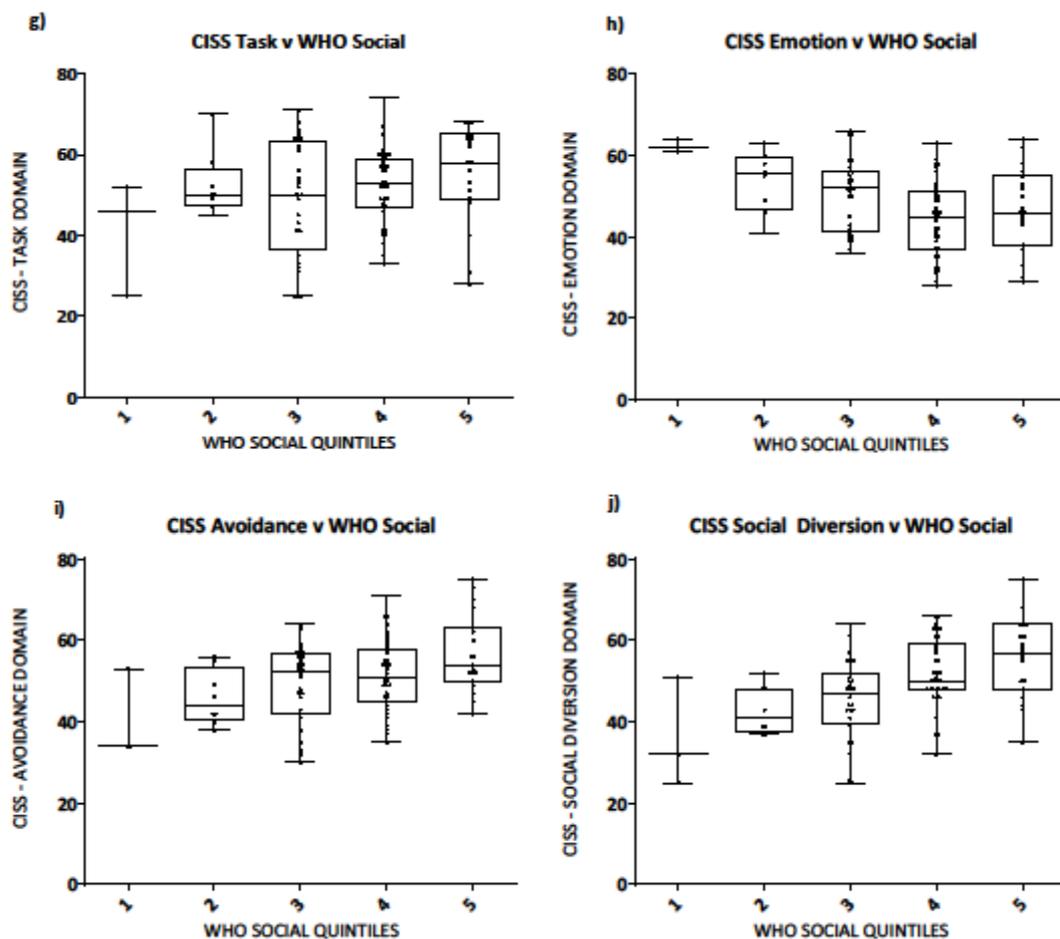


**Figure 1:** Summary of significant Coping Inventory for Stressful Situations (CISS) domain t-scores correlations with the level of Personality classifications (n = 97).

*Box and Whiskers Plot showing the mean, 25<sup>th</sup> and 75<sup>th</sup> centiles and the minimum and maximum scores. Dots are the individual patient scores. Higher CISS domain t-scores indicate increased use of the coping style. Personality classifications range from 'least' to 'most' with 'most' displaying the strongest characteristics. a) CISS Task Domain correlation analysis with Personality: Neuroticism, b) CISS Emotion Domain correlation analysis with Personality: Neuroticism, c) CISS Avoidance Domain correlation analysis with Personality: Extraversion, d) CISS Avoidance Domain correlation analysis with Personality: Agreeableness, e) CISS Social Diversion Domain correlation analysis with Personality: Extraversion.*

The psychological domain of the WHOQoL-Bref was positively correlated with task-oriented coping ( $r=0.51$ ,  $p<0.001$ ), avoidance coping ( $r=0.30$ ,  $p<0.01$ ), and social diversion ( $r=0.41$ ,  $p<0.001$ ) (Figures 2a, 2c, 2d), while a strong negative correlation was found with emotional-oriented coping ( $r= - 0.50$ ,  $p<0.001$ )(Figure 2b). The environmental domain had a large positive correlation with task-orientation ( $r=0.34$ ,  $p<0.001$ ) and a moderate reverse correlation with emotion-oriented coping ( $r= - 0.26$ ,  $p<0.01$ ) (Figures 2e, 2f). The social domain was somewhat positively correlated with task-oriented coping ( $r=0.20$ ,  $p=0.05$ ), with moderate to strong positive correlations with avoidance ( $r=0.35$ ,  $p<0.001$ ) and social diversion ( $r=0.48$ ,  $p<0.001$ ) and a moderate negative correlation with emotion-oriented coping ( $r= - 0.35$ ,  $p<0.001$ )(Figures 2g-j).





**Figure 2:** Coping Inventory for Stressful Situations (CISS) domain t-scores compared with World Health Organization Quality of Life-Bref (WHO QoL-Bref) domain scores (n = 97).

Box and Whiskers Plot showing the mean, 25<sup>th</sup> and 75<sup>th</sup> centiles and the minimum and maximum scores.

Dots are the individual patient scores. Higher CISS domain t-scores indicate increased use of the coping

style. WHO Quality of Life domain scores are categorised into quintiles. a) CISS Task Domain correlation

analysis with the Psychological Domain of the WHOQoL-Bref, b) CISS Emotion Domain correlation

analysis with the Psychological Domain of the WHOQoL-Bref, c) CISS Avoidance Domain correlation

analysis with the Psychological Domain of the WHOQoL-Bref, d) CISS Social Avoidance Domain

correlation analysis with the Psychological Domain of the WHOQoL-Bref, e) CISS Task Domain correlation

analysis with the Environment Domain of the WHOQoL-Bref, f) CISS Emotion Domain correlation analysis

with the Environment Domain of the WHOQoL-Bref, g) CISS Task Domain correlation analysis with the

*Social Domain of the WHOQoL-Bref, h) CISS Emotion Domain correlation analysis with the Social Domain of the WHOQoL-Bref, i) CISS Avoidance Domain correlation analysis with the Social Domain of the WHOQoL-Bref, j) CISS Social Diversion Domain correlation analysis with the Social Domain*

## **Discussion**

This study increases knowledge of psychological symptoms displayed by adult patients suspected of food intolerance at the RPAH Allergy Unit. Coping styles are related to an individual's approach to stressful events and can promote or inhibit physical and mental health,<sup>23</sup> however they had not been previously investigated in this population.

The primary study purpose was establishing whether patient coping styles were significantly correlated to other psychological parameters (depression, anxiety and eating disorders), personality traits or quality of life to ultimately improve RPAH Elimination Diet prescription, adherence and effectiveness as a diagnostic tool.

The coping styles of the patients were normally distributed compared to validated adult norms,<sup>23</sup> which informs that patients who attend the clinic should be educated similarly to an average population. Although previous studies on coeliac disease show higher prevalence of psychological disorders amongst those on restrictive gluten-free diets,<sup>15,16</sup> a study done at the RPAH Allergy Unit found patients have similar prevalence of psychological issues to the general public.(Chiu, A., 1997) It must be highlighted that the gluten-free diet is a lifelong burden and therefore different to the diagnostic RPAH Elimination Diet.

Results reveal those patients with higher task scores (task-oriented copers) within the study are less likely to suffer from depression, anxiety or eating disorders, while those with higher emotion scores (emotion-oriented copers) more likely have concurrent psychological issues. These associations are indicated in past research, with Billings and Moos stating people with depression spend more effort regulating emotional responses to stressful events, rather than using direct problem solving techniques.<sup>31</sup> McWilliams et al found similar results, showing emotional distress was significantly negatively associated with task-oriented coping and significantly positively associated with emotion-oriented coping.<sup>19</sup> This suggests that emotion-oriented copers may benefit from support and empathy to encourage RPAH Elimination Diet compliance, while conversely task-oriented copers should be diet educated in a practical and pragmatic way. The findings of a negative correlation between avoidance and social diversion with depression is debated within research, with Turner et al supporting the study findings,<sup>18</sup> while Endler and Parker suggest depressed adults generally engage in avoidant behaviours due to their inherent self-preoccupation.<sup>32</sup> This study's findings imply avoidant behaviours (particularly social diversion) are employed to distract patients from stressful situations, diverting attention from depressive symptomatology. These patients would likely benefit from practical diet education, with tips on staying compliant.

The results show different personality traits are associated with certain coping styles. The maladaptive personality trait neuroticism was negatively correlated to task-oriented copers. This result was similarly found by Cohan et al, who additionally reported a positive correlation with agreeableness and conscientiousness.<sup>33</sup> This study

found neuroticism was positively correlated to emotion-oriented coping, which is what McWilliams et al found in concluding that less adaptive coping styles were associated with less adaptive personality traits (i.e. emotion and neuroticism).<sup>19</sup> Thus, 'above average' emotional-copers may require extra support in identifying and overcoming barriers that may seem trivial to task-oriented copers. McWilliams also concluded that neuroticism was positively correlated with depression and anxiety, a correlation not investigated in this study, but one to be considered in future research to provide a full picture of patient psychological symptoms. The results for avoidance-coping styles somewhat concur with the literature, with Cosway et al confirming the correlation with extraversion,<sup>25</sup> while links to agreeableness was not seen anywhere. This latter correlation could be by chance, however it seems a logical conclusion. In addition, the correlation between social diversion and extraversion tells us avoidance-oriented patients are sociable and this easy diversion from adherence to their prescribed diet should be considered.

High task-oriented scores in patients showed strong positive correlations to the psychological and environmental quality of life domains of the WHOQoL-Bref, characterised by clear thoughts, positive feelings, and a safe personal and work environment. Emotion-oriented copers had significantly negative correlations for psychological, social and environmental domains suggesting these patients focus negatively not only on their inner health and the environment that they live in, but also their social connections. This suggests that their RPAH Elimination Diet education should encourage the development of supportive networks. These results are not found in previous literature, which focus on overall quality of life, rather than

individual quality of life domains. Da Rocha et al found the physical domain was negatively correlated with depression,<sup>34</sup> which is something not considered in the current research. Additionally, Sainsbury et al looked at overall quality of life in the WHOQoL-Bref and found that reduced overall quality of life was related to increased psychological issues, symptom severity, and maladaptive coping styles (emotion-oriented coping).<sup>16</sup> In the study population, social diversion oriented-copers had significant correlations with social and psychological quality of life, suggesting social relationships are easy for them and their mental state is sound. These patients require little assistance to ensure that their quality of life stays high for the duration of the RPAH Elimination Diet and Challenge Protocol. The results concur with a study on Parkinson's Disease patients showing that avoidance techniques are often linked with optimism in the face of stress or sickness.<sup>35</sup>

Study limitations include potential selection bias at the recruitment stage, with low numbers of patients accepting study information. Potential influences were general nutritional interest, literacy levels, cultural backgrounds, and patients being too busy or feeling overwhelmed by the extra work required, leading to a possible bias towards 'above average' task-oriented copers. Another limitation is the self-reporting nature of the questionnaires, allowing for results to be influenced by individuals' comprehension and context of the questions, as well as intentionally omitting sensitive personal information. Subsequently questionnaires cannot be used as a diagnostic tool of psychological disorders and results should be interpreted conservatively.

This study improves our understanding of the psychological relationships seen in patients at the RPAH Allergy Unit. These links between patient coping styles, personality and quality of life are supported by the literature. Resulting recommendations are that patient education on the RPAH Elimination Diet should be tailored to the individual, considering specific coping styles and associated psychological parameters, to ultimately improve dietary adherence. Future studies investigating the roll of psychological parameters in compliance to dietary intervention, could compare psychological parameters of patients who start the RPAH Elimination Diet within two months of their initial appointment to those who drop-out or fail to implement it. It is hypothesised that people with high anxiety and 'below average' task-oriented skills may feel overwhelmed and not return for subsequent appointments, with tailoring of education potentially reducing these drop-outs. Further research could also be done to investigate the practical applications of these results in other populations on restrictive diets.

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### **Conflicts of interest**

There were no conflicts of interest.

### **Authorship**

Lisa Andersson was the primary author responsible for data collection, data analysis and writing the manuscript. Stephanie Pallas contributed to data collection and data entry. Dr Robert Loblay, Dr Anne Swain, Brooke McKinnon, Carling Chan, Kirsty Le Ray, Wendy Stuart-Smith, Neelam Pun, Amy Wu and Rajshri Roy were responsible for study design, recruitment and supervision.

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1 **Appendices:**

- 2 **Appendix I:** Screening Questionnaire and Recruitment Telephone Script, written by RPAH Allergy Unit  
3 Dietitian team.

**RPAH ALLERGY UNIT**

9-11 Layton St, Camperdown NSW 2050

P: 9515 3300 F: 9519 8420

E: [info@allergy.net.au](mailto:info@allergy.net.au)



4 (Date)

5 SCREENING QUESTIONNAIRE AND RECRUITMENT TELEPHONE SCRIPT

6 Nutritional Adequacy and Factors Influencing Dietary Compliance in Children and Adults on the RPAH

7 Elimination Diet

8 Hello \_\_\_\_\_,

9 My name is \_\_\_\_\_ and I am a student dietitian from the RPAH Allergy Unit. I am calling about  
10 your/your child's upcoming appointment at the allergy unit on (date) and (time). Are you still able to  
11 attend?

12 **Yes** / No → OK, would you like me to cancel this appointment or arrange for one of the secretaries  
13 to call you to organise another time?

14 ↓

15 Thank you. I will record that you have confirmed this appointment. I'd also like to let you know about a  
16 study we are conducting to assess the nutritional adequacy of the Elimination Diet we use for food  
17 intolerance.

18 There is no obligation for you to be involved but I can tell you more about it if you think you might be  
19 interested?

1 **Yes** / No → Thank you, that is fine. Your appointment has been confirmed and you will receive an  
 2 email with additional details. Please read this before you attend the clinic as it has important  
 3 information in it. We look forward to seeing you then.

4 ↓

5 Ok, firstly can I just ask a few details so I can tell whether you/your child qualifies for the study?

6

**Inclusion criteria** – any initial patients likely to go on  
 the Elimination Diet, i.e. those with:

Urticaria/angioedema

Eczema

Irritable bowel syndrome

Migraine

Food reactions

Symptoms suspected to be food related

7

8

9

10

**Exclusion Criteria** – anyone who has seen a dietitian at  
 the Allergy Unit previously for Food Intolerance and/or  
 has done the Elimination Diet under a dietitian's care

11

12 *What is the main reason for attendance?*

13

14



15 **Suitable** /Not suitable → From the information you have told me, it looks like the study

16

may not be suitable for you. Thank you for taking the time to

17

speaking to me. Your appointment has been confirmed and you will receive a

18

reminder email with additional details. Please read this before you attend the

19

clinic as it has important information in it. We look forward to seeing you

20

then.

21



1 It looks like the study may be suitable for you/your child. Briefly, the study will be assessing the  
2 nutritional adequacy of your/your child's diet. This will involve keeping a detailed food diary for a short  
3 period of time before your first appointment and then again on follow up. We will also be assessing  
4 general health, eating habits and quality of life which will require you to fill out some questionnaires  
5 when you attend the Allergy Unit.

6 Participation in this research is voluntary. If you don't want to take part, you don't have to. If you decide  
7 to take part and later change your mind, you're free to withdraw from the study at any stage. Whether  
8 you decide to participate or not will not affect the treatment you/your child receives, your relationship  
9 with Royal Prince Alfred hospital or those caring for you at the Allergy Unit.

10 Would you like me to post you some more information about the study?

11 **Yes** /No → Thank you, that is fine. Your appointment has been confirmed and you will receive an  
12 | email with additional details. Please read this before you attend the clinic as it has important  
13 | information in it. We look forward to seeing you then.

14 ↓  
14 Would you prefer to be sent the information by post or email? What is the best address for me to send  
15 you the information?

16 Thank you. Your appointment has been confirmed and you will receive an email with additional details.  
17 Please read this before you attend the clinic as it has important information in it. We look forward to  
18 seeing you then.

- 1 **Appendix II:** Frequency Distribution of CISS Domain t-scores of the study population (n = 97).
- 2 *a) Frequency Distribution of CISS Task t-scores. b) Frequency Distribution of CISS Emotion t-scores. c)*
- 3 *Frequency Distribution of CISS Avoidance t-scores. d) Frequency Distribution of CISS Distraction t-scores.*
- 4 *e) Frequency Distribution of CISS Social Diversion t-scores.*

