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RESEARCH ARTICLE

Social Network Analysis of Dementia Wards in Psychiatric Hospitals to Explore the Advancement of Personhood in Patients with Alzheimer's Disease

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Abstract: ***Background*:** Little is known on investigating how healthcare teams in dementia wards act for promoting personhood in persons with Alzheimer's disease (PWA).

***Objective*:** The current research aimed to identify the social networks of dementia health carers promoting the personhood of PWA in acute or long-term dementia wards in public and private psychiatric hospitals.

***Methods*:** We used a mixed-method research approach. Ethnographic observations and two-mode Social Network Analysis (SNA) captured the role and social networks of healthcare professionals promoting PWA personhood, using SocNetv version 2.4. The social network graphs illustrated how professionals participated in PWA care by computing the degree of centrality (%DC) for each professional; higher values indicated more statistical significance of a professional role compared to others in the provision of personhood care. The categories of personhood were biological, individual, and sociologic. Nurses, doctors, ward managers, hospital managers, clinical psychologists, occupational therapists, care coordinators, physiotherapists, healthcare assistants, and family members were observed if they were promoting PWA personhood.

***Results*:** The highest %DC in SNA in biological personhood was held by the ward nurses (36%), followed by the ward doctors (20%) and ward managers (20%). All professional roles were involved in 16% of cases in the promotion of individual personhood, while the hospital managers had the highest %DC (33%) followed by the ward managers and nurses (27%) in the sociologic personhood.

***Conclusion*:** All professional roles were deemed to promote PWA personhood in dementia wards, although some limitation exists according to the context of the assessment.

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1. INTRODUCTION

This current study illustrates how Social Network Analysis (SNA) can capture health carers network promoting patient personhood in persons with Alzheimer's disease (PWA) resident in dementia wards in public and private psychiatric hospitals in the United Kingdom (UK). Research predicts that 850,000 people in the UK will develop dementia by 2021, amounting to 1% of the population [1]. People with dementia occupy 25% of hospital beds and stay in the hospital longer than people without dementia; nonetheless, the hospital stay can negatively impact on the physical health of the person [2, 3]. In the policy paper of the United Kingdom Prime Minister, it is reported that more than 1 million people have been 'trained to be dementia friends with over 400,000 National Health Service staff been trained to support people with dementia together with 100,000 social carers' [4, 5]. Alzheimer's disease accounts for about 50% of all dementias, followed by vascular dementia (10-15%), mixed (10-15%) and other forms of dementia (up to 100%) [6].

1.1. Challenges in Dementia Care

The major challenge for dementia health carers and their PWA is to face cognitive impairments in dementia impacting everyday life and adding additional anxiety and hardship both to patients and their carers [7]. The NICE (National Institute for Health Care Excellence, 2018) [8] indicates four points for improving cognition in PWA: i) 'cognitive rehabilitation' as a set of tasks to reinforce activities of daily living while strengthening strategies to balance impairments, ii) 'cognitive stimulation' exposing PWA to individual and group tasks to improve intellectual and social skills, and iii) 'cognitive training' as exposure to particular cognitive tasks within an array of complexity.

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Hence, the major tasks of healthcare professionals working with PWA are to implement remedial actions to slow down their cognitive and social impairment and by exposing PWA to a series of task-oriented activities. Other studies moving to this direction mention the importance of the stimulation of the Default Mode Network (DMN) which is considered as the activated brain in resting state anatomically linked to a network inclusive of the posterior cingulate cortex, precuneus, medial frontal cortex, and bilateral inferior parietal and posterior temporal areas and being linked to social cognition [9]. The research group from De Marco *et al*. utilized computer-based cognitive skills which kindled DMN by exposing PWA to cognitive actions involving different neurocognitive tasks [10]. Neuroanatomical investigations provided evidence of significant associations between task performance and grey-matter volume of multiple DMN core regions which are progressively affected by Alzheimer's disease [11].

Cognitive stimulation requires joint effort of different dementia health carers. In fact, due to the complexity of PWA cognitive, social and physical demands it can occur that several dementia health carers synchronously (all together at the same time) or asynchronously (individually on shared goals) can address one particular need (*e.g*., nurses and doctors in a hospital) or, instead, only one professional attends to multiple aspects and needs in the same patient (*e.g*., a home carer). Besides, a collaborative practice can be both intraprofessionals supported by the collaboration of professionals with the same role, or interprofessional where different professionals (*e.g*., doctors, nurses, social workers) collaborate to address PWA needs [12]. Cognitive and social stimulation and activation all belong to the corpus of activities meant to promote patient's personhood as herein described.

1.2. Personhood and Collaborative Care

The concept of personhood considers a person with Alzheimer as individual who has identities that are not only biological but also psychological, social, historical, moral, religious, legal, financial, and civil [13]. The Oxford Online Dictionary defines personhood as 'The quality or condition of being a person' [14]. The Stanford Encyclopaedia of Philosophy online reports that 'personhood' answers the questions 'What is to be a person?' and 'What is necessary to count as a person?' [15]. Hence the personhood of a PWA is promoted by recognizing how is the world for persons with dementia, to realize the circumstances they find themselves in, and to interpret the world how they understand it [16]. Kitwood defines personhood as the meaning or importance that is conferred to a person by others in the setting of a connection and bond [17]. When addressing multiple needs in PWA, dementia carers usually refer to PWA's personhood which comprises three critical domains: 'biological, individual and sociologic personhood' [18]. Specifically, personhood is reinforced when the biological and physical conditions for PWA are optimal; when individual personhood incorporates the personal ideals, historical responsibilities, and the individual and is sustained by communication with staff; sociologic personhood is strengthened by community relations, positions, association to organizations and so on [18].

Therefore, the promotion of personhood and cognitive stimulation and activation all require the participation of diverse experts (*e.g*., nurses, doctors, psychologists, physiotherapists, healthcare assistants, and other healthcare professionals) each one with the know-how necessary to attend to the multifaceted aspects of Alzheimer's disease [19, 20]. World Health Organization defines collaborative practice as the activity of several healthcare professionals from diverse specializations who collaborate to deliver wide-ranging services to convey the best treatment to common patients [21]. Most of the times such collaboration entails that health carers in interprofessional teams can address several needs in PWA according to an integrated care plan which is discussed and approved during multidisciplinary team meetings. Hence, PWA require a complex array of specialist support from different professionals addressing multiple needs like pain, feeding and hydration, medication, bladder and bowel activity, activities of daily living, self-care, prevention of falls, mobilization, posture, *etc*. [22]. The authors of the current study suggest that making a patient autonomous on these skills belongs to a process of cognitive and social stimulation and rehabilitation. Alzheimer's disease also presents with multiple psychological and behavioral symptoms which include 'disinhibited behavior, delusions, hallucinations, anxiety, depression or mania, and sleep disturbances' [23]. NICE suggests actions to promote PWA awareness, self-sufficiency, and comfort, for instance with groups sections, group reminiscence, occupational therapy, managing agitation and aggression, dealing with anxiety and depression, dealing with multiple physical needs [24].

Hence, to meet this increased demand for dementia care, policymakers suggest reinforcing team expertise, interprofessional trust, and the understanding of care by helping staff to focus on shared healthcare pathways [25-28]. The National Institute for Health and Care Excellence (NICE) sustains that carers' participation is more successful when offered as team actions [24]. Furthermore, outcome measures help to personalize care pathways and support patient care by improving the cohesiveness of the team [29, 30]. Additionally, to make sure that PWA gain entirely from the participation of different experts, dementia care leaders need to have clear reasons and the prerequisites for a specific specialized contribution and what demands will be addressed [31]. Social and cognitive stimulation and rehabilitation can improve through constant behavioral observation of the outcomes in PWA care and setting goals in the treatment they receive [32]. Nonetheless, due to the complexity of tasks needed for the activation of cognitive and social skills in PWA, efforts of dementia health carers should be coordinated, while performing different actions for the promotion of patients personhood in a climate of mutual acceptance, self-reflection, transformation, and search for novel options in patient care [25]. Hence, to improve patient's safety and quality of life, it is crucial that each member of the team can work according to a shared care plan while adopting genuine friendliness, care and involvement with a patient, creating a calming environment and deference for the patient regardless of his or her physical and mental condition [33]. Furthermore, care plans to improve personhood should involve family members, friends and others linked to the PWA, including all the carers [34].

Patients in the advanced stages of illness still require cognitive stimulation comprising multifaceted actions to address complex needs like encouraging food and fluid intake, changing of incontinence pads, helping patients in washing and dressing, monitoring the risk of falls, improving sleep pattern, reducing day sedation, and regular physical check [35]. Multidisciplinary effort and care skills remain paramount for addressing diverse needs and patient personhood while patient-centered care entails different levels of coordinated actions addressed to PWA [36]. For instance, in organizations defined by Kitwood as type B, there is shared participation in dementia care and teamwork of people whose ideas are united and whose skills are released in attaining a mutual aim [17]. Also, centeredness is based on collective accountability about the care of a PWA along with a common understanding of the kind of support to be provided and an emphasis on the intricate link between self, patients, and families [36]. Hence, there is an increased benefit to the patient and patient care when health workers are coordinated in their efforts by sharing a common care plan [26].

1.3. Social Network Analysis

One way to investigate the social network of dementia health carers into PWA wards in psychiatric hospitals is the use of Social Network Analysis (SNA). SNA started from the studies of Moreno and Jennings who developed two methods, 'sociometry' representing the quantitative method for understanding the behaviour of groups of people and the role persons play in the group, and 'sociograms' that capture the pictorial configuration of individuals in the groups and their relationships with other persons in the social network [37]. Characteristics of social networks are 'nodes' that represent units or persons that interact with each other *via* some form of 'ties' or with a specific category of activity [37, 38]. These interactions can be illustrated in the social network graph. In a two-mode matrix there are two sets of nodes that interact whereas, in the one-mode, nodes refer to the same category (Fig. **1**) [39].

In the two-mode network, the research is interested in knowing who is doing what regarding a target action, for instance, which category of healthcare professionals use certain skills in patient care. Therefore, in the two-mode networks, there are two diverse categories of nodes and the ties occur only within these two different nodes (*e.g.*, Person×Action) but not within the same category of nodes which is instead present in the one-mode networks (*e.g.*, Person×Person) [38]. For instance, in the two-mode network, the researcher can illustrate that some professional roles are involved more than others in attending to specific patients' needs. The configuration of the network is represented by a set of nodes or actors and the events they attend hence generating an 'incidence matrix' which provides the outcome of Actors × Events cross-matching [37] The relationships between nodes in a social network are illustrated by arrows going from one actor to another actor or category (as in the two mode-matrix) [38] (Fig. **1**). An outgoing arrow starts from the actor/node that is initiating the action, information or relationship towards an actor/node which is receiving the information, action, relationship; in this case the arrowhead will point to the ingoing actor; in case the relationship is reciprocal the arrows are ingoing/outgoing between the two nodes with arrowheads pointing to both actors [39]. SNA can be designed by asking the actors to identify a category of interest for the research conducted (*e.g.*, the most liked coworker or the most liked brand of a product) [40].

A concept in SNA is that of centrality regarding 'contribution the node makes to the structure of a network' [41]. For instance, if some healthcare professionals are more frequently involved in some form of personhood in PWA, they have a more central role compared to their colleagues that perform less frequently the targeted clinical skill. In this case, it is reported that some individuals are more centralized than others who occupy a more peripheral position concerning a target parameter [42]. Hence, with the visual analysis of the social network, researchers can assess who occupies a core or central position in the network, and who, instead is at the periphery of it [43]. Moreover, as in the example of healthcare professionals performing some skills, in 'degree

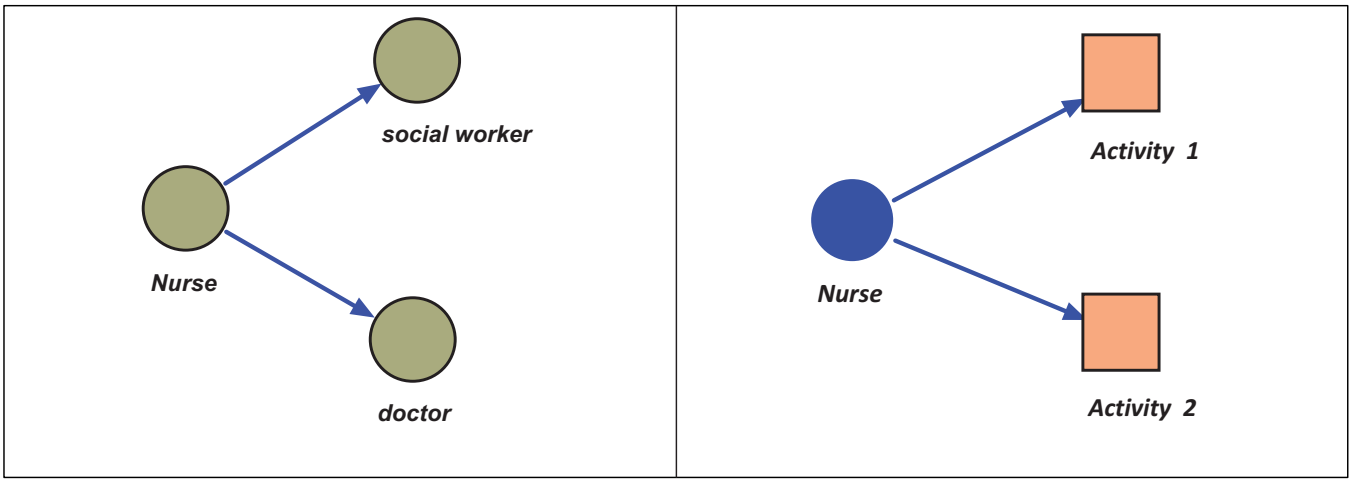

Fig. (1). One-mode (left) and two-mode (right) social network. In the one-mode reported, there are three actors while the nurse interacts with the other two members of staff. In the two-mode network, the links connect a nurse to two activities. The one-mode is linked to the same category of actors while in the two-mode, actors of the social network perform some activity; hence there are two categories of nodes.

centrality' the SNA counts and provides a visual account of how many ties are directed from one person/node to a targeted action *via* network ties and with a factor called 'outdegree' [44] (Fig. **2**). Other two major qualities of a network are a 'core' where nodes are strongly linked and a 'periphery' where there are fewer ties within each other or with other nodes in the network [45]. SNA can be used for endorsing transformations within healthcare organizations [46]. Furthermore, not only SNA explores collateral influences among social units or nodes but also the contribution of each social unit as an entity and as a group of participants [47].

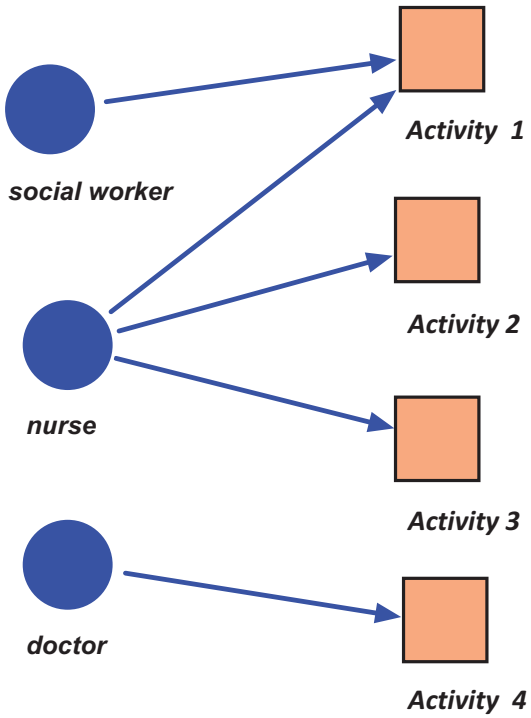

Fig. (2). Example of a two-mode (two-nodes) social network where each professional is linked to one or more activities. In the figure, the nurse occupies a more central position because s/he is performing more activities compared to the social worker and doctor who are only attending to one task each.

1.4. Ethnographic Research

To collect data for SNA, observational studies can provide some insight into how actors perform in a social network. For instance, as most of the actions for PWA care are implemented as visible behaviors, their occurrence can be flagged by ethnographic observational research [48]. The advantage of ethnographic research is that it can classify behaviors that cannot be anticipated by the existing studies [48]. Besides, ethnography provides detailed and up-to-date explanations collected through extended observations and exchanges with the target population in their setting, with the opportunity to test the vigor of hypotheses by using extended site visits [49]. Also, ethnography illustrates the common interpretation of what is essential and significant to the people under observation [50]. With a researcher as a participant observer, during ethnographic research, it is possible an expert assessment of a target behavior by a person who becomes the member and thus participant of the setting under investigation [51]. Ultimately, ethnography reduces the bias of standard survey questionnaires in which conflicts can exist between what is observed in staff behavior and their verbal explanations of it [47].

2. MATERIAL AND METHODS

2.1. Aims and Objectives

The aim of the current study is to identify the network of healthcare intervention in dementia wards and to what extend the degree of centrality in the provision of services to PWA can promote their personhood. The objective is to identify who is doing what in terms of promoting PWA personhood. The objective is also to use Social Network Analysis to provide a snapshot representation of health carer-to-task links and practice in dementia wards. Preliminary and unpublished observations from the authors of the current study could identify two major typologies of interventions to promote tasks linked to the advancement of personhood in PWA. In a task-oriented approach to cognitive and social stimulation and rehabilitation, several professionals, working in the same team, individually or in collaboration, address one or more aspects of patients' personhood. In an alternative, in a carer-oriented approach, the same dementia health carer independently addresses several tasks in promoting PWA personhood (Fig. **3**).

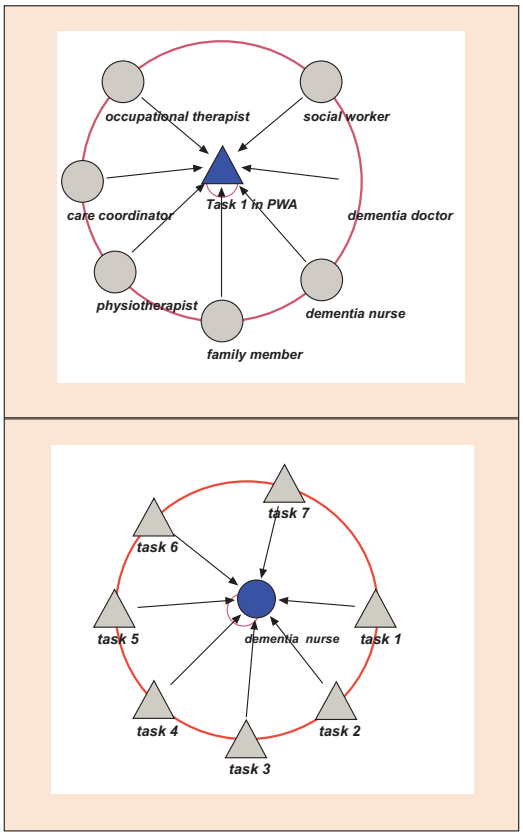

Fig. (3). Task-oriented (above) and carer-oriented (below) approaches in interprofessional practice in Alzheimer's disease. In the task-oriented social network, several professionals attend synchronously (all at the same time) or asynchronously (on an individual basis) to a specific task in patient care. In the carer-oriented approach, the same dementia carer attends to multiple tasks in patient personhood, and other professional figures might or might not participate in the chores.

2.2. Ethnographic Observation

The current study used a mixed-method research approach. The first part of the study involved ethnographical observations. The activities recorded the category of personhood attended, what activity was performed to attend to the targeted personhood, and the professional involved. The principal author's position did not influence the observations as a participant observer, and dementia doctor into the wards examined [48]. The ethnographic observation allowed answering the question, 'Who is doing what in promoting PWA personhood?' If at least one professional was observed as applying the targeted skill in personhood, then this event was captured as occurring and recorded as '1' or 'mostly present.' Instead, if none of the professionals were observed or rarely observed as applying the skill, then this event was recorded as '0' and as 'mostly absent.' The length of observations was daily for a period of 3 to 6 months inside each dementia ward with full participation of the main observer into the ward routines. The Social Network Analysis provided a qualitative and quantitative representation of task-oriented and carer-oriented care into the psychiatric wards treating patients with Alzheimer's dementia as the ethnographic research portrayed it.

2.3. Experimental Design and Data Collection

The convenience sample was represented by dementia healthcare professionals linked to the target locations, all represented by old age and dementia psychiatric wards in private and public hospitals in several health care settings. The days of the observations were standard weekdays, Monday to Friday from 9:00 hours to 17:00 hours. The observing author, who is also the lead author (CL), used a logbook to record activities performed by the dementia teams inclusive of the main variables: personhood attended, sub-type of personhood attended, and professionals involved. During the performed actions, or shortly after, the tasks performed and the professionals involved were recorded on the logbook. As the leading author was also one of the senior doctors, the accuracy of observations was also audited for quality improvement and for implementing the care of PWA. A period of preliminary observations and online perusal of job descriptions for the roles observed helped in refining the behavioral and organizational aspects in care that could be observable and pertinent to the current study.

2.4. The Setting and Population

Target patients in these wards were in intermediate or advanced stages of Alzheimer's disease. One of the wards assessed was in a public psychiatric hospital, and two were in private mental hospitals. The lead author (CL) of the current research worked as a dementia doctor and was the active participant of the ward culture to collect the self-reflective ethnographic observations. Each ward included about 14 beds. Each of the three teams observed for the current research comprised one dementia consultant, one senior doctor, one junior doctor, one ward manager, four dementia nurses, one clinical psychologist, one occupational therapist, one physiotherapist, one hospital manager, one family member, and one healthcare assistant, hence 14 professionals in each team for a total of 42 dementia professionals and 42 patients observed.

2.5. Statistical Methods in SNA

One strategy of qualitative analysis is the description of relationships and configurations within data [52]. The qualitative aim of the study was to capture patterns in the data under investigations [53] through the visual analysis of the social graphs.

SNA is both a quantitative and qualitative method. The quantitative method offers the numerical representation of the degree of centrality (DC) of each professional figure (node/professional) regarding its contribution to each category of patient personhood (node/personhood). Instead, the qualitative analysis aimed to create the figurative representation of partnership in care to promote PWA personhood by capturing the centrality or periphery of each professional role in addressing a specific aspect of personhood.

SNA estimates the degree of centrality (DC) which is represented by the raw number of ties (contribution) of a healthcare professional with the aspect/s of personhood investigated. Degree centrality is also expressed as a percentage (%DC) where 0% corresponds to no centrality while 100% expresses maximum centrality and contribution of a professional role in the provision of service to address the type of personhood under investigation. Hence, dementia health carers who are linked to many tasks in PWA personhood will also have more centrality (%DC) compared to others; they will also have a %DC which will be closer to 100% [37]. The Z score relative to %DC frequency was calculated together with the statistical significance of one proportion with the Software Medcalc [54]. The null hypothesis Ho for the percentages was 50% of the observed frequency. Frequencies that significantly separated from Ho were considered statistically significant either because on the lower or higher level of DC.

The software used for SNA was SocNetv 2.4 [55]. In the quantitative study, the Social Network Analysis computed the DC of each professional figure in implementing the PWA's levels of personhood. The DC score is the sum of weights of outbound edges (performed personhood action) from each node or professional to the sub-category of personhood; in this study, the DC expressed the times a professional was involved in the cited personhood skill, while %DC expressed the rate of involvement out of 100% of the professional in that category of personhood [55].

The visual analysis of the sociogram provided the figurative layout of all actors involved in each category of personhood [56]. The main steps in SNA included all the following [57]:

- Step 1: identification of all the actors and actions involved in the dual-mode network.
- Step 2: identifying the relationship between actors; as the current research is two-mode social network analysis, actors (first node) will be matched with an identified targeted action in personhood (second node) according to the equation Actor×Action.

- Step 3: in a contingency table each node/actor is matched with the corresponding node/action indicating with '1' if the actor is involved and '0' if the actor is not involved in the identified action.
- Step 4: analysis of the network characteristics and 'centrality' of each node/actor in providing the targeted node/action in personhood.

2.6. Focus Groups

The categories generating the aspects of personhood were extracted by the main author's observations in dementia wards and discussed during online peer-discussions and focus-groups at the University of Derby. Focus groups are particularly important to define the insights, approaches, and beliefs of participants about problems, organizations, and prospects [58]. In a focus group, represented by online dementia modules at the University of Derby, learners can debate spontaneously by exchanging their thoughts, ideas, and practices [59].

In the current study, peers were represented by experts in dementia, and post-graduate students coming from healthcare professions. In the year 2018-2019, the leading author was supervised at the University of Derby in research projects, research papers, and peer discussions focusing on dementia care and personhood. The categories of personhood extracted from the ethnographic observations were explored for face and content validity as to what degree they could be representative of PWA personhood. The findings were then confronted in further peer-reviewed papers and conferences and peer-discussions for further validation. Each category was matched with similar findings from the existing literature in search of similarities. Those categories that did not receive enough validation in peer-discussions and from the literature were rejected. The moderators for focus groups were experts in dementia care. Once all peers agreed that a category extracted fully represented a type of personhood in dementia, it was included in the current research. Face validity was also possible as the author's peers involved in the discussion were covering all the professional figures found in dementia wards. Hence, during formal debates, each professional provided confirmation that specific aspects of personhood included in the current study were sufficiently representative of what he or she was doing when caring for PWA. The same process occurred in the dementia wards where the author was an active participant.

The key professional figures working with PWA in the psychiatric dementia wards were:

- [RN] ward nurse
- [WM] ward manager
- [MD] ward doctor
- [HM] hospital manager
- [OT] occupational therapist
- [CLP] clinical psychologist
- [PHT] physiotherapist
- [CCO] care coordinator
- [FAM] family member
- [HCA] healthcare assistant.

The types of personhoods promoted in PWA were:

1) [BP] Biological Personhood where dementia professionals perform the following:

- [BP1] provide regular physical check-ups (blood tests, blood pressure, peripheral glucose, heart rate, peripheral oxygen saturation, temperature) daily or weekly;
- [BP2] professionals apply proper manual handling whenever mobilizing a patient;
- [BP3] complete regular food and fluid intake charts and feed the patient;
- [BP4] monitor constipation, bowel and bladder movements on charts, replace incontinence pads and urinary catheters;
- [BP5] monitor urinary and chest infections once a week or when the patient changes in the clinical presentation;
- [BP6] monitor the risk of falls and act accordingly (*e.g.*, reduce sedative medication) to prevent them;
- [BP7] help the patient reduce the risk of choking and use proper food thickeners when needed;
- [BP8] promote outdoor activities whenever possible;
- [BP9] encourage small exercises to reduce skeletomuscular atrophy and pressure ulcers;
- [BP10] pharmacological treatment of psychological and behavioral symptoms of dementia (PBSD).

2) Individual Personhood [IP] where dementia professionals perform the following:

- [IP1] consider personal or historical values or choices in the communication or actions towards the patient (*e.g.*, past spiritual habits);
- [IP2] create dementia-friendly wards and display the patient's photos and belongings in his or her room;
- [IP3] communicate empathically with patients, even if they can no longer communicate: *e.g.*, use empathic touch and redirect the patient's attention;
- [IP4] ensure that communal areas are spacious and well lit;
- [IP5] ensure that patients have plenty of activities and sensory objects, books with images, music, and leisure.

3) Sociologic Personhood [SP] where dementia professionals perform the following:

- [SP1] authorize and encourage family members to regularly visit the patient; they are helped with transport and directions whenever needed;
- [SP2] organize family and friend reunions in dedicated areas of the hospital;
- [SP3] promote and coordinate patients' leaves to the local area and shopping centers;
- [SP4] promote school meetings to increase local community awareness;

- [SP5] involve local charities to arrange meetings with people of the same age if PWA can attend;
- [SP6] involve the family in the decisions and during revisions of care plans;

The likelihood action of each node/professional will be either not involved in any sub-category of partnership, in some of them or all of them.

3. RESULTS

The professional role more frequently involved (the highest degree of centrality in SNA) in biological personhood was the ward nurse (%DC = 36%, $Z = 2.74$, $p \leq 0.01$), followed by the ward doctor (%DC = 20%) and ward manager (%DC = 20%) (Tables **1**-**3**). In the interprofessional promotion of individual personhood, all the professional figures were involved (DC = 16%), while in the sociologic personhood, the hospital manager had the highest degree of centrality (DC = 33.33%; $Z = 2.45$, $p \leq 0.01$) followed by the ward manager and nurse (DC = 26.66%) (Tables **1**-**3**). The visual analysis of the social networks provided the pictorial representation of the centrality of each professional figure in each personhood. In the case of biological personhood (Fig. **4**), the most central figure was the nurse (RN), followed by the ward manager (WM) and the ward doctor (MD). In the case of individual personhood (Fig. **5**), all professional roles were central and provided support for the advancement of patients' personhood. In the case of sociologic personhood (Fig. **6**), almost all professional figures were involved, although the clinical psychologist (CLP) and healthcare assistant (HCA) were rarely involved in the settings explored.

4. DISCUSSION

The results of the current research captured the network of dementia health carers promoting PWA personhood. As the social analysis found, collaborative care is not distributed among the carers of PWA. In fact, although all aspects of personhood could be attended by all professionals working in dementia wards in public and private psychiatric hospitals, some of these professionals appear to cover more central positions in the provision of services especially when the basic physical needs had to be attended although there was no restriction on who could provide a basic service to PWA. Hence, interprofessional practice is more partial when patient needs are complex and require experienced dedication like attending to physical needs, controlling bowels and bladder function, changing incontinence pads, actively washing patients, and other activities. These actions could be named 'hard practice.' Instead, in 'soft practice,' like communicating with patients, activating ludic activities, promoting outdoor walks, there was more dispersed practice and each member of the team was equally involved. The last activities more closely resembled a cognitive and social stimulation.

Therefore, SNA has offered further insight into the network of the involvement in dementia wards in psychiatric hospitals providing care to PWA. The SNA has also shown the centrality of some professional roles in the promotion of specific types of personhood. The biologic personhood appeared a specific activity, mostly attended by qualified nursing and medical staff. This form of personhood is primarily directed in maintaining the PWA in acceptable physical conditions, in reducing the risk of falls, in avoiding dehydration, in reducing the risk of urinary and respiratory infections, and in lowering the likelihood of choking due to dysphagia. This form of personhood is mostly found in psychiatric wards, public or private, linked to hospitals.

In the individual personhood, all the professional figures were involved. This activity mostly comprises actions performed to consider PWA personal and historical values, the effort to make dementia-friendly wards and to communicate empathically with patients. Also, in the sociologic personhood, all the professionals were involved in encouraging family visits into the ward or family reunion during patient's leave, in promoting extended leaves from hospital when the presentation allowed it, in raising community awareness about Alzheimer's disease, and in having the family as an active participant in the care plans involving a family member with Alzheimer's dementia. The unobtrusive ethnographic study has advanced extended observations without interrupting clinical routines in the wards, and by gently capturing routine behaviors as one of the researchers was a participant observer. Furthermore, SNA has improved the analysis of how the actions of interprofessional teams coordinate inside Alzheimer's wards by capturing the centrality or periphery of specific professional roles in the advancement of PWA personhood.

The authors of the current research observed that when team collaboration, support, and enough human resources were present in the wards, and when all jobs descriptions were filled, then all aspects of personhood could be attended. SNA has also offered the opportunity to capture team density in providing each different section of service to PWA. However, as emerging in the current research, the centrality of some professionals and the peripheral intervention of others could be used to address the policies of changes. Nonetheless, increased centralization of one task in the same professionals could make them as less prone to access subsidiary and vital information and influences that can derive by those who are more isolated and at the periphery of the social network, these last roles made redundant in providing a targeted service [60]. Nonetheless, the centrality of an actor in the social network entails a more favorable position in the provision of a service or action [60] in the current research indicated by outbound ties connecting the actors to the targeted actions of personhood.

As in the current study, different aspects of personhood require skills that place several professionals at the core of the network for providing specific care. The visual analysis of the social network can thus be an instrument to indicate areas of reinforcement (*e.g.*, with particular training) of those professionals that have fewer skills or clearance to address a specific area of PWA personhood. Hence, SNA has provided an insight of who are the gatekeepers [57] in delivering a service also because networks with a high number of professionals occupying a central position have a lower frequency for external referrals [43]. Our research has also shown that apart from biological personhood which requires specific skills to address patient's needs, almost all professionals were occupying a central position in the network for other

Table 1. Outcomes in partnership in Alzheimer's care according to the professional role as from the ethnographic observation.

Personhood	Activity of the Health Carer	Professional Role Involved
[BP] Biological personhood:	[BP1] provides regular physical check-up	[RN]nurse; [MD]doctor; [HCA]healthcare assistant
	[BP2] applies proper manual handling	[RN]nurse; [PHT] physiotherapist; [HCA]healthcare assistant
	[BP3] uses fluid intake charts	[RN]nurse; [HCA]healthcare assistant
	[BP4] monitors bodily functions	[RN]nurse; [HCA]healthcare assistant
	[BP5] monitors urinary and chest infections	[RN]nurse; [WM]ward manager; [MD]doctor
	[BP6] monitors and reduce risk of falls	[RN]nurse; [WM]ward manager [MD]doctor
	[BP7] reduces the risk of chocking	[RN]nurse; [WM]ward manager; [MD]doctor; [PHT]physiotherapist
	[BP8] uses pharmacological treatment of BPSD	[RN]nurse; [WM]ward manager [MD]doctor;
	[BP9] controls side effects of medications	[RN]nurse; [WM]ward manager; [MD]doctor
[IP] Individual personhood:	[IP1] considers personal and historical values	[RN]nurse; [WM]ward manager; [MD] doctor; [CLP] clinical psychologist; [CCO] care coordinator; [FAM] family member; [HCA] healthcare assistant
	[IP2] creates dementia friendly wards	[HM]hospital manager; [OT]occupational therapist
	[IP3] communicates empathically with patient	[RN]nurse; [WM]ward manager; [MD]doctor; [HM]hospital manager; [OT]occupational therapist; [CLP]clinical psychologist; [PHT]physiotherapist; [CCO]care coordinator; [FAM]family member; [HCA]healthcare assistant
[SP] Sociologic personhood:	[SP1] encourages visits of family members	[RN]nurse; [WM]ward manager; [MD]doctor; [HM]hospital manager; [CCO]care coordinator
	[SP2] organises family reunions	[RN]nurse; [WM]ward manager;[HM]hospital manager; [OT]occupational therapist; [CCO]care coordinator
	[SP3] promotes and coordinates patient's leaves	[RN]nurse; [WM]ward manager; [MD]doctor; [OT]occupational therapist; [CCO]care coordinator
	[SP4] promotes community awareness	[HM]hospital manager; [OT]occupational therapist
	[SP5] involves local charities for PWA meetings	[HM]hospital manager; [OT]occupational therapist; [FAM]family member
	[SP6] involves family members in care plans	[RN]nurse; [WM]ward manager; [MD]doctor; [HM]hospital manager; [FAM]family member

Table 2. Incidence Matrix extracted from Table 3.1 for biological personhood (BP), individual personhood (IP) and sociological personhood (SP) indicating with '1' a professional involved most of the time, and with '0' a professional rarely or not involved.

	RN	WM	MD	HM	OT	CLP	PHT	CCO	FAM	HCA
BP1	1	0	1	0	0	0	0	0	0	1
BP2	1	0	0	0	0	0	1	0	0	1
BP3	1	0	0	0	0	0	0	0	0	1
BP4	1	0	0	0	0	0	0	0	0	1
BP5	1	1	1	0	0	0	0	0	0	0
BP6	1	1	1	0	0	0	0	0	0	0
BP7	1	1	1	0	0	0	1	0	0	0
BP8	1	1	1	0	0	0	0	0	0	0
BP9	1	1	1	0	0	0	0	0	0	0

(Table 2) contd….

	RN	WM	MD	HM	OT	CLP	PHT	CCO	FAM	HCA
IP1	1	1	1	0	0	1	0	1	1	1
IP2	0	0	0	1	1	0	0	0	0	0
IP3	1	1	1	1	1	1	1	1	1	1
SP1	1	1	1	1	0	0	0	1	0	0
SP2	1	1	0	1	1	0	1	1	0	0
SP3	1	1	1	0	1	0	0	1	0	0
SP4	0	0	0	1	1	0	0	0	1	0
SP5	0	0	0	1	1	0	0	0	1	0
SP6	1	1	1	1	0	0	0	0	1	0

Table 3. SNA for the degree of centrality for professionals involved in promoting personhood in PWA.

Personhood	Profession	DC[1]	%DC[2]	*Z* score
Biological personhood:	RN	9.000	36.000	2.74[3]
	MD	5.000	20.000	1.05
	WM	5.000	20.000	1.05
	HM	0.000	0.000	1.05
	OT	0.000	0.000	1.05
	CLP	0.000	0.000	1.05
	PHT	2.000	8.000	0.21
	CCO	0.000	0.000	1.05
	FAM	0.000	0.000	1.05
	HCA	4.000	16.000	0.63
Individual personhood:	RN	2.000	16.667	0.70
	MD	2.000	16.667	0.70
	WM	2.000	16.667	0.70
	HM	2.000	16.667	0.70
	OT	2.000	16.667	0.70
	CLP	2.000	16.667	0.70
	PHT	1.000	8.333	0.17
	CCO	2.000	16.667	0.70
	FAM	2.000	16.667	0.70
	HCA	2.000	16.667	0.70
Sociologic personhood:	RN	4.000	26.667	1.75
	MD	3.000	20.000	1.05
	WM	4.000	26.667	1.75
	HM	5.000	33.333	2.45[3]
	OT	4.000	26.667	1.75
	CLP	0.000	0.000	1.05
	PHT	1.000	6.667	0.35
	CCO	3.000	20.000	1.05
	FAM	3.000	20.000	1.05
	HCA	0.000	0.000	1.05

[1]DC=Degree of Centrality of each professional;
[2]%DC=percentage of DC of each professional;
[3]$p<=0.01$

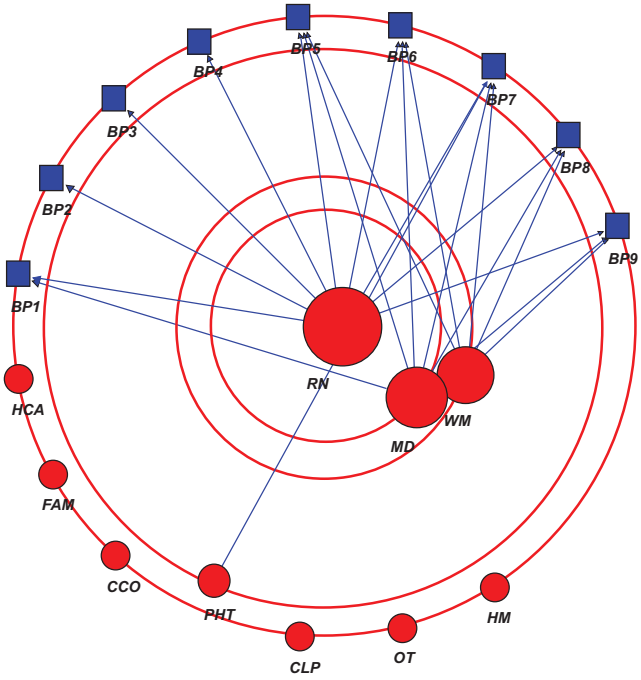

Fig. (4). Social network of the professionals involved in biological personhood. The nurses, doctors and ward managers appear at the center of the network. Although attending to biological personhood requires desirable but not essential skills, not all the dementia carers were involved in this aspect hence placing them more at the periphery of the network.

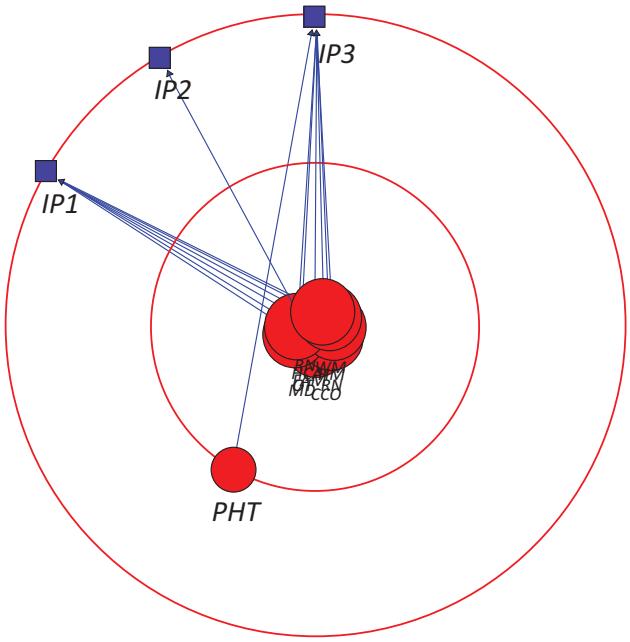

Fig. (5). Social network of the professionals involved in individual personhood. All the professionals were involved in this aspect of personhood with the physiotherapist observed slightly more at the periphery of the network. The concentration at the center indicates that teamwork is aware of how to implement this aspect of personhood.

types of personhood, hence ensuring that each member of the team was involved in patient-centered care.

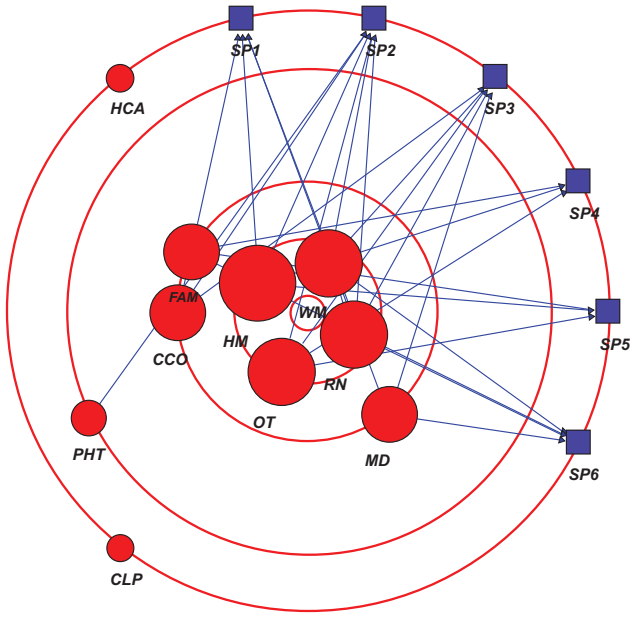

Fig. (6). Social network of the professionals involved in the sociologic personhood. Social and cognitive activation of patient's skills are attended by all professionals in the dementia ward. There is even distribution of tasks although few professionals were not observed as attending to these skills probably due to the requirements of their own role.

Therefore, one global conclusion is that in the contexts examined, there was shared participation of all professionals in maintaining the personhood of PWA. It was assumed that the psychiatric dementia wards observed adopted Kitwhood's type B organizational model with personnel sharing of values and skills within the team; here, joint participation in patient care is assumed to be also promoted when there is a mutual trust and when team members become used to the procedures, patients, staff, and policies [6]. High core density in the social network indicated that each member of the multidisciplinary team knew the procedures, other team members, patients, families, environment, and facilities. Hence, in the observed hospital wards, staff could attend to the three forms of personhood simultaneously hence occupying central positions in the social network unless their job specifications did not require them to attend to a specific type of personhood.

Consequently, having different dementia healthcare professionals working in synergy in patient's personhood can facilitate the activation of different cognitive and social skills in PWA while stimulating increased connectivity in the DMN network. More likely to trigger DMN would be a collaborative approach with an extended network of professionals working on different cognitive, social, and physical demands of patients, avoiding network gaps while promoting holistic care to PWA. As reported in the introduction, activating the cognitive skills that are still intact will have an indirect effect also on other cognitive abilities that are more vulnerable to Alzheimer's Dementia, this process of activation being called 'connectivity' [11]. An advantage of cognitive stimulation is that it bears no adverse reactions making it suitable for PWA who already present with multiple illnesses and medications [65].

4.1. The Methodological Approach

Beyond the subset examined and within the extent of the aims of the current study, SNA provided a pictorial and sociometric interpretation on how healthcare professionals in multidisciplinary teams provide care to shared patients; similarly, SNA has opened new insights into ways in which care can be improved and offered openings for social changes [61]. The findings of the current study can advocate SNA in other settings of healthcare as a valid instrument for representing joint synchronous and asynchronous care of patients when professional health carers are pursuing a shared care plan. This last venue is encouraging for novel studies as SNA in not frequently used for the scoping of representing interprofessional practice [62]. As also emerging from the findings of the current research, SNA can help researchers study the causes of social selection and influence [63]. Practical applications of SNA can help health organizations to reach their missions in patient quality of care while endorsing the reasons for allocating more resources to improve care [64].

4.2. Limitations of the Current Study

The limitation of the current research is linked to the fact that the results are only applicable to the wards explored and cannot be generalized to other settings as policies might change regarding professional duties in different wards and regions. Furthermore, there might be differences when the findings are applied to residential homes with less personnel on the ground. Besides, the hypothesis of the different participation of several professionals in promoting patient personhood and centrality in the network can be also attributed to the experience in the task and not linked exclusively to a specific professional role. Lastly, although not all healthcare professionals were involved in some forms of personhood, they could be indirectly promoting each of its forms by supporting colleagues who occupied more central positions in the social group, but this was not captured by SNA analysis. These unmeasured/uncontrolled variables should be considered when i) interpreting the findings of the current study, and ii) planning further studies.

CONCLUSION

The promotion of the personhood in PWA requires coordinated actions of all the healthcare professionals working in dementia wards. In the settings examined, all professionals were aware of the multifaceted aspects of personhood in PWA although not all the professionals addressed them while they had the skills to do so. Therefore, the current study proposes to extend the analysis of health carers' implementations of PWA personhood and to use SNA as an instrument to capture the nature and degree of their interventions, and to identify areas of reinforcement for improving quality of care and safety for PWA. The findings of the current research can be extended to other settings working with PWA, and can contribute to the organizational allocation of human resources to promote personhood in PWA. Likewise, the findings can help to empower PWA professionals and augment PWA safety and quality of care.

LIST OF ABBREVIATIONS

SNA = Social Network Analysis

PWA = Persons with Alzheimer's Disease

DMN = Default Mode Network

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

According to the requirements of the Medical Research Council and the NHS Health Research Authority, the current research did not need national clearance in the UK.

HUMAN AND ANIMAL RIGHTS

No Animals/Humans were used for studies that are base of this research.

CONSENT FOR PUBLICATION

Local managers and participants observed in the hospitals where the research took place gave their verbal consensus to publication at the condition that no identifiable data was disclosed.

AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the article is available in the current study only. Therefore, researchers, hospitals and users interested in the data will be provided with the link to access the present article or will access it via search engines.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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