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## Considering the team in team formulation: a systematic review

### Abstract

**Purpose:** Team formulation, used to understand patient problems and plan care is a growing practice in adult mental health and learning disability services. This paper explores definitions applied to team formulation (as distinct to therapy formulation), its underpinning theories, and the inter relationship between the team and the process of formulation.

**Design/Methodology/approach:** A database search (main search term of team formulation) of peer-reviewed studies was conducted using PRISMA guidelines. A main and second reviewer conducted quality appraisals and thematic analysis. Data were analysed by convergent qualitative synthesis design using thematic analysis to transform evidence from quantitative and qualitative studies into qualitative findings.

**Findings:** Initial searching produced 4532 papers, 10 of which were eligible for inclusion. Team formulation has no distinct definition. Theories underpinning the practice of therapy formulation emanating from general psychological theory underpin team formulation. Seven studies applied psychological theories to the examination of team formulation. No studies examined the impact of the team on the formulation. Six themes were generated regarding the impact of team formulation on the team; ‘increased knowledge and understanding’, ‘altered perceptions, leading to altered relationships, feelings and behaviours’, ‘space to reflect’, ‘useful when stuck or challenged’, ‘perceived increase in effectiveness’, and ‘improved team working’.

**Research limitations/implications:** Limited evidence and variable quality compromised availability of review evidence.

**Originality/value:** This is the first review to examine team formulation through the context of the team. The authors argue that a conceptual framework to encompass team inputs, processes and outputs in team formulation practice should guide future research.

**Keywords:** Team formulation. Evidence based team formulation. Team formulation definition. Team formulation theory. Team context and team formulation. Team formulation impact.

**Paper type:** Literature review

Declaration of Interest: None

## **Introduction**

Multi-disciplinary mental health and learning disability clinical teams, working together to develop individual patient case formulations is an increasing practice within the United Kingdom (Johnstone., 2011). Known as ‘team formulation’, the purpose is to develop a shared understanding of the patient to determine the interventions (Johnstone, 2014). Research underpinning team formulation is of relevance to clinical practice globally. National guidelines indicate that care that should be provided based on diagnosis (for example see NICE, 2014a, 2014b; NIMH, 2016), however individualised care is also required (HMG/DH, 2011; World Health Organization, 2015). Team formulation guides the design of individual care for patients experiencing a range of mental health problems, some of which are considered complex (for example see Berry, Barrowclough, & Wearden, 2009). Therefore, determining a patient’s unique needs through the lens of team formulation may afford this individualised focus. Understanding the evidence base for this practice is of critical importance in supporting teams to use evidence based practice.

Individual psychological case formulation (therapy formulation) emanated from behaviour therapy in the 1950’s when it was developed as a central component for understanding the problematic behaviours of individual patients (Bruch, 2015). Now it is recognised as a central tenet of most one-to-one psychological therapies where a single therapist works with a single patient to develop a collaborative formulation (Sturmey, 2009). Studies examining therapy formulation report a weak evidence base. For example, a recent systematic review examining the inter-rater and test–retest reliability of therapy formulations across various therapeutic modalities reported considerable differences in reliability. This ranged from slight to substantial, depending on practitioner experience and therapy modality (Flinn, Braham, & das Nair, 2015). Furthermore, there is limited evidence for impact on patient outcomes (Bieling & Kuyken, 2003; Kuyken, 2006). Researchers examining formulation within the Cognitive

Behavioural Therapy (CBT) model challenge whether the scientific constructs underpinning formulation are evidence based and able to demonstrate a valid framework for understanding patient problems. Research has not yet comprehensively examined the descriptive and explanatory elements of therapy formulation, particularly in relation to outcome prediction (Bieling & Kuyken, 2003).

Despite these uncertain foundations, formulation has continued to evolve, from one-to-one application in individual psychological therapy, to its most recent application by teams. The earliest published report of formulation being used by teams was in 1997, when a practice account of the use of Cognitive Analytic Therapy (CAT) formulation was described as a team endeavour, used to understand patients diagnosed with personality disorder. This descriptive account, published in a non-peer reviewed professional forum magazine (Dunn, 1997) has preceded further descriptive accounts (for example see Davenport, 2002; Robson & Quayle, 2009; Shirley, 2010; Whomsley, 2010), and the suggested evidence for the benefits of team fomulation continues to expand. However, evidence is originating from a small research base accompanied by a greater number of practice accounts and opinion pieces, published in non-peer reviewed publications, which attest to the benefits of team formualtion. This is evident from a succinct summary of team formulation offered by Johnstone, which highlights the benefits of team formualtion as supporting increased team functioning and well-being (for example using the expertise of all team memebhrs, increasing team ability to reflect), and bringing a more balanced and effective approach to interventions (Johnstone, 2014). This evidence base poses several problems. Rather than evidence-based practice, team formulation is developing from a basis of untested and poorly collated, practice-based experience. As the practice spreads, the degree to which team formulation can be considered a separate phenomenon to therapy formulation, with its own unique definition and underpinning theory, is not clear. Furthermore, researchers have examined the impact of the clinician on the

therapy formulation, scrutinising the level of practitioner skill and experience on the formulation produced (Dudley, Park, James, & Dodgson, 2010; Eells, Lombart, Kendjelic, Turner, & Lucas, 2005), however, it is unclear whether studies on team formulation are similarly accounting for the team context.

The impact of team processes on the execution of specific team tasks is well documented. A large study of over 400 United Kingdom National Health Service health care teams, including teams from physical and mental health care, concluded that team processes such as participation, reflexivity, decision making, leadership and communication impacted on team levels of effectiveness and innovative practice (Borrill et al., 2013). Teamwork is also essential for team reliability and patient safety (Baker, Day, & Salas, 2006) and professional differences in teams impact on joint working and knowledge sharing (Baxter & Brumfitt, 2008). Nonetheless, the impact of the team processes involved in team formulating remain undefined and untested. Considerations such as these may be crucial in developing an evidence base that embeds team formulation within the team context.

The aim of this paper is to report the results of a systematic mixed study review of team formulation research. The specific objectives are to provide a systematic map of research on team formulation in adult mental health and learning disability services (including forensic and older people's services), and to examine and synthesise the findings in relation to:

- a. how team formulation is being defined as a phenomenon in its own right and as distinct to psychological therapy formulation
- b. the theoretical underpinnings of team formulation
- c. the impact on the formulation through team involvement
- d. the impact on the team due to formulating as a team

The present review takes a deductive, theory driven approach to examine if current research on team formulation addresses these aspects and highlights the direction for future research.

## **Method**

### ***Literature searching***

A search strategy was created with an initial search in the Web of Science database, using the term 'team formulation'. This enabled development of a wider range of terms (Table one). Boolean operators were used and searches restricted to peer reviewed, human studies and disciplines related to mental health services. The electronic databases were searched during October 2016 and included Cinahl, Medline, Psycarticles, Psycinfo, SCIE, Social Sciences Citation Index and Embase. Date boundaries were not specified in order to maximise output from search results that ran from inception date of each database.

Insert Table one here. Search Terms

### ***Inclusion screening***

Based on the inclusion criteria in Table two, all identified records were screened by title and then abstract before final full text reading of identified records.

Insert Table two here. Inclusion Criteria

Exclusion criteria included records focused on psychological therapy formulation that did not involve a team, opinion pieces, and descriptive records.

### ***General approach***

A convergent qualitative synthesis design using thematic analysis (Figure one) was employed to transform evidence from both quantitative and qualitative studies into qualitative findings (Pluye & Hong, 2014). A theory-driven strategy focusing on specific research objectives as pre-defined themes, and an amalgamation of evidence from both intervention and non-intervention research were used to understand the phenomena of ‘team’ within team formulation (Fetters, Curry, & Creswell, 2013; Hong, Pluye, Bujold, & Wassef, 2017).

Insert Figure 1 here. Synthesis design

### ***Data extraction and quality assessment***

A standardised data extraction form (EPPI-Centre, 2003) was adapted to fit with specific review aims. The type of quality assessment used was matched to study type. Quality assessment tools included Quality Assessment Tool for Before-After (Pre-Post) Studies With No Control Group (NIH, 2014), Critical Appraisal Skills Programme (CASP) Qualitative Studies Checklist (CASP, 2017a) and CASP Randomised Control Trial Checklist (CASP, 2017b). Quantitative studies with a qualitative element were assessed for both where possible. If the qualitative part of the study was not reported as such, then the main study design was assessed. Three studies were quality appraised by a second reviewer to ensure consistency in quality appraisal.

### ***Data synthesis***

Examination began with introductory and background sections to studies in order to identify definitions of team formulation (review aim one). Thematic analysis was used (Braun & Clarke, 2006) in which line-by-line coding was applied for both quantitative and qualitative



studies to create descriptive themes for all other review aims. Theoretical underpinnings (review aim two) were identified and logged semantically, as they were cited in the studies. Thematic analysis was employed to establish the purpose of citing theories within studies.

Coding was employed to locate instances where the impact of the team on the formulation, and the formulation impact on the team (review aims three and four), was reported in study findings. Located instances were subjected to selective and semantic coding, in which the reviewers used the explicit descriptions given in research findings (Braun & Clarke, 2013). Visual mapping was applied for instances located for review aim four in order to develop themes derived from coding (Braun & Clarke, 2013). NVivo qualitative data software was used to support the coding process (QSR International Pty Ltd, 2015). Final themes were reached through consensus agreement with an independent second reviewer (NH-G). This type of data transformation analysis is suitable to precede the development of a conceptual framework where none currently exists (Hong et al., 2017) as is the case for team formulation.

## **Results**

Figure two illustrates the search process. The search resulted in 10 research studies that matched the inclusion criteria and all were UK based studies. Of these, five were uncontrolled pre-post studies (Berry et al., 2009; Ingham, 2011; Ingham, Clarke, & James, 2008; Maguire, 2006; Revolta, Orrell, & Spector, 2016), three of which had a descriptive feedback element (Ingham, 2011; Ingham et al., 2008; Revolta et al., 2016). There were three qualitative studies (Christofides, Johnstone, & Musa, 2012; Mohtashemi, Stevens, Jackson, & Weatherhead, 2016; Summers, 2006), and two randomised controlled trials (RCT) (Berry et al., 2016; Kellett, Wilbram, Davis, & Hardy, 2014). One of the RCTs was a mixed method

study employing non-blinded randomisation and content analysis of semi-structured interview material (Kellett et al., 2014).

Insert figure two here. PRISMA diagram

Study details and key findings including reported effect sizes are presented in table three. The team formulation in the studies was conducted either as team formulation meetings involving the whole or part of the team where the meeting was facilitated by a psychologist or psychological therapist; or team formulation training centred on real clinical case material, including team discussion. Team supervision was also provided in some instances.

Insert table three here. Included Studies Details

### *Quality appraisal results*

Three of the pre-post uncontrolled intervention studies were deemed to be of poor quality (Ingham, 2011; Ingham et al., 2008; Maguire, 2006) due to high levels of bias. Two further studies of this kind were judged as poor to fair quality (Berry et al., 2009; Revolta et al., 2016) because although still vulnerable to high levels of bias due to design, clearer detail was reported about loss-to-follow-up of participants and p-values for pre to post intervention.

Three of the pre-post studies also contained a qualitative element in the form of descriptive feedback gathered from the sample post intervention (Ingham, 2011; Ingham et al., 2008; Revolta et al., 2016). In all three studies, this qualitative data focussed on acceptability of formulation training given. CASP qualitative study analysis (CASP, 2017a) suggests that the style of reporting in all three studies is not in keeping with high quality qualitative research reporting.

Use of the CASP qualitative study tool indicated that the methodological quality of the three qualitative studies was variable, but generally of fair quality. However the qualitative part of the mixed method study (Kellett et al., 2014) was poor. The RCT feasibility study (Berry et al., 2016) was also assessed using the CASP for RCT tool and was rated as fair.

### ***Definitions of team formulation***

None of the studies offered a definition of formulation explicit to team formulation, and where a definition was given this was distinct to the therapy type. There was no examination of whether this definition of formulation was applicable to a formulation conducted by a team.

Five studies employing therapy formulation definitions, researched team formulation against these definitions (Christofides et al., 2012; Ingham, 2011; Kellett et al., 2014; Mohtashemi et al., 2016; Summers, 2006). These studies identified formulation as a hypothesis, drawing on psychological theory, regarding the origins, development and maintenance of mental health problems. Four studies provided the function of a formulation, but not the definition (Berry et al., 2009; Berry et al., 2016; Ingham et al., 2008; Revolta et al., 2016). Formulation function was described as providing a framework to understand the origin, development and maintenance of mental health problems. One study did not provide a definition or describe the function of a formulation (Maguire, 2006).

### ***Theoretical underpinnings***

Thirteen theories emerged across 10 studies in relation to team formulation research.

Theories were used to support both study rationale and question, or as underpinning the team formulation process. Explicit explanation in describing the link between theory and its application in the study varied. For example Berry and colleagues (Berry et al., 2009; Berry

et al., 2016) offered a clear link between attribution theory and study rationale. However, other researchers referred to psychological theory as underpinning formulation, without defining the theory (Ingham, 2011; Mohtashemi et al., 2016; Summers, 2006). With the exception of one study (Kellett et al., 2014), theory was applied to individual staff working in teams and not applied to group level data. The relationship to theory, its part in the studies and related findings is outlined in table four.

Insert table four here. Underpinning theories.

### ***Team impact on the formulation***

None of the studies purposely examined the impact of the involvement of the team on the quality, content or outcomes of the produced formulation. It was not possible to apply convergent qualitative synthesis as only one study reported results indicating two impacts that the team had on the formulation. Firstly, the amount of perceived creativity brought to the formulation by use of team input:

“Participants believed that formulations benefited care planning, staff-patient relationships, staff satisfaction and team working, through increasing understanding of patients, bringing together staff with different views and encouraging more creative thinking” (Summers, 2006, p.341).

Secondly, the view that the team formulation was an enduring concept rather than a hypothesis subject to change over time:

“At least three participants seemed to consider formulations as statements of fact” (Summers, 2006, p.342).

### ***Formulation impact on the team***

Eight studies reported team outcomes occurring as a result of team formulation and coding resulted in 66 codes from which six themes were conceptualised. These themes were:

‘increased knowledge and understanding’, ‘altered perceptions, leading to altered relationships, feelings and behaviours’, ‘space to reflect’, ‘useful when stuck or challenged’, ‘perceived increase in effectiveness’, and ‘improved team working’.

*Increased knowledge and understanding.* Team formulation increased understanding and knowledge of the patient, the origin and nature of their problems, and increased knowledge of the way the team and patient interacted. Although not the most frequently coded, this theme was the mechanism through which all other themes were described as operating, and as such could be seen as a key outcome of team formulation.

*Altered perceptions, leading to altered relationships, feelings and behaviours.* Closely linked to this was the most frequently coded theme that described the impact of team formulation on staff perceptions and the resulting change in staff/patient relationships, staff feelings about the patient and staff behaviours towards the patient. Perceptions were altered in relation to the patient’s problems, their efforts at recovery, how long recovery might take and how much control the patient and staff member had in this. Changed perceptions about staff/patient relationships were positive, however one study did report that staff perceived a worse relationship with patients after formulating. The impact of altered perceptions was described as resulting in altered staff feelings and behaviours, in particular less blaming behaviours towards patients, increased empathy and a more positive approach to care. Patients also reported feeling less criticised by staff. Furthermore, there was an impact on the staff perceptions of their own emotions in terms of feeling more satisfied, but with the recognition that formulating can be personally emotionally challenging.

*Space to reflect.* The third theme captured the opportunities for clinical reflection afforded by team formulation. Reflection was possible as meeting to formulate gave the team increased

time to think about the patient. This supported creation of new ideas about the patient and the care, and was viewed as a major benefit of team formulation. There was one concern that such reflection could result in a high degree of speculative suggestion based only on partial information.

*Useful when stuck or challenged.* The fourth theme identified team formulation as a useful process when patients presented with behaviours that challenged the team. Team formulating was also reported as useful when teams felt ‘stuck’ in thinking about how to progress a patient’s care.

*Perceived increase in effectiveness.* The impact of having time to think and increasing understanding about the patient lead to the fifth theme in which team formulating was perceived as helping to increase the effectiveness of the team. This was described as bringing consistency to team practice, improving problem solving ability, supporting the team to change clinical direction and changing unhelpful patterns of relating with the patient. An increase in clinical confidence was perceived, leading to care which was more helpful for being based on a formulation (rather than diagnosis alone).

*Improved team working.* The sixth theme, also linked to team effectiveness, described the impact of team formulation on the team as a unit, relative to strengthening how team members work together. Within this theme, team formulation was reported as improving the team climate and working capability. In addition, trust and sharing within the team were reported as improved directly due to team formulating. Team practices were improved through team formulation that brought unity to understanding, different perspectives, ideas and disciplines. Sharing information in this way was viewed as a practice of effective teams and communication via team formulation credited for turning individuals in teams into team members.

## **Discussion**

This is the first review that focuses on the ‘team’ aspect of team formulation, providing a comprehensive systematic mixed studies review of the peer reviewed research evidence for this team practice. The key objectives were to identify the definitions and theories applied to team formulation research, and to qualitatively synthesise findings on the bidirectional influences of team formulation and team.

### ***Methodological Rigour***

The methodological rigour of the 10 studies included suggests an emerging field of research with study quality being highly variable and mostly low. Using team formulation as the intervention in pre-post uncontrolled small-scale studies formed half of all methodological approaches. This represents a problem for the evidence base for team formulation as it is difficult to determine causation and there is a risk of high levels of bias (Goodacre, 2015).

The Cochrane Collaboration recommends that such studies constitute insufficient evidence to inform theory (Cochrane, 2017).

Rigour of analysis was difficult to determine for all three studies examining the impact of team formulation on team members. The small number of studies further reduces the available research evidence that the impact of formulating has on team members.

While RCTs are considered capable of providing reliable evidence of effectiveness (Cochrane, 2017), the two RCTs within the review were compromised by methodological limitations. For example, Kellett and colleagues recognised that the sample size was small and there was a risk of contamination between the intervention and ‘treatment as usual’ arms (Kellett et al., 2014). Berry and colleagues acknowledged that the reported modified staff

perceptions could be attributed to staff feeling that their own needs for support were better met rather than the impact of formulating (Berry et al., 2016).

### ***Definitions of Team Formulation***

Defining a phenomena in research is critical for the measurement of variables and comparison of findings across studies (Coolican, 2009). One included study provided no definition of formulation (Maguire, 2006) and the remaining nine applied the definition of therapy formulation to team formulation. This assumption that team formulation *is* the same as therapy formulation has not yet been examined and is further challenged by therapy formulation having more than one definition (Johnstone & Dallos, 2014). The Division of Clinical Psychology in the United Kingdom offers an overarching definition that describes psychological therapy formulation as the amalgamation of all knowledge gained by an assessment process that may involve psychological, systemic and biological aspects. The definition posits therapy formulation as drawing on psychological research and theory, to provide a framework for describing problems, needs and their development and maintenance (DCP, 2010). Other key authors of formulation literature emphasise the hypothetical nature of therapy formulations (Butler, 1998; Eells, 2006). Applying the therapy formulation definition to team formulation fails to account for the influences and context of the team itself. Any working definition should account for the focus on a shared understanding as proposed by Johnstone (Johnstone., 2011), but in addition acknowledge that this is underpinned by team involvement:

‘Team formulation is a shared team activity drawing on psychological theories (individual and group), where two or more team members meet to discuss an evolving integrated formulation. Team formulation is a shared understanding which includes a service user’s personal meaning of their experiences and which leads to a hypothesis about the causes



and maintenance of their mental health problems, strengths and coping, in turn leading to an agreed individualised plan of care to support personal recovery. The service user is involved in the formulation discussion wherever possible’.

### ***Theory and Team Formulation***

There is an assertion that team formulation is underpinned by psychological theories used in therapy formulation. Some studies specify which psychological theory, whilst others do not (see table four). This represents an assumption that therapy formulation and team formulation can be underpinned by the same theories; however, this has not been empirically examined. In addition there is an emergence of studies drawing on theory (such as attachment or attribution) which drive study hypotheses proposing a relationship between team formulation, staff perceptions, attitudes and behaviours towards service users, resulting in a changed relationship. Four of the included studies have tested these hypotheses (see Berry et al., 2009; Berry et al., 2016; Ingham, 2011; Kellett et al., 2014). However, due to the number of studies and quality, there is no level of generalisation in these theories yet (Ravatch & Riggan, 2012), and not all study hypotheses were supported in relation to this changed staff-patient relationship (see Berry et al., 2016). In keeping with the properties of a theory, none offered have explanatory qualities in relation to the processes of team formulation (Ravatch & Riggan, 2012). In other studies, claims that such theories are important within team formulation remain an untested assertion (for example see Christofides et al., 2012; Ingham & Clarke, 2009). None-the-less, together these studies represent an early attempt to examine an evolved form of formulation (from therapy to team), and give partial support to the impact of team formulation on team members.

The application of theory in the studies is mainly about individuals in teams, rather than teams per se. Only one study aggregated the analysis of individuals in the teams studied to a group level (see Kellett et al., 2014). This suggests that researchers are examining individual team members rather than the team as a unit. This narrow focus ignores the range of well-tested theories relating to teams generally, that may also be relevant to team formulation. For example, theories of shared mental models in teams describe a cognitive representation of shared team knowledge in relation to a task or team values (Mathieu, Maynard, Rapp, & Gilson, 2008). Team formulation may lead to developing such a shared mental model, in relation to either a particular patient, the general task of formulating or the values that formulating can bring to a team when ideas are shared. In addition, theories of team identity and cohesion may underpin team formulation research by explaining the collective sense-making that team formulation may bring, and which is understood to help team identity develop (Huettermann, Doering, & Boerner, 2017). Regular team formulating may help in developing team cohesion as team members share this common task around a set of common goals and team values (Mathieu et al., 2008).

### ***Team Impact on Formulation***

The impact of the team on the formulation was not examined in any of the included studies. Therapist factors have been found to impact on therapy formulation quality (Dudley et al., 2010; Eells et al., 2005), yet this review did not find any studies examining the quality of the formulation produced by a team. Training the team in the mechanics of formulating was examined (see (Ingham, 2011), however this was by brief training without accompanying long-term supervision or on-going learning; aspects both recognised as important in one-to-one therapy competency and skill development (BABCP, 2010). Status of team members has been reported as influencing the ability of other team members to have a voice within group

meetings and discussions (Mannix & Sauer, 2006; Silver, Troyer, & Cohen, 2000). In team formulation, the dominance of one profession may serve to reduce the input of other team members and influence the formulation if key information is withheld.

Although the clinical focus of the teams was reported, there was no examination of the type of team and how this influenced the team formulations. Team type is of key interest in team research where there is recognition of the interplay between team type, task and outcomes. For example, established researchers of teams suggest that composition, technology and distance and the degree of empowerment and delayering present in different types of teams impacts on task performance (Tannenbaum, Mathieu, Salas, & Cohen, 2012). Other researchers suggest that not all teams function as ‘real’ teams, which can also influence task performance. For example ‘pseudo’ teams, who possess lower degrees of interdependence, shared objectives, reflexivity and boundedness may also have lower task performance ability (West & Lyubovnikova, 2012).

### ***Formulating and its Impact on the Team***

To date, team formulation studies offer only partial insights into the impact of the team formulation on the team. The review identified themes suggesting that team formulation leads to increased understanding, team reflection time and problem solving ability. This part of the review yielded the most results, perhaps reflecting the interest of researchers to identify influences on the team. However, only four included studies used validated self-report and observational measures (Berry et al., 2009; Berry et al., 2016; Kellett et al., 2014; Revolta et al., 2016), while the remaining six studies used un-validated self-report measures and descriptions of staff observations and experiences (see table three). Overall, the small number and variable quality of included studies limits the evidence for the impact of team formulation on the team.

Three studies (Berry et al., 2009; Berry et al., 2016; Revolta et al., 2016) examined the impact of team formulation on the attitudes of team members but did not account for possible confounds researched in other fields. For example, self-categorisation theory demonstrates the influence of group membership on attitudinal changes of individuals. The theory posits that individuals compare self to others, and are motivated to adopt the values and attitudes of other group members due to the desire to belong to the 'in-group' (Haslam, Powell, & Turner, 2000; Hogg & Terry, 2000; Reynolds, Turner, & Haslam, 2003). The impact of self-categorisation in relation to team formulation is yet to be explored.

Time for the team to reflect on care and treatment planning by formulating as a team is also identified as a key theme within the included studies. However, from the included studies suggesting that team formulation confers this time for reflection, there is no examination of whether team formulation is the only or most appropriate method of team discussion for improving treatment planning. Research with mental health multi-disciplinary team meetings has also shown an association between the meeting process and effective treatment planning (Raine et al., 2014). In order to understand the value of team formulation as a mechanism for this, further research targeting whether teams have increased reflection time specifically because of team formulation should be undertaken. This also applies to the fourth theme identified, where team formulation was perceived as a good tool for helping teams struggling with patient behaviours. Knowing the specifics of what it is about team formulation that leads to this perception; above other forms of team discussion is needed to strengthen this claim.

Within the included studies, the ability of team formulation to reduce patient behaviours that challenge due to altered staff perceptions of the patient seems largely to be an opinion and claims of this outcome require consideration in conjunction with study design and limitations. To illustrate this, the study by Ingham (2011), used an idiosyncratic observation measure of a patient's challenging behaviours over time, before the introduction of formulation and after it.

However, this measure was not validated and inter-rater reliability not assessed. The study may have been subject to high levels of bias given its design (Goodacre, 2015), and observed changes in the patient's behaviour could have been due to other factors such as medication or recovery.

The perception that team effectiveness increases because of team formulation was inferred as a finding, but not directly tested in three of the included studies (Christofides et al., 2012; Ingham, 2011; Revolta et al., 2016). Research into team effectiveness is extensive and includes factors such as team cohesion, participation, member attitudes to the team and clarity of objectives (Borrill et al., 2013; Richter, Dawson, & West, 2011). None of these factors were examined in the studies reviewed and therefore the impact of team formulation on team effectiveness must largely be seen as an untested assumption.

Overall, the findings of the fourth review aim suggest a growing interest in the impact that team formulation may have on a team. Findings suggest that it can help increase a team's emotional awareness and ability, while helping them to operate more efficiently. If these are potential impacts then the use of team formulation may herald a new way forward in promoting team effectiveness. However, present research is limited in the number of studies, quality and design and cannot be considered as reliable evidence of this impact.

*Limitations.* The decision to limit the review to studies published in peer reviewed journals, accessible by academic database was taken in order to focus the review on the most robust available evidence. This is in keeping with guidance on evidence based healthcare (National Academy of Sciences, 2001; NICE, 2014b). This is important as the practice of team formulation is increasingly used to plan care decisions; a crucial aspect of care. The inclusion of only ten studies for analysis, although potentially affecting the ability to answer the review aims, did ensure that only robust evidence was included. However, this may have limited the

ability to answer the review questions with assurance. Studies published within non-peer reviewed professional forum magazines and those not accessible by academic database would have increased the available number of studies amenable to review, but may have reduced the credibility of evidence. To mitigate further against the small number of studies reviewed, a robust methodology using PRISMA guidelines (Moher, Liberati, Tetzlaff, Altman, & Grp, 2009) was employed including the use of a second reviewer for quality appraisals.

The included research studies were variable in research aims, design, methodology, reporting, statistical analysis, sample size, and type. This heterogeneity prevented the use of one type of review analysis such as meta-analysis or qualitative evidence synthesis. Therefore, an accepted review style that could analyse the contribution of both quantitative and qualitative findings, and include the use of quality appraisals was used with rigour (Hong et al., 2017). This style limited the statistical analysis of quantitative findings, but did consolidate all kinds of evidence into a format by which the review aims (three and four) could be addressed. A second reviewer, who independently generated themes relating to the review aims, strengthened the approach.

## **Conclusions**

This review found a paucity of research studies. The quality of included studies was variable and their mixed focus considerably restricts the degree of evidence behind the practice of team formulation. Yet this is a promising approach that may impact beneficially on teams as well as conferring clinical benefits via individualised care planning and increased understanding of patients. Specific aspects, which remain poorly understood, include the influence of the team on the formulation and the influence of formulating as a team on the team. The untested assumption about team formulation that it can be suitably and wholly underpinned by therapy formulation theory, is likely to continue until team formulation is

clearly defined within its own right as a team psychological activity. A conceptual framework, which informs systematic consideration of the range of factors and theories involved in team formulation, which takes into account the team inputs, processes, and outputs, of formulating as a team, should inform future research. Such a guiding conceptual framework would highlight the possibilities for future research as abundant. Lessons can be gained from therapy formulation in this respect. The evidence for therapy formulation is also considered weak, however it is drawn from sound case observations, together with general theories, which in combination produce testable theories specific to therapy formulation (Bieling & Kuyken, 2003).

Defining and increasing the evidence base for team formulation remains a challenge, but represents a worthwhile one if the benefits to teams as well as patients are to be firmly established.

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