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Personal wellbeing networks, social capital and severe mental illness: findings from an exploratory study

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Title:

Personal wellbeing networks, social capital and severe mental illness: findings from an exploratory study

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Abstract

Background; Connectedness is a central dimension of personal recovery from severe mental illness (SMI). Research reports lower social capital and poor quality social networks compared to general population.

Aim; To identify personal wellbeing network (PWN) types and explore added insights from mapping place and activity alongside social ties.

Method; 150 interviews with individuals with SMI mapped social ties, places and activities and their wellbeing impact. PWN types were developed using social network analysis and hierarchical k-means clustering of this data.

Results; Three PWN types were identified: Formal and Sparse, Family and Stable, Diverse and Active. Wellbeing and social capital varied across and between types. Place and activity data indicated important contextual differences within social connections not found by mapping social networks alone.

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Conclusion; Place locations and meaningful activities are important aspects of people's social worlds. Mapped alongside social networks, PWNs have important practice implications for person-centred recovery approaches by providing a broader understanding of individual's lives and resources.

Declaration of interest. None.

Introduction

Since de-institutionalisation and the emergence of community care as the policy and therapeutic support framework for people with mental health problems in many countries, there has been an interest in social networks; the social ties and relationships that link people together.[1,2,3] Studies have reported that people with Severe Mental Illness (SMI) have smaller and poorer quality networks than the general population,[4] providing lower access to social support[5] and lower access to social capital.[6] There have long been concerns about loneliness and social isolation, impacting on both poor mental health and opportunities for personal recovery.[7] Central to improving outcomes are addressing physical health needs[8], reducing stigma and discrimination,[9] and providing services that are person centred and strengths based as articulated by recovery focused practice values.[10]   Social relationships have been identified as key agents of change in resource-orientated therapeutic models,[11] while recent research conceptualising personal recovery has emphasised the importance of connectedness and meaningful activities.[12] This paper explores how our understanding of connectedness and wellbeing can be expanded by extending social network analysis to include connections to places and activities as well as people.

Methods

<u>Study design</u>

A 30 month mixed-methods study collected largely descriptive data to explore wellbeing, social capital and network structure, in two sites; an inner city London Borough; an area of the South West (SW) of England.[13] Ethical review was provided by Central London Research Ethics Committee 4. A Public and Patient Involvement (PPI) group of six mental health service users supported the study throughout.

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<u>Participants</u>

People were recruited through primary care, supplemented by secondary care. There were nine participating surgeries in London and six in the SW. The Quality Outcome Framework (QOF) mental health registers were used to identify eligible participants who were sent letters by their primary care surgery (n=713). The study inclusion criteria were:

- Primary diagnosis schizophrenia, bipolar or other psychoses (severe depression with psychosis, delusional disorder schizoaffective disorder);

- Aged 16-65;

- In contact with primary or secondary care for support of their mental health for at least 2 years;

- English speaker.

Second stage recruitment involved contacting potential participants through secondary community mental health teams who approached clients they deemed eligible using packs provided by the research team (n=154). The same eligibility criteria applied, with one addition: people had to be registered with a general practitioner (GP) to participate.

Expressions of interest were returned by post (n=207, 29%): 165 via primary care; 33 via secondary care; 9 were unknown. The study team screened to confirm diagnosis by telephone: 17 did not meet study criteria, 18 withdrew consent to participate, five could not be contacted, eight did not attend interviews, and two lacked capacity to give full informed consent. Finally seven people were excluded at analysis stage because of excessive missing network data (n=57 excluded). The final study population included 150 people; 75 from each site.

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Data collection tools

The study collected egocentric network data for people, places and activities; the name generator approach was selected[14] with no limit on number of contacts that could be mentioned to provide maximum potential diversity in networks. A bespoke Personal Wellbeing Network (PWN) mapping schedule was developed using one to one consultations with 29 people with SMI to produce a pilot measure. A three-stage iterative pilot with 12 participants with SMI recruited from several mental health resource centres run by a third sector provider refined the tool. The final draft was piloted by members of the PPI group. Piloting improved face validity and minimised cognitive load through development of visual data collection procedures, improved interview ordering, and managing interview length by dropping unnecessary questions.

The PWN mapping tool included open-ended name generator questions mapping all social ties, meaningful activities/hobbies and place connections which participants currently and regularly (as defined by participant) interacted with and which they felt impacted on wellbeing[13]. Cards for each person, place or activity mapped were also completed with attribute data, such as frequency and duration of connection. Closeness maps were drawn by participants to indicate which social ties they were emotionally closer to. On the same maps structural social network data was collected by drawing alter-alter ties (social ties that know each other) and interconnections between social ties, places and activities were also recorded on cards. The resulting network was conceptualised as an egocentric multi-level personal wellbeing network inclusive of both close and weak ties. Data was also collected on: wellbeing, via both the self-rated impact of each network connection and the Short Warwick Edinburgh Mental Wellbeing Scale (SWEMWS),[15] social capital using the Resource Generator UK (RG-UK)[16] current physical and social functional statuses, including perceived social support, using CO-OP Dartmouth Scales.[17]

Network data were analysed using UCINET for Windows, Version 6 and IBM SPSS Statistics for Windows Version 21.0.

A network typology approach was used with reference to other mental health studies[18] in order to assess how places and meaningful activities combine to provide a context for how social networks are configured. This allowed for an examination of patterns in connectedness.

48 PWN variables from social tie, place and activity data were used to develop network types, reduced from 61 by removing highly correlated variables.[13] These variables included types of connection (e.g. number of each relationship, activity and place type), frequency of connection, duration of connections, self-rated impact of each connection and emotional closeness to social ties. Social network density was also included. Agglomerative clustering – iterative creation of clusters of variables which occurred together in the dataset - produced three clusters across the 150 case dataset, which were explored descriptively and named by examining characteristics for commonalities within each cluster. Finally, K-means clustering was used to assign individual participants to the cluster they fitted closest.

Differences across network in access to social capital, wellbeing, employment status, age, gender, diagnosis, and mental health service use were assessed. Finally, to assess how social capital resources were accessed within these PWNs and how reliant participants were on practitioners for these resources, a linear regression was performed on the log-transformed variable for the mean percentage of social capital

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resources accessed from health and social care practitioners. The RG-UK includes data on which relationships social capital is accessed from. For this study, a column was added for practitioners. The dependent variable for this regression was calculated by dividing the total resources accessed from practitioners from the total number of resources accessed from all relationship, and was log transformed due to non-normal distribution.

Results

The study participants were a cohort of people with SMI registered with a GP (see Table 1). They were not a representative sample but a heterogeneous group including 31% non-White British, 57% male, with a mean age of 46; 15% in full time employment, 14% in part time employment, with 39% receiving mental health support entirely through primary care.

 Table 1 about here

Personal wellbeing networks

Three PWN types were described in the study cohort. Table 2 summarises significant differences between these types in social tie, place and activity data, while Table 1 identifies significant differences in participant characteristics.

A 'Formal and Sparse' network type was assigned to 31.3% of participants, describing a cluster of variables which, compared to the other two types, contained fewer social ties with a higher proportion of practitioner contacts, more time spent at home, fewer community place connections and lower engagement in meaningful activities. This

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network type included participants who were significantly older and more likely to be: male rather than female, on long-term sickness/disability, have a diagnosis of schizophrenia/psychotic disorder, managed in secondary rather than primary care.

'Family and Stable' network types were found in 32% of participants, with relatively higher numbers of family and friend relationships, describing more emotionally close and stable social ties. These participants spent most of their waking time at home but also had a number of community place connections and engagement in meaningful activities. This network type included the highest proportion of: female participants; White British participants; people with a diagnosis of Bipolar Disorder/Manic Episodes; people in full and part time employment; and the highest proportion of primary care only mental health management.

'Diverse and Active' network types were identified in 36.7% of participants, with more social ties overall than the other two PWNs and more diversity in relationship type including higher numbers of weak ties, such as colleagues, acquaintances and neighbours. These participants spent less waking time at home, connected to more community places and engaged in higher numbers of meaningful and social activities compared to people with the other two types. People with Diverse and Active networks were significantly younger, with higher levels of education/training qualifications and volunteering experience.

Table 2 shows the variation within as well as across these three network types; there is overlap between the number and type of social tie, place and activity connections participants have recorded. For example, the smallest two Diverse and Active networks both had 9 social ties, while the largest Formal and Sparse network had 30. In this Formal and Sparse network, formal practitioner ties comprised 11 of the 30 social

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relationships while the participant connected to fewer places and engaged in fewer activities, none of which were social. The social ties of both participants in the Diverse and Active network type with 9 social ties were primarily friends and wider contacts such as acquaintances or colleagues and both had higher than average connections to community places and engagement in meaningful activities. The combination of activity and place variables with social tie data impacts on the resulting network cluster description.

Table 2 about here

Health, wellbeing and PWN satisfaction

Differences in mental wellbeing (SWEMWBS) scores were small but significantly different across network types as shown in Table 3, with mean wellbeing scores lower in the Formal and Sparse and highest in the Diverse and Active. Wellbeing scores varied within each network type for example, a range of 7 to 30 in Family and Stable networks.

Quality of Life as measured in the CO OP Dartmouth scales did not differ significantly across network types and also showed high variation within each type. Quality of life was related positively to wellbeing score (r=.643, *p*<.001). Self-rated overall health did significantly differ across network types and was lowest in the Formal and Sparse type and highest in the Diverse and Active type. Access to social support was significantly different across types with the highest social support found in family and stable networks, and similar scores in the other two types.

Despite differences across network types in these measures, participant satisfaction with their current wellbeing network was on the whole positive, and did not

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significantly differ across network type. Higher satisfaction was associated with having more friends (r=0.37, *p*=0.01), family (r=0.19*, p*=0.02) and practitioners (r=0.21, *p*<0.01) but not wider contacts. It was also positively correlated with wellbeing (r=0.36, *p*<.001) quality of life (r=0.41, *p*<0.001), social support (r=0.37, *p*=<0.001) and overall health (r=0.33, *p*<0.001).

Participants were also asked to rate the impact of their connections on their own wellbeing. The majority of social ties and place connections were rated positively and this did not differ significantly across types, however participants with Formal and Sparse networks rated a significantly lower proportion of their activities/hobbies as positively impacting wellbeing compared to the other two types.

Table 3 about here

Role of practitioners in networks

We identified network differences by care setting and experiences of inpatient admission (see Table 1). Significantly higher primary care mental health management was found in participants with family and stable networks, and those participants had fewer reported psychiatric inpatient admissions, while those with formal and sparse types had higher levels of secondary care contact.

General practitioner, mental health and social care professionals were present in 97.8% of PWNs and 22.7% of participants placed a practitioner in their inner circle of emotional closeness on their closeness maps. While this did not differ significantly across network type, we did find that where a practitioner first appeared on the

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closeness map differed significantly. On average the first mentioned practitioner was closest in Diverse and Active networks and least close in Family and Stable networks (F(2,147)=4.10, p=.02).

Access to social capital resources

Access to social capital variations (see table 3) were found not only in levels of social capital, but also in the sources of provision. On average significantly higher proportion of resources were accessed from colleagues by those with Diverse and Active (8.5%) than those with Family and Stable (5.5%) or Formal and Sparse (2.7%) network types (F(2,147)=3.064, *p*=.05). In addition, a significantly higher mean percentage of social capital resources were accessed from practitioners by those with a Formal and Sparse network (18.3%) than those with Diverse and Active (10%) or those with Family and Stable (2.8%) (F(2,147)=9.299, *p*<.001). No significant differences in access to social capital resources from immediate family, wider family, friends, neighbours or acquaintances were found.

A higher proportion of social capital accessed from practitioners was correlated with lower amounts of social capital overall (r=-.231, *p*<.001). Thus we examined which participants had highest reliance on practitioners for social capital. Significant differences are reported in Table 4; 35.8% of variance was explained by the model which showed that non-white British participants, those with no formal education, less stable (temporary) housing , in secondary care and on long-term sickness or disability accessed significantly higher proportions of social capital from practitioners F(2,99)=6.156, p<.001. Age, diagnosis, network type, years since last admission, overall RG UK score and SWEMWBS score were not significant. This model is summarised in

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table 5. Indicators of disadvantage, rather than PWN variables, were significant in explaining variance in reliance on practitioners for social capital resources.

Table 4 about here

Table 5 about here

Contextual impact of adding place and activity data to social networks

Social network diagrams for this study were produced using social tie data alone and then with place and activity information (see figures 1 and 2). Firstly, a Formal and Sparse network type is presented (see Figure 1a). The social network is small with primarily social ties as neighbours and mental health professionals. The person appears to be socially isolated. With the addition of place and activity in figure 1b, some context is provided. Home is a dominant space where most of waking time is spent and where most activities take place. There are no regular visitors to the home. If practitioners examined the network for potential opportunities for growth and development, there are places, such as the gym or park linked to activities (keeping fit and walking) that provide starting points for network development conversations. In figure 2, a Diverse and Active network type is presented. The social network in 2a has a variety of connections. The addition of place and activity in 2b provides context to these relationships, highlighting the importance of volunteering and football as routes through which a large and diverse social network has been built.

Figures 1 and 2 about here

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Discussion

The Personal Wellbeing Network approach

This study presents a methodological variation to social network mapping and aims to include place and activity dimensions to mental health recovery and connectedness discussions. Most mental health social network studies to date have focused primarily on the number of social contacts available to people with SMI[18], linking social relationships with level of social support, and assessing them for associations such as between numbers of social contacts and hospitalisation.[2] The varying methods used, make comparisons difficult and normative estimates may be inappropriate; the ideal network size for any individual is likely to depend on a range of factors that change over time. This study offers evidence for expanding the concept of 'social network' in recovery-oriented research by considering important places and activities as dimensions because people can feel connected to them and use them to manage wellbeing, levering opportunities to address social isolation and loneliness. This study offers empirical support for the importance of place location and meaningful activity as key dimensions of person centred recovery.[11]

The cluster analysis identified three distinct network types within the study population. Similar to other studies, PWNs can be used to plan potential interventions.[19] The clusters (types) of network identified in this study are unique because they include place and activity data that provide contextual depth to the social networks mapped. A few other studies have also clustered types based on social network data alone, [20,21] describing typologies in relation to isolation – socially isolated individuals, groups and locally isolated individuals[20] from a residential housing estate in London and more similar to our analysis - family, friend, diverse and restricted network types from a

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general population study of elders (aged over 60) in America.[21]Both of these studies suggest network analysis can support service delivery providing practical benefits.

A key finding was the heterogeneity of PWNs mapped.[13] For example, the study found diagnosis was not significant in explaining the variance in these types, but rather formal education, housing status, whether participants were living alone or not, and being on long-term sickness or disability, significantly explained variation in network type. PWN mapping does allow a comparison of outcomes across types to identify participants who have potentially different care needs based on the composition and quality of their connections. It is also important to emphasise that there was great variation within the three types, both in connectedness and in wellbeing. Mapping an individual's PWN could support person-centred approaches, both for understanding individuals' decisions and generating coproduced plans for changing networks in ways that enhance recovery and wellbeing. This attention to context is supported by long term condition management literature emphasising the importance of social networks for understanding processes of self-care and chronic illness management taking place in open systems across the community. [22]

Despite the consistent findings that the social networks of people with SMI are smaller and of poorer quality than the general population, social network development is not promoted directly in NICE clinical guidelines. The Connecting People Intervention as well as research on volunteering, personal budgets and employment is building the case for a greater focus on the social in psychiatry.[23, 24] The study has shown that aspects of place and activity significantly impact variance in social network size, and in access to social capital, within a population of people with the diagnosis of severe mental illness.[13]

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Social Capital Access and practitioner roles

Social capital has been defined by several authors as the resources embedded in social networks, emphasising the importance of network members' resources such as power, wealth, knowledge, skills and influence, to an individual.[25] The study observed the vital role played by practitioners in PWNs. Practitioners are involved in all network types and provide some important resource access for people with SMI albeit at low levels. Diverse and active networks placed practitioner relationships nearer to them in terms of emotional closeness, consistent with research on recovery exploring how strong therapeutic alliances are vital[26]. The study found for people experiencing higher disadvantage such as unstable housing and no formal education, practitioners were key sources of social capital, particularly bonding and bridging connections[6], despite overall providing less resources than other relationship types. Without practitioners some people with SMI would have extremely limited access to social capital. People with formal and sparse networks, where practitioners were a key feature, tended to have lower overall health scores, and a lower proportion of their activities generating wellbeing. The results suggest that people who are more reliant on practitioners for social capital tend to have fewer other sources of resource available to them, regardless of network type. This is reflected not just in smaller social networks, but in place connections which are dominated by mental health service settings and in a lack of engagement in meaningful activity. This group has other disadvantages identified by the regression result; structural disadvantages found might make network development more challenging but also suggest this is a priority group for social interventions. These participants had lower overall social capital: practitioners were not replacing the resources that would be provided by a more extensive social network, and replacement would be less sustainable than supporting people to develop their own networks through engagement in meaningful activities and community place connections.

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Mapping PWNs may offer the clinician potential to work with individuals to understand how connections developed and how they impact wellbeing, as well as plan for future changes; identifying potential 'build blocks' for network growth.[13] Considering wellbeing rating data alongside visual network diagrams may also support individualised clinical decisions in relation to therapeutic resource allocation; who needs greater practitioner support or less and to achieve which social and clinical goals? Wellbeing network mapping offers up clues for how people integrate different aspects of identity with managing SMI, and opens up conversations to empower and generate hope which is consistent with recovery focused practice, placing the individual at the centre of this process. Like traditional diagnostic models, wellbeing mapping could provide a potential framework for allocating clinical resources to support recovery journeys.

Wellbeing and SMI

Wellbeing is an important public health indicator and enhancement of wellbeing is a goal of many programmes seeking to improve quality of life. Research has shown populations with chronic health problems such as SMI can have high levels of wellbeing[27]. Less is known how to enhance wellbeing where it is lacking. This study approached the assessment of wellbeing in two ways: first using the SWEMWBS[15] and secondly self-report wellbeing ratings for all contacts to people, places and activities. Compared to mean SWEMWBS population data for the general public in England (25.3)[28], levels of wellbeing in the sample were lower however it is the variation within network types that is important.

Our network approach was conceptualised as a PWN because participants were asked to identify connections that were important to their wellbeing during the mapping process and because during consultations, participants found wellbeing to be the most useful

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and best understood term to encompass a sense of mental and physical health. The study found self-reported wellbeing ratings of connections to be on the whole positive. Participants tended to value the connections they had even where they were limited or difficult.[12] A self-rated wellbeing rating is necessarily subjective and limited, but understanding wellbeing perceptions could be useful for practitioners in helping individuals to identify where they perceive barriers to network development. Using this approach we also identified that a diverse array of places and activities were important to the wellbeing of different people, supporting a personalised approach to network interventions, rather than a one-size-fits-all view that emphasises more social ties being better for everyone: for some, engagement in meaningful activity and addressing barriers to community place connection could be more beneficial for their recovery. The finding in the study that wellbeing varied within and between network types also supports this observation; diverse and active networks could be stressful to maintain, while family and stable networks offered support but also presented conflicts in familial relationships. This is consistent with research that shows people with a diagnosis of severe mental illness can have few social contacts but not feel lonely.[29]

Study Limitations

The pilot study did not contain a representative sample of people with SMI and only worked in two study locations. Another sample may have led to different network typologies being produced. The important finding is not only the three PWN types that were identified, but also how this mapping approach can identify different wellbeing networks by describing relevant differences that may be clinically useful to supporting recovery and person centred planning. The study did not look at change over time in PWNs or on-line versus off-line connections; this would be a recommendation for further research as well as collecting clinical outcome data.

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Name generator approaches to social network mapping have been criticised for being too costly and time intensive to administer. Adding place and activity adds to participant interview load. Any network study has to define boundaries through the careful selection of questions. In the pilot, name generation was based on eliciting all the contacts which supported wellbeing; the maps revealed more positive than negative or neutral activity and place connections. Further work to refine questioning to elicit negative ties is needed.

Finally, it is important to acknowledge how network typology studies do produce overlap in network types identified. These are not definitive categories, rather they are useful groupings that help explore network data. The three types are relative to each other –relatively diverse, relatively sparse – and mapping in different samples may produce a different number of types with different key features, although consistency between our study and others was noticeable[21].

Implications for policy

The study was designed against a policy background seeking solutions to major mental health challenges: parity of esteem between mental health physical health with a large excess mortality gap for people with SMI; persistent barriers to recovery fuelled by stigma and discrimination; service reconfigurations particularly the discharge of people with SMI from secondary to primary care with concerns about the capacity of GPs to provide specialist mental health support. The PWN approach was thus influenced by research on wellbeing, recovery, physical health inequalities, social exclusion, social capital and social support, using a social network framework. The findings suggest that a broader approach to social network mapping might provide some routes forward for

mental health professionals when assessing how to intervene and help support change in social networks. Identifying individuals who are particularly reliant on practitioners for social resources might be a useful strategy for prioritising individuals who may benefit from network development support. Further work is needed to assess whether PWNs might offer up a practice intervention for supporting the delivery recovery focused practice and improved outcomes.

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Table 1: Participant characteristics

Variable	Difference across network type	Formal & sparse Type (n=47)	Family & Stable Type (n=48)	Diverse & Active Type (n=55)	Study population (n=150)
Study site (%)					
London	χ^2=21.69, p<.001	42.6	22.9	67.3	50
South West	(df=2)	57.4	77.1	32.7	50
Mean age in years (S.D, range)	F= 126.30, p=.02 (df=149)	48.7 (9.5, 21-63)	47.8 (11.1, 24-64)	42.9 (12.7, 19-65)	46.3 (11.5, 19- 65)
Gender (%)					
Male	χ^2=7.08, p=.702	61.7	54.2	54.5	56.7
Female	(df=2)	38.3	45.8	45.5	43.3
Ethnicity (%)	χ^2= 8.59, p=.014				
White British	(df=2)	61.7	85.4	61.8	69.3
Other		38.3	14.6	38.2	30.7
Diagnosis group (%)					
Schizophrenia/psychotic disorder		51.1	20.8	45.5	39.3
Bipolar disorder/manic episodes	χ^2= 14.18, p=.007 (df=4)	31.9	64.6	34.5	43.3
Other psychoses		17.0	14.6	20	17.3
Employment [participants could tick more than one status] (%)					
Full time work	F=3.32, p=.039	4.3	20.8	20.0	15.3
Part time work	F=1.72, p=.184	6.4	18.8	16.4	14.0
Education/training	F=4.89, p=.009	4.3	0	14.5	6.7
Volunteering	F=2.612, p=.077	6.4	6.3	18.2	10.7
Long-term sickness/disability	F=8.321, p<.001	57.4	29.2	21.8	35.3
Unemployed	F=.419, p=.659	19.1	12.5	14.5	15.3
Looking after family/home	F=.928, p=.397	2.1	6.3	1.8	3.3
Retired	F=.246, p=.783	8.5	12.5	9.1	10.0
Current service contact for mental health (%)	χ^2= 7.66, p=.022 (df=2)	27.7	54.2	34.5	38.7
Primary Care Secondary Care		72.3	45.8	65.5	61.7
% participants who have been a psychiatric inpatient	χ^2= 7.63, p=.022 (df=2)	85.1	68.8	89.1	81.3
Mean years since last psychiatric inpatient admission (S.D., range)	F=.283, p=.754 (df=114)	8.1 (6.8, 0-28)	8.9 (7.2, 0-24)	9.5 (9.8, 1-37)	8.9 (8.2, 0-37)
Mean years since first contact with services for mental health condition (S.D., range)	F=1.673, p=.191 (df=149)	22.0 (11.4, 1-45)	20.9 (11.4, 0-44)	17.9 (12.1, 1-44)	20.1 (11.7, 0-45)

Table 2: Summary network characteristics across network type

Variable	Difference across network type (df=149)	Formal & sparse Type (n=47)	Family & Stable Type (n=48)	Diverse & Active Type (n=55)	Full study population (n=150)
Mean social network size (S.D., range)	$F=25.21$, $p<.001$	12.4 (5.6, 5-30)	22.7 (9.1, 10-56)	23.9 (10.6, 9-64)	19.9 (5.6,5-64)
Mean % family ties	$F=24.57$, $p<.001$	29.8	37.9	22.2	29.1
Mean % friends	$F=13.19$, $p<.001$	26.6	34.4	33.9	32.7
Mean % wider ties	$F=17.01$, $p<.001$	12.1	16.3	25.5	19.6
Mean % practitioners	$F=7.19$, $p=.001$	31.5	11.5	18.4	18.6
Mean number of regular place connections (range, S.D.)	$F=14.73$, $p<.001$	6.4 (2.1, 3-12)	9.5 (4.0, 2-20)	9.8 (3.6, 2-19)	9.7 (3.7, 3-21)
Mean % community setting	$F=26.72$, $p<.001$	56.2	73.7	70.4	67.8
Mean % Mental health settings	$F=8.28$, $p<.001$	14.0	5.2	8.1	8.0
Mean % Physical health settings	$F=13.26$, $p<.001$	31.2	21.0	21.4	23
Waking time spent at home (%)					
0-25%		2.1	8.3	14.5	8.7
26-50%	$\chi^2=27.83$,	12.8	18.8	41.8	25.3
51-75%	$p<.001$	31.9	39.6	30.9	34
76-100%	(df= 6)	53.2	33.3	12.7	32
Mean number of regular meaningful activities (S.D., range)	$F=15.90$, $p<.001$	4.6 (2.3, 1-12)	6.8 (3.0, 1-15)	7.5 (2.8, 3-16)	6.4 (3.0, 1-16)
Mean % structured activities	$F=20.23$, $p<.001$	69.7	93.9	87.0	83.9
Mean % social activities	$F=13.65$, $p<.001$	24.6	46.2	50.3	40.9

Table 3: Social Capital, Wellbeing, functioning and satisfaction across network types

Variable	Differences across network type	Formal & sparse Type (n=47)	Family & Stable Type (n=48)	Diverse & Active Type (n=55)	Full study population (n=150)
Total RG-UK score (S.D., range)	$F(2,148)=24.962$, $p<.001$	9.5 (5.9, 0-23)	17.4 (5.2, 5-27)	15.5 (6.0, 1-25)	14.2 (6.6, 0-27)
Domestic resources sub-scale (S.D., range)	$F(2,148)=21.462$, $p<.001$	2.5 (1.9, 0-6)	4.9 (1.5, 2-7)	4.0 (2.0, 0-7)	3.8 (2.0, 0-7)
Expert advice sub-scale (S.D., range)	$F(2,148)=18.808$, $p<.001$	3.1 (2.2, 0-8)	5.6 (2.4, 1-9)	5.7 (2.4, 0-9)	4.8 (2.6, 0-9)
Personal skills sub-scale (S.D., range)	$F(2,148)=14.491$, $p<.001$	1.8 (1.5, 0-5)	3.5 (1.7, 0-6)	2.8 (1.6, 0-6)	2.7 (1.7, 0-6)
Problem solving sub-scale (S.D., range)	$F(2,148)=14.043$, $p<.001$	2.0 (1.5, 0-5)	3.3 (1.2, 1-5)	3.3 (1.3, 0-5)	2.9 (1.4, 0-5)
Mean SWEMWBS score (S.D., range)	$F(2,148)= 3.923$, $p=.022$	20.4 (6.0, 8-34)	23.0 (5.3, 7-30)	23.4 (5.6, 9-35)	22.3 (5.7, 7-35)
Mean CO-OP Self Rated Quality of Life score (S.D., range)	$F(2,149)=1.25$,, $p=.291$	2.0 (.9 0-4)	1.7 (.9, 0-4)	1.7 (1.0, 0-4)	1.8 (.9, 0-4)
Mean CO-OP Self Rated Overall Health Score (S.D., range)	$F(2,149)=3.34.$ $p=.038$	2.5 (1.1, 0-4)	2.0 (1.1, 0-4)	1.9 (1.2, 0-4)	2.1 (1.2, 0-4)
Mean CO-OP Self-Rated Access to Social Support Score (S.D., range)	$F(2,149)=9.087$, $p<.001$	2.4 (1.4 0-4)	1.4 (1.4, 0-4)	2.4 (1.4, 0-4)	1.7 (1.4, 0-4)
Participant satisfaction with current PWN (%)	$X^2= 4.650$, df=4, $p=.325$				
Very or Quite Satisfied		61.7	75.0	76.4	71.3
Neither satisfied nor dissatisfied		21.3	8.3	10.9	13.3
Very or quite dissatisfied		17.0	16.7	12.7	15.3
Connections rated as positively impacting wellbeing (%)					
Social ties	$F(2,146)=.953$, $p=.388$	60.7	65.3	66.0	64.1
Places	$F(2,146)=1.835$, $p=.163$	60.7	57.1	65.9	61.4
Activities	$F(2,146)=5.091$, $p=.007$	71.7	85.3	84.2	80.7

*CO-OP scores: lower scores= better functioning (e.g. better quality of life)

Table 4: Differences in access to social capital resources from health and social care practitioners

Variable	Mean % social capital accessed from health & social care practitioners
Network type (F=9.299, df=147, p<.0001)	
Formal and sparse (n=47)	18.3
Family and stable (n=48)	2.8
Diverse and active (n=55)	10.0
Ethnicity (T=2.05, df=146, p=.043)	
White British (n=102)	8.3
Other (n=46)	14.8
Years since last admission (data available for 115 participants only)(F=20.56, df=112, p=.220)	
0-2 (n=31)	17.9
3-6 (n=30)	9.6
7-14 (n=28)	7.6
15-37 (n=26)	12.8
Mental health contact type (T=3.408, df=146, p<.001)	
Primary care (n=57)	4.0
Secondary care (n=91)	14.2
Employment (T=2.610, df=146, p<.001)	
Working full time (n=23)	1.3
Other (n=127)	11.9
Diagnosis (F=7.541, df=147, p<.001)	
Schizophrenia/psychotic disorder (n=59)	17.2
Bipolar disorder/manic episodes (n=65)	5.2
Other psychoses (n=26)	7.6
Education (T=4.394, df=146, p<.001)	
No formal education (16)	28.2
Other (132)	8.1
Age (F=2.79, df=144, p=.043)	
19-38 (n=39)	9.7
39-48 (n=42)	10.1
49-55 (n=29)	18.2
56-65 (n=40)	5.5
Gender (T=-.564, df=146, p=.574)	
Male (n=84)	9.3
Female(n=64)	11.0
Housing (F=11.029, df=147, p<.001)	
Ownership (n=39)	2.7
Renting (n=89)	10.0
Temporary/unstable n=24)	23.6
Wellbeing (SWEMWBS) score (t=.763, df=145, p=.447)	
Higher wellbeing – 23-35 (n=79)	11.5
Lower wellbeing – 7-22 (n=71)	9.2

Table 5: Variance in percentage of social capital resources accessed from practitioners: multiple regression result

Adjusted R square: .358 (35.8% of variance explained)

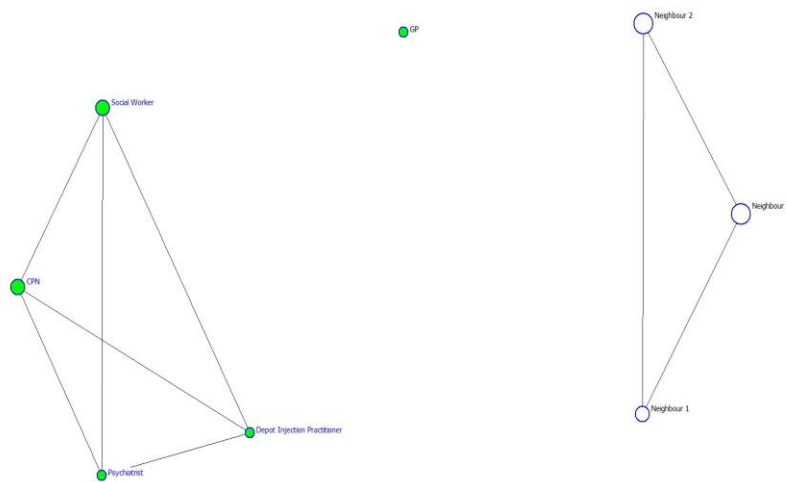| Significant independent variables	Coefficient (standard error)	t-value	P-value
Ethnicity (White British or not)	-.229 (.259)	2.896	.005
Formal education (Yes or no)	.211 (.374)	2.514	.014
Housing (Ownership, renting, other)	.216 (.232)	2.332	.022
MH contact (primary/secondary)	.292 (.127)	3.224	.002
Long-term sickness/disability (Yes/no)	.240 (.294)	2.633	.01

Personal Wellbeing Network diagram key

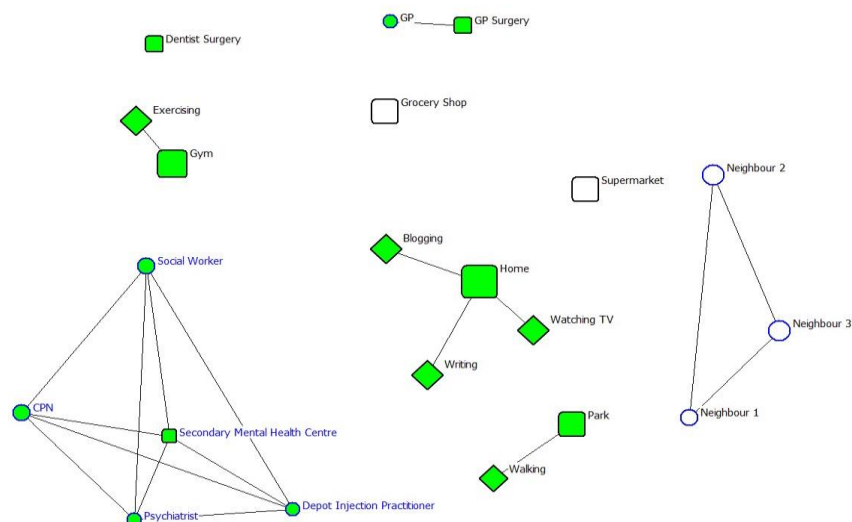| Indicator	Variable	Levels
Size of node	Frequency of contact	Larger: more frequent
Shape of node	Type of node	Circle: person, Square: place, Triangle: Activity
Colour of node	Wellbeing impact	White: neutral Green: positive Red: negative
Colour of node label	Mental health network	Black: non - mental health network Blue: mental health network
Colour of node rim	Knowledge of participant mental health condition	Blue: knows about mental health condition Black: does not know
Note: Unlike traditional sociograms the participant (ego) is not included. This is for visual clarity when place and activity are combined: the participant is connected to every node in the diagrams. The people only diagrams exclude ego for consistency.		

Figure 1: Comparison of social network (people only) with personal wellbeing network (People, place and activity connections) for a Formal and Sparse network type [7 social ties

SUL07: 48 year old Indian male, long-term sickness, schizophrenia.
8 social ties, SWEMWBS score = 23, RGUK score = 11
Network satisfaction = Neither satisfied nor dissatisfied
3 words used to describe network: Reliable, Safe, Zero-chaos
Percentage of social capital from practitioners: 72.7%

1a

1b

Figure 2: Comparison of social network (people only) with personal wellbeing network (People. Place and activity connections) for a Diverse and Active network type

SW33: 44 year old White British male, volunteering, schizophrenia
28 social ties, SWEMWBS score= 28, RGUK score= 20
Network satisfaction: Very satisfied
Three words used to describe network: Learning process very good, very helpful, very happy in the system
Percentage of social capital from practitioners: 20%

2a

2b