

RESEARCH ARTICLE

An examination of social group memberships in patients with eating disorders, carers, and healthy controls

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Abstract

This study compared the quantity and quality of social group memberships in patients with anorexia nervosa ($n = 30$), carers of patients with anorexia nervosa, unrelated to those patients ($n = 30$), and two cohorts of healthy controls ($n = 60$) age-matched to these focal groups. A secondary aim was to examine the associations between the quality of group relationships and severity of eating disorder and depression symptoms in patients; and depression symptoms in carers. Participants completed the online Social Identity Mapping Tool, which was used to measure the quantity and quality of social group memberships (e.g., number of social groups, number of groups rated 'highly positive'). Participants also completed self-report measures of clinical symptoms. Compared to controls, patients reported fewer social groups when eating disorder-related groups were included, and significantly fewer social groups, and community groups in particular, when eating disorder-related groups were excluded. Number of positive groups was negatively associated with severity of eating disorder and depression symptoms in patients when eating disorder-related groups were excluded. Carers reported fewer groups overall, fewer family groups, and fewer positive and supportive groups compared to healthy controls. There was a weak association between the number of positive groups and the severity of depression symptoms in carers. Positive group memberships might play a protective role towards developing more severe eating disorder and depression symptoms.

KEYWORDS

anorexia nervosa, carers, group memberships, social identity mapping

Abbreviations: BMI, Body Mass Index; DASS, Depression, Anxiety and Stress Scale; ECHOMANTRA, hybrid intervention combining "Experienced Carers Helping Others" with a module based on the "Maudsley Model of Anorexia Nervosa Treatment for Adults"; EDEQ, Eating Disorder Examination Questionnaire; NICE, National Institute for Health and Care Excellence; oSIM, online Social Identity Mapping; TRIANGLE, Transition Care in Anorexia Nervosa Through Guidance Online from Peer and Carer Expertise.

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Highlights

- Patients with anorexia nervosa reported fewer social groups than healthy peers
- Positive group membership was associated with lower eating disorder and depression symptoms in patients
- Carers reported fewer social groups than healthy peers
- Positive group membership was weakly associated with depression symptoms in carers

1 | INTRODUCTION

Social isolation is a defining feature of anorexia nervosa (McKnight & Boughton, 2009) and is considered both a precipitating and maintaining factor in the illness (Schmidt & Treasure, 2006; Treasure & Schmidt, 2013; Treasure et al., 2020). People with anorexia nervosa report an array of early negative interpersonal and lonely experiences (Cardi et al., 2018; Levine, 2012) and exhibit more solitary activities compared to healthy peers (Krug et al., 2013). Over time, people with anorexia nervosa can become both objectively and subjectively isolated (Tchanturia et al., 2013; Westwood et al., 2016) and experience severe impairments in social, leisure, and occupational functioning compared to healthy controls (Krug et al., 2013; Tchanturia et al., 2013). Patients often perceive themselves as incapable of maintaining or developing friendships (Westwood et al., 2016). Furthermore, the fear of social evaluation, in particular the fear of judgement due to weight gain, is a central feature (Levinson & Williams, 2020). In the acute state of the illness, patients display various anomalies in social-emotional processing, including increased sensitivity to social threats, demonstrated by attention biases towards rejection and social-rank related facial expressions (Cardi et al., 2013, 2014) and biased interpretations of ambiguous social information (Cardi, Turton, et al., 2017). Patients also perceive more coldness from others and tend to respond coldly even to feedback that they perceive as warm (Ambwani et al., 2016). These anomalies may derive in part from predisposing traits (Kothari et al., 2015) and may also manifest as a consequence of starvation on brain function (Oldershaw et al., 2010).

Carers (such as family members or partners) of people with an eating disorder can also become isolated (Coomber & King, 2013; Raenker et al., 2013; Sepulveda et al., 2012), due to the time and emotional resources invested into caregiving (Raenker et al., 2013). Carers of people with an eating disorder seem to have poorer social functioning than carers of other illnesses (Linacre et al., 2015). This is concerning because carers with a

stronger social support network appear to experience less distress and eating disorder-specific carer burden (Dimitropoulos et al., 2008; Raenker et al., 2013). Indeed, the Maudsley Model of Anorexia Treatment for Adults (MANTRA) encourages carers to preserve and expand their own social connections (Schmidt et al., 2018).

Studies investigating the social networks of patients with eating disorders and their carers have primarily relied on the use of self-report questionnaires (Leonidas & dos Santos, 2014). These have limited ecological validity and might be inadequate in capturing the richness and complexity of social group membership and their psychological relevance (Ashmore et al., 2004; Leach et al., 2008). The Social Identity Mapping procedure was developed to assess the composition and perceived quality of relationships with multiple group memberships (Cruwys, Steffens, et al., 2016) and has been adapted into an online version (Bentley et al., 2020). The Online Social Identity Mapping Tool (oSIM) assesses both quantity and perceived quality of group relationships. Perceived quality of group relationships has been operationalised in terms of several aspects of group membership, including the number of *positive* groups (i.e., the number of groups rated as 8+ on a 10 point scale in terms of positivity), the number of *representative* groups (i.e., the number of groups where a person rated 8+ out of 10 that they 'fit' what it means to be a member of the group), and the number of *supportive* groups (i.e., the number of groups rated as 8+ on a 10 point scale in terms of the social support received from other group members).

Various aspects of social group memberships have been associated with measures of wellbeing, including greater life satisfaction, greater self-esteem and lower depression in various community samples of students, new parents, retirees, and also in adults with anxiety or depression (Bentley et al., 2020; Cruwys et al., 2013, 2016, 2020; Haslam et al., 2019). Furthermore, in adults attending residential treatment for addiction who completed an adapted version of the oSIM for Addiction Recovery, better recovery outcomes were associated with a decrease in the proportion of 'high risk' groups, that is, those consisting

primarily of heavy substance users, and an increase in the proportion of 'low risk' groups, which consisted primarily of non-users, people in recovery, and/or members' whose substance use was unknown (Beckwith et al., 2019).

Patients with anorexia nervosa may also have so-called 'high risk' groups as part of their social network. These groups might form in the context of treatment programs and can increase illness-related comparison and competition among patients. Indeed, the National Institute for Health and Care Excellence (NICE) warn of potential harms of institutionalisation from inpatient care, in part because such environments can enable the formation of detrimental relationships between patients (National Institute for Health and Care Excellence, 2017). However, patients motivated to recover can facilitate the development of groups based on a shared *recovery identity* which can promote treatment engagement (Kendal et al., 2017; Malmendier-Muehlschlegel et al., 2016; McNamara & Parsons, 2016). Similarly, eating-disorder related group memberships can form online and have been broadly categorised into two communities: those which promote the illness and those which promote recovery (Eikey & Booth, 2017; Wang et al., 2018). Some groups explicitly designed to promote recovery are led by professionals and include moderated online forums and published recovery narratives. There are also communities led by non-professionals which can promote illness or recovery, such as blogs, unmoderated online forums, and accounts created on social media platforms. However, qualitative studies have highlighted that even groups designed to support recovery could inadvertently serve to maintain the illness depending on patients' stage of illness and motivation for treatment (Drtilova et al., 2021; Smahelova et al., 2020). Further information about the impact of belonging to eating disorder-related groups is needed to inform clinical interventions (Bachner-Melman et al., 2018).

This study aimed to compare the quantity and quality of social groups within the social networks of patients with anorexia nervosa, carers of patients with anorexia nervosa, and age-matched healthy controls using the oSIM, and to examine associations between the perceived quality of group relationships, eating disorder symptoms, and depression symptoms in patients, and depression symptoms in carers. Based on prior evidence of social isolation in patients with eating disorders and carers, and findings from previous studies using the oSIM, we hypothesised that:

1. Patients with anorexia nervosa and carers would report fewer social groups and fewer positive groups, representative groups, and supportive groups compared to healthy controls.

2. The number of positive, supportive and/or representative groups would be negatively associated with the severity of eating disorder symptoms and depression symptoms in patients, and the severity of depression symptoms in carers.

Although it was beyond the remit of this study to objectively establish the positive or negative impact of eating disorder related groups, we tested our hypotheses both with, and without eating disorder-related groups included in the social identity maps of patients.

2 | METHODS

2.1 | Participants

One hundred and twenty participants were recruited, including patients with anorexia nervosa ($n = 30$), carers of patients with anorexia nervosa unrelated to patient participants in this study ($n = 30$), and two groups of age-matched healthy controls: participants aged 18–30 ($n = 30$), who were the comparison group for patients, and participants aged 45 or above ($n = 30$), who were the comparison group for carers. Patients with anorexia nervosa and carers were recruited as part of the ongoing multi-centre clinical research trial, TRIANGLE (IRAS: 197114, ISRCTN: 14644379; Cardi, Ambwani, et al., 2017) via NHS and private inpatient and day care units across the UK. Inclusion criteria for patients included being aged 16 or over, having a diagnosis of anorexia nervosa (all participants received a diagnosis provided by a clinician before admission), receiving inpatient or day care (or discharged within 4 weeks), a BMI ≤ 18.5 upon admission, with a carer willing to participate and internet access. Patients were excluded if they had a chronic medical or psychiatric comorbidity requiring separate specialist treatment (e.g., diabetes mellitus, psychosis, cystic fibrosis) or if they were pregnant. Carers were included providing they were caring for a relative or friend with an eating disorder. Inclusion criteria for healthy controls included being aged 16 or over, internet access, with no self-reported current or previous psychiatric diagnosis, or currently providing care for someone with a chronic psychiatric disorder. The study was advertised for healthy controls through two advertisements on King's College London's research volunteer circular, with each advert targeting a specific age group (18–35 and ≤ 45) to match with the patient and carer samples. Participants completed the Depression, Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1995) and Eating Disorder Examination Questionnaire (EDEQ; Fairburn & Beglin, 1994) to assess the severity of eating

disorder and depression symptoms. Healthy controls were included in the sample if they scored less than sixty on the total score of the DASS-21. The recruitment of patients with anorexia nervosa and carers was approved by Camberwell St Giles Research Ethics Committee (16/LO/1377). The recruitment of healthy controls was approved by the Psychiatry, Nursing and Midwifery Research Ethics Subcommittee (HR-19/20-14718). All participants completed the study before the Covid-19 pandemic.

2.2 | Measures

2.2.1 | Demographics

Participants provided their gender, age, highest education level achieved, ethnic background and relationship status.

2.2.2 | DASS (Lovibond & Lovibond, 1995)

The DASS-21 is a self-report questionnaire of 21 items designed to measure symptoms of depression, anxiety and stress. The subscales can be summed to provide a total distress score. In the present study, the reliability of DASS-21 was high overall ($\alpha = 0.96$) and for each of the subscales: Depression ($\alpha = 0.95$), Anxiety ($\alpha = 0.88$) and Stress ($\alpha = 0.92$).

2.2.3 | EDE-Q (Fairburn & Beglin, 1994)

The EDE-Q is a self-report questionnaire with 36 items designed to measure the frequency of specific eating disorder psychopathology. The questionnaire provides subscale measures of restraint, eating, weight and shape concern, as well as a global score. In the present study, the reliability of EDE-Q was high for the global scale ($\alpha = 0.97$) and for each of the subscales: Restraint ($\alpha = 0.83$), Eating Concern ($\alpha = 0.87$), Weight Concern ($\alpha = 0.90$) and Shape Concern ($\alpha = 0.96$).

2.2.4 | oSIM (Bentley et al., 2020)

The oSIM is a virtual tool used to visually represent the individual's social network (an example of a social map is provided in Figure 1). An additional step was added to the original procedure which involved all participants first creating a box to represent their individual self, labelled 'Me'. This was followed by the creation of boxes to represent their social groups. Participants could name

each group (e.g., 'family'; 'friends') and were asked to indicate the importance of each group by changing the group size (small, medium or large). Participants answered three questions about each group on Likert scales including (a) the extent to which they felt positive about belonging to each group (from 1 'not at all positive' to 10 'very positive'), (b) the extent to which they felt representative of their groups (from 1 'do not fit in at all' to 10 'fit in extremely well'), and (c) the extent to which they perceived the group as supportive of their wellbeing (from 1 'not at all' to 10 'very much'). The Number of Total Groups, Family Groups and Community groups (defined as friendships or groups different from a Family group) was calculated. The number of positive groups, supportive groups and representative groups were calculated for each participant by summing the number of groups scored at 8, 9 or 10 on each of the three Likert scales (Bentley et al., 2020; Cruwys et al., 2016) and then again, excluding the eating disorder-related groups.

2.3 | Procedure

Patients and carers were approached by staff involved in facilitating the TRIANGLE Trial recruitment at participating inpatient or day care eating disorder units in the UK. Patients were screened against the inclusion and exclusion criteria and consented in person. Patients completed the questionnaires via the TRIANGLE trial website. The healthy control group received an electronic copy of the information sheet, consent form and questionnaire via Qualtrics software (Qualtrics Provo UT, 2020). All participants were provided with the link to the social map tool <https://sign.azurewebsites.net/welcome/triangle>, including guidance for completing the oSIM from the researcher over the telephone or the link to a YouTube walkthrough video. Patients were reimbursed as part of the TRIANGLE trial and healthy controls received a £5 voucher for their participation.

2.4 | Statistical analyses

To assess between-group differences in demographic variables, independent-sample *t*-tests and chi square tests were applied. Independent samples *t*-tests were also used to compare groups on all variables. Bonferroni adjustments were applied for multiple comparisons. Patients with anorexia nervosa and healthy controls aged 18–35 were compared on the group quantity and quality variables and the total score on the DASS. Carers were compared to healthy controls aged 40–77. Bootstrapping of 1000 samples was performed for the independent

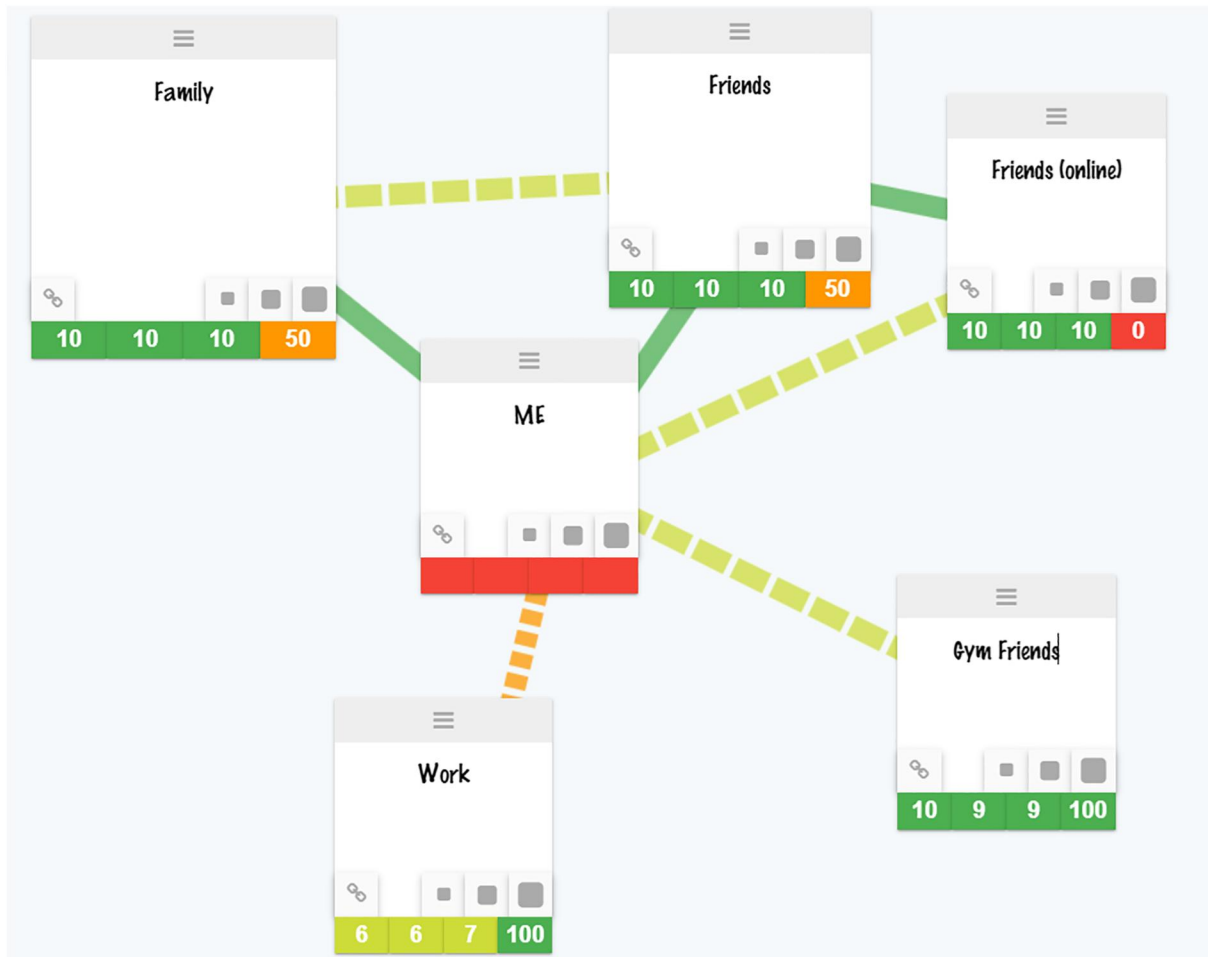


FIGURE 1 An example of a social identity map. The size of the square represents perceived group importance (large = very important, medium = medium importance, small = low importance); the solid green lines represent very good quality relationships; dashed green lines represent good quality relationships; numbers represent Likert scale scores on the quality of relationship variables (group positivity, group representativeness, group supportiveness) [Colour figure can be viewed at wileyonlinelibrary.com]

samples *t*-tests and correlation analyses. Pearson's *r* (2-tailed) correlations were used to explore associations between the social group variables, eating disorder symptoms, and depression symptoms in patients with anorexia nervosa (with and without eating disorder-related groups included) and depression symptoms in carers. Cohen's *d* effect sizes were calculated for all between-group differences, and the effect sizes of correlations were interpreted as small ($d = 0.1\text{--}0.3$, $r < 0.24$), medium ($d = 0.3\text{--}0.5$, $r > 0.24$), or large ($d = 0.5\text{--}1.0$, $r > 0.37$).

3 | RESULTS

Demographic and clinical variables are presented in Table 1. Patients with anorexia nervosa were similar in age to healthy controls. However, patients with anorexia nervosa were all White British, were more likely to have

an undergraduate (rather than postgraduate) university degree as their highest level of education and were less likely to have a romantic partner than healthy controls. Patients with anorexia nervosa had an average duration of illness of 5.50 years ($SD = 3.08$) and an average BMI of 16.19 ($SD = 2.23$). Carers were made up of mothers ($n = 23$), fathers ($n = 2$), and male partners ($n = 3$). Carers and healthy controls did not significantly differ in age. However, carers of patients with anorexia nervosa were all White British and were more likely to have a romantic partner. As anticipated, patients with anorexia nervosa reported significantly greater severity of eating disorder symptoms, as well as depression, anxiety and stress symptoms than the age-matched healthy controls. Carers reported significantly greater depression and stress symptoms than the age-matched healthy controls. Half of patients (15/30) reported belonging to between 1 and 4 eating disorder-related groups in their social map.

TABLE 1 Demographic and clinical characteristics of patients with anorexia nervosa, carers, and healthy controls

Participant group	AN (n = 30)			Carers (n = 30)		
	M (SD) or n (%)	HCs (n = 30)	Test statistic	M (SD) or n (%)	HCs (n = 30)	Test statistic
Age	23.47 (3.09)	24.93 (3.39)	$t(58) = -1.75$, $p = 0.085$	54.10 (4.84)	54.17 (8.36)	$t(47) = -0.038$, $p = 0.970$
Gender			$X^2 = 2.31$, $p = 0.254$			$X^2 = 1.93$, $p = 0.267$
Female	28 (93.3)	24 (80)		23 (76.7)	18 (60)	
Male	2 (6.7)	6 (20)		7 (23.3)	12 (40)	
Ethnic group			$X^2(3, n = 60)$ $= 13.47$, $p < 0.001$			$X^2(3, n = 60)$ $= 13.47$, $p < 0.001$
White British	30 (100)	19 (63.3)		30 (100)	19 (63.3)	
Asian British	0 (0)	5 (16.7)		0 (0)	9 (30)	
Black British	0 (0)	1 (3.33)		0 (0)	1 (3.33)	
Mixed ethnic groups	0 (0)	5 (16.7)		0 (0)	0 (0)	
Other	0 (0)	0 (0)		0 (0)	1 (3.33)	
Highest level of education			$X^2(6, n = 60)$ $= 13.73$, $p = 0.013$			$X^2(6, n = 60)$ $= 9.54$, $p = 0.071$
No qualifications	2 (6.7)	0 (0)		4 (13.3)	0 (0)	
O Level/GCSE	3 (10)	1 (3.3)		4 (13.3)	2 (6.67)	
A Level/NVQ	7 (23.3)	4 (13.3)		4 (13.3)	4 (13.3)	
Diploma/BTEC	5 (16.7)	7 (6.7)		4 (13.3)	6 (20)	
University degree	10 (33.3)	8 (26.67)		11 (36.7)	8 (26.67)	
Postgraduate degree	3 (10)	12 (40)		3 (10)	9 (30)	
Other	0 (0)	3 (10)		0 (0)	1 (3.33)	
Relationship status			$X^2 = 9.64$, $p = 0.002$			$X^2 = 4.81$, $p = 0.03$
Partner	8 (26.6)	20 (66.67)		27 (90)	20 (66.67)	
No partner	22 (73.33)	10 (33.33)		3 (10)	10 (33.33)	
DASS depression subscale	26 (12.07)	7.53 (6.86)	$t(46) = 8.74$, $p < 0.001$, $d = 1.88$	11.07 (9.67)	4.27 (5.14)	$t(44) = 3.40$, $p < 0.001$, $d = 0.88$
DASS anxiety subscale	15.53 (8.83)	3.53 (5.62)	$t(49) = 6.28$, $p < 0.001$, $d = 1.62$	4.33 (4.93)	1.60 (3.21)	$t(50) = 2.55$, $p = 0.014$, $d = 0.66$
DASS stress subscale	24.40 (9.09)	9.27 (6.90)	$t(58) = 7.27$, $p < 0.001$, $d = 1.87$	16.40 (9.65)	6.13 (6.68)	$t(58) = 4.79$, $p < 0.001$, $d = 1.24$
EDEQ global subscale	3.02 (1.28)	1.41 (1.24)	$t(58) = 4.93$, $p < 0.001$, $d = 1.27$		1.85 (1.09)	

Note: $p < 0.05$.

Abbreviations: AN, anorexia nervosa; DASS, Depression, Anxiety and Stress Scale; EDEQ, Eating Disorder Examination Questionnaire; HC, healthy controls.

TABLE 2 Quantity and quality of social groups in patients with AN versus HCs, and carers versus HCs

	AN	HCs	<i>t</i>	<i>p</i> Value	Cohens <i>d</i>	Carers	HCs	<i>t</i>	<i>p</i> Value	Cohens <i>d</i>
Number of total groups	5.60 (2.59)	6.50 (2.01)	1.50	0.139	0.39	5.03 (2.85)	6.67 (2.50)	2.36	0.021	0.61
	4.90 (2.58) ^a		2.68	0.010*	0.69					
Number of community groups	4.23 (2.50)	5.33 (1.79)	1.96	0.055	0.51	3.80 (2.58)	3.13 (1.74)	1.64	0.105	0.42
	3.53 (2.42) ^a		3.28	0.002*	0.85					
Number of family groups	1.43 (0.73)	1.17 (0.70)	1.45	0.153	0.37	1.20 (0.66)	1.80 (1.09)	2.56	0.014*	0.66
Number of groups rated highly positive	3.00 (2.26)	3.43 (1.92)	-0.80	0.427	0.21	3.57 (2.18)	4.83 (2.17)	2.26	0.028	0.58
	2.73 (1.91) ^a		-1.41	0.163	0.37					
Number of groups rated highly supportive	2.60 (1.63)	2.63 (1.61)	-0.08	0.937	0.02	2.77 (1.43)	3.93 (2.08)	2.53	0.014*	0.65
	2.20 (1.37) ^a		1.12	0.266	0.29					
Number of groups rated highly representative	1.83 (1.74)	2.00 (1.17)	0.43	0.666	0.11	2.90 (2.09)	3.50 (2.03)	1.13	0.264	0.29
	1.63 (1.52) ^a		1.05	0.300	0.27					

Note: * $p < 0.02$. Bonferroni adjusted alpha level of 0.02 was used for independent samples *t*-tests.

Abbreviations: AN, anorexia nervosa; DASS, Depression, Anxiety and Stress Scale; EDEQ, Eating Disorder Examination Questionnaire; HC, healthy controls.

^aExcludes eating disorder-related groups, such as therapy groups.

3.1 | Perceived group relationships in patients with anorexia nervosa, carers of patients with anorexia nervosa, and age-matched healthy controls

As shown in Table 2, when eating disorder-related groups were included, patients reported fewer groups in total (medium effect size), fewer community groups (large effect size) and a greater number of family groups (medium effect size) compared to healthy controls. Patients also reported slightly fewer positive, supportive, and representative groups compared to healthy controls (small effect sizes). When eating disorder-related groups were excluded, patients reported significantly fewer groups in total and fewer community groups (large effect sizes) compared to healthy controls. Patients also rated fewer groups as highly positive (medium effect size). Slight differences remained in the number of supportive and representative groups reported by patients compared to healthy controls (small effect sizes).

Carers reported fewer groups overall (large effect size), fewer community groups (medium effect size) and fewer family groups compared to healthy controls (large effect size). Interestingly, 13% carers reported belonging to 1 or 2 eating disorder carer support groups, which were included in the community groups category. Carers reported significantly fewer positive and supportive groups compared to healthy controls (large effect sizes), but only slightly fewer representative groups (small effect size).

3.2 | Associations between perceived group relationships and clinical symptoms in patients with anorexia nervosa and carers of patients with anorexia nervosa

In patients, when eating disorder-related groups were included, correlations were small between the severity of eating disorder symptoms and the number of groups in total ($r = -0.13$), number of positive groups ($r = -0.31$), supportive groups ($r = -0.14$), and representative groups ($r = -0.15$). Correlations were also small between depression symptoms and the number of groups in total ($r = -0.04$), number of positive groups ($r = -0.04$), number of supportive groups ($r = -0.07$), and the number of representative groups ($r = -0.10$). When the eating disorder-related groups were excluded, correlations remained small between the severity of eating disorder symptoms and the number of groups in total ($r = -0.15$), supportive groups ($r = -0.18$), and representative groups ($r = -0.19$) but large for the number of positive groups ($r = -0.42$). Consistently, correlations were small between the severity of depression symptoms and the number of groups in total ($r = -0.18$), number of supportive groups ($r = -0.29$), and number of representative groups ($r = -0.19$) but large for number of positive groups ($r = -0.37$).

In carers, there were small correlations between the severity of depression symptoms and the number of groups in total ($r = -0.15$), positive groups ($r = -0.08$), supportive groups ($r = 0.03$) and representative groups ($r = 0.02$).

4 | DISCUSSION

The first aim of this study was to examine the quantity and quality of social group memberships in patients with anorexia nervosa, and carers of patients with anorexia nervosa, compared to age-matched healthy controls using the oSIM. In line with our first hypothesis, patients with anorexia nervosa reported belonging to fewer social groups overall and fewer community groups, compared to healthy controls, even when eating disorder-related groups were included. As expected, the difference was greater when eating disorder-related groups were excluded. These findings align with previous work indicating greater social isolation among people with eating disorders (Fox & Diab, 2015; Krug et al., 2013; Stewart, 2004; Tchanturia et al., 2013; Westwood et al., 2016).

Whilst the patients in this study reported severe impairment within their work and social lives and were less likely to have a romantic partner than healthy controls, surprisingly, there were no pronounced differences in the number of positive, representative and supportive social groups compared to healthy controls, and there were only subtle differences with the removal of eating disorder-related groups. It is possible that the quality of relationships with social groups may be less impaired than other aspects of social functioning (i.e., employment and having a romantic partner). The findings that the carers in this study reported fewer social groups than healthy controls, and fewer positive and supportive social groups, aligns with previous evidence for substantial social isolation among carers of people with eating disorders (Coomber & King, 2013; Raenker et al., 2013; Sepulveda et al., 2012).

A secondary aim was to examine the associations between quality of group relationships and the severity of eating disorder symptoms, and depression symptoms in patients and depression symptoms in carers. When eating disorder-related groups were excluded, patients with more severe eating disorder symptoms and depression symptoms tended to have fewer positive groups. These findings align with evidence demonstrating associations between greater perceptions of alienation from one's mother and peer groups and the severity of eating disorder symptoms and depression comorbidity (Pelletier Brochu et al., 2018). Contrary to our hypothesis, depression symptoms in carers were not associated with the number of positive groups. It is possible that unmeasured factors such as the level of burden and coping strategies may have had a more dominant effect (Coomber & King, 2012).

Overall, these findings highlight the potential clinical value of interventions focused on improving social functioning in young adults with anorexia nervosa. For example, increasing positive perceptions of social group

memberships might play a protective role towards developing more severe eating disorder and depression symptoms over time through increasing social connection with these groups (Treasure et al., 2020). However, the impact of belonging to eating disorder-related groups on wellbeing and the course of anorexia nervosa over time requires further investigation.

The finding that carers of patients with anorexia nervosa report belonging to fewer groups than their healthy peers suggests that some of these carers may benefit from interventions to increase social belonging. Indeed, the effectiveness of social prescribing in unpaid carers has been identified as a key research recommendation in the NICE guidelines for supporting adult carers (Larkin, 2020).

4.1 | Strengths and limitations

One strength of this study is the use of the social identity mapping procedure to assess social group memberships in a clinical sample of patients with eating disorders and carers. Our findings build on previous studies which have primarily relied upon self-report questionnaires to assess social networks in these focal groups (Leonidas & dos Santos, 2014). Another strength of this study is the inclusion of control groups to compare with the patient and carer samples.

However, there are a number of limitations to consider when interpreting the findings. First, the study was underpowered, with statistically small sample sizes for each participant group. It is possible that significant associations could not be identified for this reason. Nonetheless, this study gives an indication of how people with anorexia nervosa, and carers of people with anorexia nervosa, perceive the quantity and quality of their social group memberships overall. A related limitation is that the participants may not be highly representative of the populations of interest. Patients with anorexia nervosa were recruited from across the UK and had all been admitted to hospital for inpatient or intensive day care treatment. Healthy controls were primarily recruited from a London university (King's College London), which is likely to have contributed to the highly educated and diverse sample recruited. The carer sample were predominantly mothers, and we did not collect information about the parental status of the healthy controls. It is possible that parenthood per se could have influenced some of the differences found between the social networks of carers and healthy controls (Rözer et al., 2017). Furthermore, twelve patients and twelve carers were receiving an online intervention ('ECHO-MANTRA') as part of their participation in the

TRIANGLE Trial, which encourages participants to optimise social support. It is possible that participants who had engaged with this intervention felt more connected to their social network than those who had not.

There are also some limitations related to the study design. For example, the study relied upon self-report measures of clinical symptoms which are less reliable than standardized assessment procedures. A more comprehensive clinical assessment and the collection of additional data relevant to social functioning may have provided a more detailed insight into the relationship between social group memberships and clinical symptoms. For example, we did not collect specific information about patients' diagnoses (i.e. sub-types of anorexia nervosa), treatment history (e.g., duration), or living circumstances outside of the hospital environment. These factors may contribute to perceptions of social group memberships overall. Moreover, we did not collect detailed information from patients about the positive and negative impacts of belonging to eating disorder-related groups in particular, or patients' perspectives on the meaning and utility of categorising these groups as 'high risk' or 'low risk' to their wellbeing. Finally, as the study used a cross-sectional design it is not possible to infer causal relationships between the social group variables and clinical symptoms assessed in this study.

5 | CONCLUSION

Patients with anorexia nervosa in this study reported fewer social group memberships compared to healthy controls, even when including eating disorder-related groups were included as part of their social network. Whilst there were no pronounced differences in quality of relationships with these groups compared to healthy controls, when eating disorder-related groups were excluded, the number of positive groups was negatively associated with the severity of eating disorder and depression symptoms. Carers reported fewer social group memberships and fewer positive and supportive groups than healthy controls. However, the quality of group relationships was weakly associated with the severity of depression symptoms in carers. Given the evidence for the protective role of social group memberships (Cruwys et al., 2013; Haslam et al., 2019), these findings suggest that supporting patients to develop and maintain positive group membership in the community, that are unrelated to their eating disorder, may help to reduce eating disorder symptoms, and improve mental health more generally. However, longitudinal studies are needed to explore the direction of these relationships, and to further explore the types of eating disorder-related groups and

whether these have a primarily positive or negative influence on clinical symptoms and course of anorexia nervosa. For example, following Beckwith et al. (2019), these groups might be classified as 'high risk' or 'low risk' of harm to patient wellbeing. Similarly, in carers, further research is needed to investigate whether social group memberships may be protective of wellbeing over time. Overall, the findings of this study suggest that social group relationships with a non-eating disorder focus are compromised among patients with anorexia nervosa and carers. Given the widely established protective role of social group memberships, future research is warranted to investigate whether interventions that seek to bolster these relationships have clinical benefit.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Data will be available upon reasonable request to the corresponding author.

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