Systematic Review of Team Building Interventions

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Martin Riis Kastrup
Studienummer: 20146597

Abstract

In this paper I conduct a systematic review of team building interventions in order to answer how team building can help teams become more effective. The search was conducted on PsychInfo, EbscoHost and Scopus, and it returned 296 hits of which 56 was read in full length. Overall 19 studies were included in this review. The synthesis reveal that the overall designs span various combinations of diagnosis, goal-setting, role clarification, interpersonal relations, problem solving and implementation. Each of these can be implemented in many different ways and combined in multiple combinations with other elements. Turning to effectiveness it is defined as comprising performance, attitudinal and behavioral outcomes. It was found that teams can become more effective in terms of attitudinal outcomes, but mixed results are indicated for behavioral and performance outcomes. Additionally, mixed results were found for long-term outcomes, which indicate that teams not necessarily become more effective in the long run by participating in team building.

Table of Contents

1. Introduction

In this paper I will systematically investigate how team building has been studied and what can be learned from this in terms of developing effective and viable teams. The motivation for this paper follows several lines of thought that goes in different directions, but all took part in leading to this paper. I will here invite the reader on my journey to this particular review. First of all, I have an interest in and desire to work with team building in the future. I was therefore curious to know how different people had executed team building in various contexts. As I started my research journey, I started to find reviews and meta-analyses on various team interventions that only described some brief categories of intervention types and specific modes of action. For example, McEwan et al (2017) in their meta-analysis distinguishes between four types of training: classroom education, workshop, simulation training and team reviews in real life situations. The authors use these types to categorize studies on effectiveness of team interventions. However, they note that there exist lots of variation within these types:

> "…although it is evident that workshop-type activities are effective overall, it is unclear if specific workshop activities are more effective than others" (p.18)

It is clear that in order to gain enough statistical power the authors lose some of the complex picture of team interventions. Additionally, in their paper we gain a classic meta-analytic perspective on this matter. A lot of different numbers from lots of different studies that helps us digest the big picture. However, I will use this limitation as a starting point to go beyond these statistical numbers and dive into qualitative and quantitative studies of team building interventions in order to gain a more detailed picture of how team building can be conducted. Hence, by leaving out the meta-analysis I can instead focus more intensively on the synthesis.

Another paper that sparked my interest was Mathieu et al (2008) that made a narrative review of the development in team effectiveness research from 1997 to 2007, building on a previous review by Cohen and Bailey (1997) of the time period 1990 to 1997 (To my knowledge no one has made an updated review on the time

period from 2008 to today). Parts of these reviews concentrate on team building as an input to developing team effectiveness, but it is not the sole focus of these papers which leaves room for a review that specifically focuses on team building as an input factor for developing team effectiveness. In addition to this these two papers do not build on a transparent search process but instead relies on the expertise of the authors. In this paper I will make use of a systematic search to gain a full picture of the available literature.

When we look beyond these two contributions the current reviews specifically on team building are Lacerenza et al (2018) that reviewed four types of team development including team building. This review was narrative in nature and focused exclusively on developing a brief overview of theoretical developments in the field. Another paper is Rovio et al (2010) that made a narrative review that focused on teambuilding in sport in the period of 1997-2008. A third paper is Miller et al (2018) that make a systematic review of team building in non-acute health care settings. A fourth paper is De Meuse and Liebowitz (1981) that makes an attempt to systematically reviewing studies on team building from 1960 to 1980 focusing on intact teams and the organizational context. It is clear from this that the existing reviews focus on a narrow field excluding team types and contexts. Additionally, all but Miller et al (2018) are having more than 10 years old searches. It therefore seems reasonable to make an updated review that focuses on all contexts.

In this paper I will move away from the narrative review style and conduct a systematic review that will help to develop a transparent and systematic assessment to the benefit of the reader. Additionally, I will focus on a wider context and therefore investigate the following research question:

> How can team building help teams become more effective?

It follows implicitly from this research question that I have certain interests for this paper that can be expressed through PICO (Population/problem, intervention, comparison, outcome) or PICo (population/problem, interest, context). The former is the original which is used for quantitative papers. The latter is used for qualitative studies. Normally systematic reviews use one or the other. However, in this paper I

am interested in both types of data and therefore it seems relevant to specify my research in terms of both.

For both types the ***population*** is teams. Teams can be defined in numerous different ways (Mathieu et al, 2008, p.411). In this paper I try to adapt the widest possible definition of teams in order to include as many studies as possible and in order to be open for how the world is portrayed in the studies. I will here draw on Kozlowski and Ilgen's (2006) definition but change it slightly because it tends to lean more towards defining work teams. A team is therefore defined as two or more individuals, that socially interact to perform relevant tasks, that demand interdependencies for workflow and outcomes (I.e. they need to collaborate in order to reach a common outcome(s)) (paraphrase p.79). Apart from removing the phrases that bind it to an organizational context I disagree in regard to two elements of their definition that I therefore disregard in my definition. These are that the individuals must possess at least one common goal and that they have different roles and responsibilities (p.79). For the former part I believe it increases the effectiveness and teamwork if the individuals share a common goal. However, I recognize that some individuals are drawn together in teams where each member have different goals while working on common outcomes. With regard to the latter I believe some teams can exhibit shared roles and responsibilities and therefore both these parts will exclude teams that exist in the real world and I therefore disregard them.

The ***interest*** is how team building can create viability and effectivity. Thus, the ***intervention*** is team building. However, it needs to be clarified how team building is defined. Apart from team building several other words has been used like development, training and intervention. I have had a look at how authors define these words. Closely related to team building is what Shuffler et al (2011) refer to as team training. For the authors this is more about development of competencies or skills that enables teams to perform better. This mainly focus on the development of knowledge, skills and attitudes (KSA) (p.368). This is a concept that is often referred to when talking about various forms of team interventions directed towards work teams in business. For example, Salas et al (2012) refers to KSA when defining training directed towards interventions in organizations (p.77) and Mathieu et al (2008) also uses KSA to define interventions directed towards teams (p.447). Some papers though, do not define what is meant by team intervention at all (E.g. Körner et al, 2016; McEwan et al, 2017). However, it seems that team intervention in general is used to describe the

development of KSAs but not exclusively. What I will call 'hard' dimensions of teamwork because these encompass some general skills that enable teams to conduct certain tasks. On the other hand, team building seems to refer to 'soft' dimensions of teamwork that enable teams to function well together *and* work towards common goals.

If we turn to team building there is a tendency for it to be used in relation to sport (Rovio et al, 2010), but not excluded to this context. Other examples are health care (Miller et al, 2018) and business (Shuffler et al, 2011; Salas et al, 1999). From this it seems that team building is not only used in sport as might be assumed in folk psychology, but also in various other contexts. If we look at how these papers define team building it is done in similar veins. It is concerned with team functioning (Miller et al, 2018, p.2) as well as development of social relations and interactions (Shuffler et al, 2011, p.368; Salas et al, 1999, p.265). All three papers highlight some of the same elements (E.g. Goal setting, role clarification, improvement of interaction). Rovio et al (2010) end up with a similar definition but highlights that a lot of different definitions exists with no consensus currently. However, Rovio et al (2010) ends up summing up all definitions to a similar definition as the above authors:

> "…it can be concluded that the purpose of team building is to "promote and enhance the effectiveness of a group," and that such enhancement can be "made through task- (e.g., goal-setting, role clarification etc.) or through group/relationship-oriented (e.g., interpersonal-relation schemes, problem solving etc.) approaches"…" (p.12)

The distinction between task- and relational-oriented approaches helps differentiate between different approaches or types of team building interventions. However, these two categories have two examples each but ends with etc. That gives some expectations of a potential infinite amount of types in the two categories. Thus, I investigated it further to gain more clarity. Helpfully Lacerenza et al (2018) have described it further and divides team building into four approaches: goal-setting, interpersonal-relations, role clarifications and problem solving (p.523). These same approaches are recognized by Tannenbaum et al (1992) (p.119-120). It is clear that

these encompass the four examples described by Rovio et al (2010). Hence, I will follow the definition from Rovio et al (2010) and have two categories with two subtypes. These four subtypes might be self-explanatory but further clarity can be added to the relational-oriented approaches. Rovio et al (2010) describe interpersonal-relation schemes as helping teams developing the interpersonal relations. Examples of this include development of norms, communication, help with emotions, etc. (p.9). Lacerenza et al (2018) further describe it as the process of developing trust and resolving conflicts (p.523). If we turn to problem solving it deals with problems the team experience in relation to tasks. The intervention centers on helping to identify and solve the problems through facilitation of decision-making processes (p.523; Rovio et al, 2010, p.10). Hence, problem solving is not about developing task related skills but about developing the team's ability to solve task related problems for example through better decision-making. It is evident from above that the same elements surface in the understanding of team building and both Lacerenza et al (2018) and Rovio et al (2010) help to divide the approaches into meaningful categories and subtypes that I will make use of. Therefore, I define team building as a form of intervention that intends to promote effectiveness in teams through task-oriented (goal-setting, role clarification) and/or relational-oriented (interpersonal relations, problem solving) practices.

The term ***comparison*** in PICO is not relevant for this study because I do not intend to exclude papers that do not use a comparison group nor the other way round. The same goes for the term ***context*** in PICo which is not further defined because I intend to include several different contexts in this review. The ***outcome*** is here understood as team effectiveness in line with several reviews (Cohen & Bailey, 1997; Mathieu et al, 2008; Pina et al, 2007). Team effectiveness has been operationalized in many different ways (Pina et al, 2007, p.8). However, Mathieu et al (2008) notes that it is the least studied aspect of teams. This is mainly due to issues of measurement (p.415). It might prove a problem for this review that outcomes seem to be the least researched area of teams. Due to this I will be open for different types of measures but in order to make outcomes clearer and to increase the understanding of team effectiveness I will employ the categorization from Cohen and Bailey (1997). This is done because two reviews (To my knowledge the newest) of team effectiveness support this categorization. It consists of performance outcomes, attitudinal outcomes and behavioral outcomes (Mathieu et al, 2008, p.415; Pina et al, 2007, p.8; Cohen &

Bailey, 1997, p.244). Performance outcomes is assessed by measures of quality and quantity. This can be measured in various ways like customer satisfaction or response time. Attitudinal outcomes refer to team member satisfaction, commitment or trust. Behavioral outcomes are measured in terms of turnover, safety and absenteeism (Cohen & Bailey, 1997, p.243; Pina et al, 2007, p.8).

While not commentating on Cohen and Bailey's (1997) categorization Kozlowski and Ilgen (2006) suggest a similar categorization which consist of performance, meeting team member needs and viability. The authors suggest that performance should be judged by relevant others outside the team (p.79-80). This formulation seems more open for more subjective evaluations from outsiders than Cohen and Bailey's (1997) categorization, but not necessarily open to subjective evaluations from team members. When it comes to the two latter elements of their categorization there seems to be some overlap. Viability is described as: "… the willingness of members to remain in the team" (Kozlowski & Ilgen, 2006, p.79). If the needs of members are met this must relate to their willingness to remain in the team and vice versa.

This categorization is therefore seen as unnecessary confusing and since there seem to exist some form of consensus that Cohen and Bailey's (1997) categorization is appropriate I will use this to group various findings in this review. Additionally, it gives room for fitting different types of measures into this review. However, Kozlowski and Ilgen (2006) put attention to the word viability, which Cohen and Bailey (1997) refer to only indirectly in the attitudinal category and to some extent in behavioral outcomes. I believe this aspect is important when considering team building because a team that perform but that is not viable will not be expected to last very long. A similar point is made by Bell and Marentette (2011, p.278). Additionally, team building will be used for several different contexts including less performance-oriented contexts where it is important to develop viable teams that has the potential to last. This aspect might also influence performance outcomes simply due to increased happiness and less conflicts in the team. Yet, there does not exist consensus on how to define viability (Mathieu et al, 2008, p.418; Bell & Marentette, 2011, p.276-277). The former authors review contributions to and uses of viability and finds many different definitions and operationalizations of the concept. It must therefore be expected that several different ways of operationalizing outcomes that resemble viability will exist in the included studies. However, the authors suggest a definition upon their review:

"We define team viability as the team's capacity for the sustainability and growth required for success in future performance episodes.". The idea behind this definition is that if teams want to be effective, they need to be able to stay together over time and grow accordingly. The latter part of the definition reflects the ability of the team to respond to changes and grow when needed (p.277-280). To conclude I will in this paper make use of the categorization between performance outcomes, attitudinal outcomes and behavioral outcomes in the synthesis. The PICO and PICo are summed up in Table 1 below.

Population	**Interest/intervention**	**Comparison/context**	**Outcome**
Teams: Two or more individuals, that socially interact to perform relevant tasks, that demand interdependencies for workflow and outcome(s)	How team building can create viability and effectivity. Team building: Task-oriented approaches (goal-setting & role clarification) & relation-oriented (interpersonal-relations & problem solving)		Performance outcomes (subjective & objective measures), attitudinal outcomes (satisfaction, commitment, trust), behavioral (turnover, safety, absenteeism)

Table 1: PICO & PICo

2. Method

2.1 – Systematic Review

A systematic review is a transparent and systematic assessment of the studies that fit the research question and the specified search criteria. This review type is one among many different review types. Grant and Booth (2009) describes 14 review types, where among systematic review is mentioned. Alternatives to this type for example include the narrative review (Utilizing the author(s) expertise. No formal search process), rapid review (Systematic search constrained by time), scoping review (Preliminary search) or umbrella review (Compiling multiple reviews). The essence of systematic reviews is described by Grant and Booth (2009) as:

> "Gathering research, getting rid of rubbish and summarizing the best of what remains..." (p.92)

Originally this idea was pinpointed by James Lind in the 18th century, according to Grant and Booth (2009), in order to summarize randomized controlled trials (p.92; Chalmers et al, 2002, p.13f). From there several different authors made claims that resemble Linds idea, referring in principle to the quote above. Though, according to Chalmers et al (2002) we didn´t see systematic review approaches resembling what exactly is known by a systematic review today, before the 20th century. During this period, we saw different authors within different disciplines using a systematic approach to review the knowledge base through literature search, quality assessment and synthesizing of data (p.13-15). (Please see Chalmers et al (2002), for a comprehensive review of the historical development of the systematic review). However, it was not before 1992 that a combined effort to standardize the systematic review approach was made by the organization of the Cochrane Collaboration. In this case for use in health care literature (Grant & Booth, 2009, p.92). Chalmers et al (2002) and Dixon-Woods et al. (2006) notes that one of the driving forces has been an increasing need for evidence among policy makers but also for practitioners (p.26-28; p.28). Indeed, this helps everyone interested in academic knowledge to stay up to date with the accumulating knowledge base. This is one of the advantages of the systematic

review which deals with the problem observed by Glass in 1955 “no problem facing the individual scientist is more defeating than the effort to cope with the flood of published scientific research, even within one’s own narrow specialty” (Salas et al, 2008, p.911). By inspiration from Chamlers et al (2002), let’s conclude with the definition of systematic review from the *Dictionary of Epidemiology (5th edi. 2008)*:

> “The application of strategies that limit bias in the assembly, critical appraisal, and synthesis of all relevant studies on a specific topic. Meta-analysis may be, but is not necessarily, used as part of this process.” (p.268)

2.2 – Search Criteria

In the development of a search approach I used former reviews on team building as inspiration. In general the picture that emerged was that search terms can be divided into four groups: a) words referring to the team (e.g. group, interdisciplinary, interprofessional, crews); b) words referring to interventions (e.g. training or teamwork training, building, teamwork, team improve(ment), team development); c) words referring to the specific context and d) words referring to models of teamwork. The last two groups of search terms will not be used for this paper because I don’t intent to exclude any contexts and I don’t intend to look for specific models or elements of models.

Due to time constrains I have decided to limit my search in two respects. The amount of data is one of the challenges for reviews and therefore the search needs to fit the amount of resources. I have tried to balance this while still retaining the relevant studies among the hits. First, I have constrained the search by reducing the words for group to only team. I have done this because it is the most relevant word when discussing team building. As of jet I have not seen any paper using the phrases like crew building, group building or interdisciplinary building. Next, I have decided to limit the search to titles because a test search with abstracts yielded more than 3000 hits. Furthermore, it is to be believed that relevant studies will include a specific name for their intervention in the title. Therefore, it is reasonable to believe that relevant studies will not be excluded due to this.

Contrary to these constrains I have decided not to reduce the number of words for intervention because papers use a lot of different words for this while referring to different content of the intervention. It seems like there is no fixed used of the words for intervention and I expect several relevant studies to be excluded if a variety of words for intervention is not employed. The following search string has therefore been employed for this review:

“team* intervention*” OR “team* development" OR “team* improvement" OR “team* building” OR “team* training” OR "team-building intervention"

In order to narrow the hits down further, I have used relevant search indexes on each database, if possible. These will appear on appendix 1 in order to make the literature search as transparent as possible. The databases that I will include in this paper will be PsychInfo (includes a wide extract of psychological articles), EbscoHost (covers sport, business and education) and Scopus (covers business and psychology).

2.3 – Selection Criteria

This systematic review has the following five inclusion criteria:

A) First of all, the study must be published in a peer-reviewed journal. I use this criterion as a first step in the quality appraisal process.
B) Secondly, the study must only include an adult population (at least 18+ years), because there might be a difference from adults to children. This systematic review does not intent to gather any information about children and will therefore only include adults.
C) The third criterion is that the paper is in English.
D) The fourth inclusion criterion is that the object of the team intervention is a group of people, and not only an individual or fraction of the group. This criterion is adopted from Rovio et al (2010) (p.3) and Salas et al (2012) (p.79) that both distinguishes between intervention directed towards enabling the individual to become better at participating in teams and intervention directed at making the team more effective as a whole.

E) The fifth criterion is that the purpose of the team intervention is to improve team effectiveness.

The following three criteria are excluded:

F) Interventions that focus on the organizational level and not group level.

G) Interventions that *only* focus on developing the team leader.

H) Interventions that focus on groups of exercisers that only constitute a group when they met in the gym or elsewhere to participate in a class for exercise.

2.4 – Procedure

The process for this systematic review has consisted of a long preliminary phase. This is due to the enormous size and complexity of the field of team research. I will try to give an insight into this preliminary process in order to make this paper even more transparent than just the unravelling of the search and selection process. In the beginning I tried to gain as much knowledge about research themes of teams and especially for various team interventions. I used several different scoping searches in order to capture the main review articles relevant for this theme. For example, I searched for reviews and meta-analyses in combination with team* and gained about 250 hits. However, later on I have found that this did not give me all the reviews around. I did two searches later that yielded several more relevant papers. I conducted citation searches for Salas and Cannon-Bowers (2001) and Mathieu et al (2008). The reasoning behind this was that the former article is part of a series of reviews that span a decade each on training in organizations (e.g. team interventions). However, all former articles in this series had different headings making it impossible to find the next article. Therefore, I had to look among papers that cited the original paper. This yielded about 500 hits which I scanned for +20 citations (I.e. every paper with more than 20 citations was checked). This search contributed with some 40 relevant articles. The latter search was done because Mathieu et al (2008) is part of a series of two review on team research that are both very thorough. Again, the same problem occurred with different headings. Unfortunately, this search and additional different tries did not yield any indications of a newer review in this series. However, the search again yielded about 500 hits and some 10 articles were relevant for this paper. Before the systematic search I have relied on reviews and meta-analyses because these gives the best overview of the literature without having to go through several hundred studies

or theoretical outlines. The next part will go in depth with studies that match the search and selection criteria.

The selection of papers followed the guidelines for PRISMA (Perestelo-Perez, 2013). *First*, I formulated the research question via my interests in teams and the various review papers that gave me an idea of the current status of the field. Both the PICO and PICo has been elaborated in the introduction, which is needed for the first step. The *second* step has been to define the search and selection criteria. The *third* step has been to screen the yielded results. However, due to only having one author for this paper it is a limitation that the screening process was only done by one reviewer and not two as recommended by the PRISMA guidelines. The search was done the 26th of March. Initially the screening was done by screening the titles and abstracts for relevance. Thereafter all selected articles were screened in its full length in order to assess its relevance. The exact numbers for each step can be seen in figure 1 below. The *fourth* step involved critical appraisal of the included articles. The method for this appraisal is outlined below. The *fifth* step involved data extraction whereby I tried to give the reader an overview of the included articles. The *sixth* step involved the actual analysis and synthesis of the included papers. The synthesis method is also outlined below. The *seventh* and final step involves a discussion and interpretation of the findings (p.51-55).

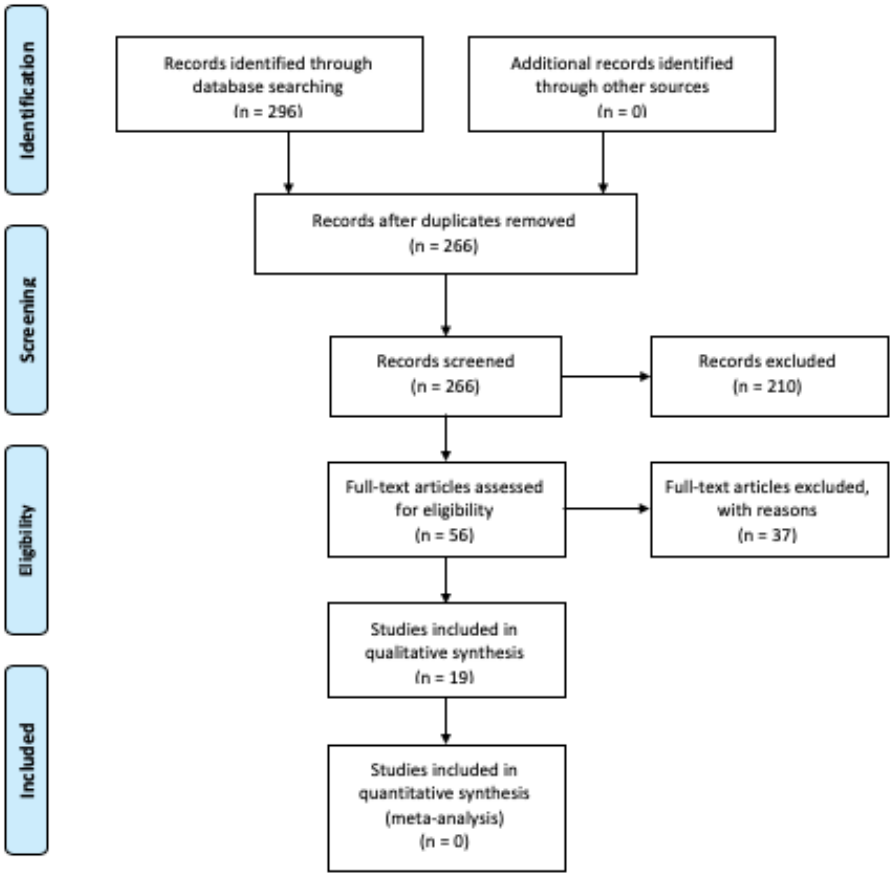

Figure 1: From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

The following explain reasons for excluding papers. Eleven articles did not conduct any team building intervention (Aga et al, 2016; Chekwa & Thomas Jr., 2013; Crase & Hardy, 1997; Gorman et al, 2016; Grzeda et al, 2008; Naber et al, 2015; Packard et al, 2006; Riener & Wiederhold, 2016; Walsh et al, 1995; Yi, 2016; Zucchero, 2016), six articles were not available (Ammeter & Dukerich, 2002[1]; Holt & Dunn, 2006[2]; Johansen & McLean, 1995[3]; Kormanski, 1990[4]; Miyake, 2016[5]; Robinson-Kurpius et al, 2004[6]), four articles studied leader training (Currie, 1994; Gabrielsson et al, 2009; Harrison & Pietri, 1997; Keddy & Charlesworth, 2008), three articles investigated KSA (Clay-Williams et al, 2013; Rentsch et al, 2010; Wallin et al, 2015), three articles investigated interventions at the organizational level (Appelbaum, 1991; Appelbaum, 1992; Buller & Bell Jr., 1986), three articles

[1] Title: Leadership, team building, and team member characteristics in high performance project teams
[2] Title: Guidelines for Delivering Personal-Disclosure Mutual-Sharing Team Building Intervention
[3] Title: Team building in a public-school system: An unsuccessful intervention
[4] Title: Team building patterns of academic groups
[5] Title: Hedgehog: Team building system estimating effectiveness of team
[6] Title: Team building for nurses experiencing burnout and poor morale

described theoretical considerations (Darling & Heller, 2012; Dwivedi & Kumbakonam, 2002; Saenko et al, 2018), two articles investigated perceptions of team building (Potnuru et al, 2019; Sulaiman et al, 2012), two articles investigated how team building could help people stay at physical activities (Estabrooks et al, 2008; Forrest & Bruner, 2017), two articles studied populations that are too young for this paper (Kim et al, 2017; Senecal et al, 2008), one paper studied team formation (Ciasullo et al, 2017).

2.5 – Critical Appraisal

Critical appraisal is the process whereby the reviewer evaluates the quality of the included studies in order to determine its usefulness (Hong & Pluye, 2018, p.2). The choice of appraisal method is an important part of the systematic review because it makes the process transparent, systematic and reproducible (Hong et al, 2018b, p.460). However, it is also the area of systematic reviews that has the most options. Hence, it is difficult to argue for a specific appraisal tool. Some reviews of appraisal tools for qualitative and mixed-methods exist (e.g. Santiago-Delefosse et al, 2015; Heyvaert et al, 2013). Up until now systematic reviews that uses different data types has had to employ appraisal tools for the specific data type (Heyvaert et al, 2013, p.316-317). However, recently Hong et al (2018b) have developed a 'multi' appraisal tool called Mixed Methods Appraisal Tool (MMAT), that enable the reviewer to appraise different types of data with the same tool. The authors have worked on this tool since 2006 and have released it in two different versions (2011 and 2018) (Pluye et al, 2009; Pace et al, 2012; Hong et al 2018c). There are available resources (Excel sheet, descriptions, etc.) which will be used for this review[7]. Apart from leaving the choice of appraisal method to the reviewers the administration of an appraisal tool will often times also be a matter of the reviewers' subjective evaluation. Thus, it is not always clear-cut decisions (Hong et al 2018c). Accordingly, the developers of the MMAT also recommend not to exclude low quality studies but rather to discuss the studies and their methodological issues (p.1), which I will do in this paper if the paper has a low quality. The following table describes the evaluation questions for each data type respectively. The full evaluation for the included papers can be found in appendix 2.

[7] http://mixedmethodsappraisaltoolpublic.pbworks.com/w/page/24607821/FrontPage

Category of study designs	Methodological quality criteria	Responses			
		Yes	No	Can't tell	Comments
Screening questions (for all types)	S1. Are there clear research questions?				
	S2. Do the collected data allow to address the research questions?				
	Further appraisal may not be feasible or appropriate when the answer is 'No' or 'Can't tell' to one or both screening questions.				
1. Qualitative	1.1. Is the qualitative approach appropriate to answer the research question?				
	1.2. Are the qualitative data collection methods adequate to address the research question?				
	1.3. Are the findings adequately derived from the data?				
	1.4. Is the interpretation of results sufficiently substantiated by data?				
	1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?				
2. Quantitative randomized controlled trials	2.1. Is randomization appropriately performed?				
	2.2. Are the groups comparable at baseline?				
	2.3. Are there complete outcome data?				
	2.4. Are outcome assessors blinded to the intervention provided?				
	2.5 Did the participants adhere to the assigned intervention?				
3. Quantitative non-randomized	3.1. Are the participants representative of the target population?				
	3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure)?				
	3.3. Are there complete outcome data?				
	3.4. Are the confounders accounted for in the design and analysis?				
	3.5. During the study period, is the intervention administered (or exposure occurred) as intended?				
4. Quantitative descriptive	4.1. Is the sampling strategy relevant to address the research question?				
	4.2. Is the sample representative of the target population?				
	4.3. Are the measurements appropriate?				
	4.4. Is the risk of nonresponse bias low?				
	4.5. Is the statistical analysis appropriate to answer the research question?				
5. Mixed methods	5.1. Is there an adequate rationale for using a mixed methods design to address the research question?				
	5.2. Are the different components of the study effectively integrated to answer the research question?				
	5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted?				
	5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?				
	5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?				

Table 2: Adapted from: Hong et al (2018) (p.2)

2.6 – Synthesis Method

Synthesis method is a process of combining, summarizing and integrating outcomes from the included studies (Perestelo-Perez, 2012, p.55). There exist several different methods for this and the choice of method depends on the aim of the review. In general syntheses methods have been referred to as being either interpretive or integrative in nature (Noblit & Hare, 1988: According to: Dixon-Woods et al, 2005, p.46). Generally, integrative synthesis methods focus on aggregating data while interpretive methods tend to focus on interpretation and development of new understandings. Originally these methods have been identified with either quantitative date or qualitative data respectively (Dixon-Woods et al, 2005, p.46). However, Dixon-Woods et al (2005) goes beyond this distinction and distinguishes these two categories on behalf of their aim. The overall aim of integrative approaches is to summarize data while for interpretive it is to develop concepts or theory. It also follows from this that both quantitative and qualitative data can be used to inform both synthesis approaches (p.46). This understanding has also been adopted by the Cochrane Collaboration (Noyes et al, 2008, section 20.3.2.3). It is worth noting that Dixon-Woods et al (2005) emphasize that these two categories are overlapping because all types of syntheses will have elements of both interpretation and aggregation of data (p.46). Examples of interpretive methods are meta-study, meta-ethnography and grounded theory (Barnett-Page & Thomas, 2009, p.2-3). Examples of more integrative methods are qualitative metasummery (Sandelowski et al, 2007), framework synthesis (Barnett-Page & Thomas, 2009, p.5) and meta-analysis (Dixon-Woods et al, 2005, p.36).

Another way of categorizing synthesis methods is between aggregative and configurative methods. The former category contains syntheses methods that focus on pooling the findings together and depend on these being relatively similar. Examples would be meta-analysis or meta-summary. Configurative synthesis methods aim to compile different themes of findings that are dissimilar but related and therefore potentially can be used to "… contradict, extend, explain, or otherwise modify each other" (p.25). Examples are grounded theory or meta-ethnography. It naturally follows that configurative methods relies more on the reviewer. Sandelowski et al (2012) refers to it as *meshing* the findings and use the metaphor of the creation of a mosaic. The opposing idea relies on the reviewer to *merge* findings rather than meshing them (Sandelowski et al, 2012, p.323-327). This categorization leans much towards to the former division between integrative and interpretive, where integrative is similar to aggregative methods and interpretive is similar to configurative methods.

The choice of synthesis method will naturally form the analysis, but some methods tend to give similar conclusions. For example, Lucas (2007) made two syntheses on lay perspectives of infant size and growth and found that the thematic and textual narrative syntheses, respectively gave the same conclusions. However, both methods of synthesis had different strengths and limitations (p.4). On the other hand, the results from most analyses will be formed by the choice of synthesis method. For example, qualitative metasummary is used to quantify qualitative findings from interviews and quantitative findings from questionnaires (Sandelowski et al, 2007). In comparison the use of grounded theory will focus on developing new theories (Barnett-Page & Thomas, 2009, p.2). Naturally, it follows that these synthesis methods suit some research questions better than others.

In this paper I have decided to include both quantitative and qualitative data, even though this is a contested area for systematic reviews (Dixon-Woods et al, 2005, p.51). In general, the idea of synthesizing quantitative, qualitative and mixed-methods studies is relatively new, and work on furthering the guidelines on this area is currently under way. For example, the Cochrane Strategic Methods Fund has started a 23 months project called ICONS-Quant, that focuses on developing guidelines for the use of narrative synthesis of quantitative data (Campbell et al, 2017, p.2). However, the use of both data types holds promising potential for compensating each other's shortcomings (Barbour, 1998, p.356-357; Heyvaert et al 2013, p.316). Hence, the intention is to use both data types, because both can give valuable insight into how

team building can develop effective and viable teams. In addition to this, many of the relevant studies used mixed methods and excluding these would miss relevant knowledge. Thus, in an ideal world it would be possible to have a review that encompassed one type of data only. For this review though, it has not been possible to establish enough studies to make this distinction. In addition to this matter, the quantitative measures in the included studies are all different from one another and it is therefore deemed impossible to conduct a meta-analysis, because different measures cannot be pooled together in a meta-analysis (Dixon-Woods et al, 2006, p.12).

Even though synthesis of mixed-methods is not well developed some authors have proposed different approaches (Heyvaert et al, 2011, p.15). Two different but similar categorizations have been made. Sandelowski et al (2006) describe mixed research synthesis which aims to integrate the findings from quantitative, qualitative and mixed method studies. The idea is that both qualitative and quantitative data types can be used to answer a research question or clarify a specific phenomenon (p.35). They divide it into three overall synthesis designs: segregated, integrated and contingent. Segregated refers to having two parallel syntheses that analyze quantitative and qualitative data separately and then synthesize the two syntheses afterwards. Integrated refers to one synthesis where the two data types are integrated either by 'quantitizing' qualitative data or 'qualitizing' quantitative data. Hence, a transformation of data is needed. Contingent refers to a cycle of systematic review which answers new research questions until a comprehensive synthesis has been reached. This design can make use of either the integrated or segregated design (p.32-36). These synthesis designs are similar to the more fine-grained division by Hong et al (2017) who call it result-based and parallel-results convergent (=segregated), data-based convergent (=integrated) and sequential (=contingent) (p.10).

I will use the integrated / data-based convergent synthesis design and qualitize the quantitative date to create themes. It is still relatively unclear how authors specifically should conduct the process of qualitizing. Sandelowski et al (2006) who suggest the possibility do not describe the process in detail. However, Nzabonimpa (2018) describes more in depth how authors can work with qualitizing. The approach is about turning numbers into words which can be turned into themes and mapped against the qualitative findings that in turn will contradict or support each other (p.3). It is clear that this process weakens the ability to generalize but, on the upside, it enables us to utilize the available data and develop insights from these that will help

us understand the field of team building better. Due to the lack of clarity of the process of qualitizing I will be hesitant of transforming the data too much from how the authors in each study interpret their own results. Typically, authors describe their quantitative data as either significant or not in statistical terms and these are often further interpreted in the discussion. I will rely on both in order to reveal how data are expounded in each study and thereby rely heavily on the authors own interpretations.

I will synthesize the data in a thematic analysis that will be used to develop various themes that emerge from the reading of the included studies. Similar to Rovio et al (2010) these will be developed as the analysis unfolds and therefore give room for reflection upon the studies (p.3). Hence, the process will lean towards a more informal thematic analysis that through several readings of the included studies refine the findings and integrate these into key themes (Bearman & Dawson, 2013, p.254). In general, this synthesis method gives a lot of flexibility to the researcher and therefore also leaves room for critique. Dixon-Woods et al (2005) raise several points that are uncertain about this method. In general, the lack of a systematic approach for theme development makes it unclear whether the synthesis is driven by themes developed on the basis of theory or data. Thus, let me clarify that I will let the data from the included studies drive the development of themes. The lack of a systematic approach also leaves doubt about whether it should be a descriptive or interpretive synthesis. It is clear that this is not methodologically defined, and, in this review, I will lean towards the descriptive approach but not exclusively, since there might be instances of unclarity that needs interpretation. In these cases, it will be evident from the synthesis in order to make it more transparent for the reader. An additional point is the question of whether frequency or more in-depth explanations should drive the formation of themes (p.47). It is obviously a question that is up for debate but if this review was merely interested in quantifying themes the idea that drives qualitative metasummary would be more suitable to the extent that data would deem it possible. Instead this review will adopt a pragmatic approach where both the frequency and in-depth explanations can be used to form themes. This reflects the intention to be open for phenomena that can be evident from one study as well as several more.

3. Synthesis

3.1 – Descriptive Data for Included Studies

In the following I will describe the included studies in order to give the reader a picture of what each study investigated and how this was done. Each study will be described in descending alphabetical order and follow the same structure. First, the purpose, context and participants are described. Second, the intervention and control condition (if applicable) are described. Third the outcome measures and the conclusions are described After these descriptions there follow a table with the most important information of each study.

Bayley et al (2007) conducted a longitudinal non-experimental study of a team building intervention directed towards health care professionals. The purpose was to investigate individual perceptions of teamwork after the intervention and to understand if this intervention was feasible. The participants were 11 teams ranging from 5 to 19 people including social workers, nurses, administration, leaders (p.189-192).

The intervention consisted of a two-day workshop. The intention was to give insight on people's behavior by providing information on roles, working styles, communication, problem solving and goal setting. Measures included were Myer-Briggs Type Indicator (personal preferences and communication), Belbins team roles and root cause analysis (p.189-190).

Three questionnaires were used for this study. The Team Development Measure (perceptions, processes), the Team Building Questionnaire version 1 (attitudes to course, implementation of lessons) and version 2 (teamwork, implementation). The first questionnaire was used immediately after the intervention, 3 months after and 6 months after. Version 1 was answered immediately after the intervention and version 2 was used 6 months after. Additionally, telephone interviews took place with one team member and the leader 6 months after the intervention (p.190-191).

The team building intervention indicated a short-term effect on team functioning and individual approaches to teamworking. However, any effect

diminished over time and had been lost 6 months after. There were only minimal improvements in communication (information sharing and conflict management), understanding of roles and working styles 6 months after the intervention. Additionally, the study found that organizational circumstances (work load, change, individual working patterns, financial and time constrains) affected the implementation of training. Hence, the study did not find any indications of improvements to productivity or effectivity perhaps due to organizational circumstances (p.192-199).

Birx et al (2011) conducted a non-experimental study on a group of nursing faculty employees to investigate the effects of team building. The purpose is not clearly stated but it is indicated that there is a need for keeping faculty members happy because there is shortage of nursing faculty available. It is also unclear which faculty is investigated and it is not declared due to anonymity. 29 faculty members participate voluntarily in the study. It was possible to participate in the activities while not participating in the study (p.174-176).

The intervention is a day of challenging activities that consist of different games that is meant to help the participants get to know each other. In the end each participant shares what they will bring with them from the day to their work. Before the intervention faculty members answered a demographic questionnaire, JDI (measure of job satisfaction) and the Group Cohesion Questionnaire (GCQ). After the intervention participants answered JDI and GCQ again, and open-ended reflection questions on the intervention. Additionally, the members reflected on the intervention immediately after and later on (p.174-176).

The results indicated significant increases in cohesion, satisfaction with coworkers and overall job satisfaction immediate after the intervention. However, these effects were vanished at the end of the semester. These quantitative findings were supported by the qualitative findings too (p.176-177).

Bottom and Baloff (1994) conduct a quasi-experimental study on team building using an IPO framework. The purpose is to study a theory driven intervention that diagnoses the various variables (composition, structure, resources, process, etc.) in the model. The participants were 144 MBA students that were randomly assigned to teams of 6 (In total 24 teams). In effect these teams were new and formed for this specific

purpose. These teams participated in a simulation game that consisted of 3 independent 'worlds' of 8 teams. The 8 teams competed with each other and not the other 16 teams. The simulation game is called Tycoon and consist of 8 companies with different histories that each team has to manage. One world was used as control and the two other worlds received treatments (Teams were randomly assigned to the three worlds) (p.320-328).

The intervention lasted for three days and included various interventions that aimed at targeting variables in the model. For day one and two the interventions are unclear, but day one focused on building open communication and supportiveness while day two aimed at decision-making, open communication and the role of individual inputs. The third day was used to target conflicts and role clarification through feedback exercises. This day the game was one third of the way and former experience indicated that conflicts arose at this point in time. The control condition received classroom lecturing in the same amount of time as the interventions. This included group decision making, problem solving, conflict and leadership (p.325-328).

The measures used for this study were questionnaires concerning open communication (TORI scale), conflict and role clarity. These were used one third into the game. After the game participants answered a questionnaire on satisfaction and performance. Additionally, the teams were also measured on five measures (return on resources, return on investment, market penetration, cost, attractiveness to market, standardized composite) of success in the game. (p.328). The team building groups showed significant improvement compared to control teams of seven out of eleven group-process measures (Trust, openness, realization, interdependence, social support, personal inadequacy, team effectiveness)[8]. Personal inadequacy indicates that team building groups were better to match personal resources with responsibilities. However, no significant differences were found between the intervention group and the control group on conflict, role ambiguity, resource inadequacy and role load. Participants in the team building group reported greater satisfaction with team performance than the control groups. Additionally, the team building groups were more supportive and communicated more openly than the control groups. Looking at the objective performance measures no significant difference was found between the intervention and control teams (p.328-332).

[8] In general, these concepts are not defined and must be interpreted through their intuitive meaning. However, realization cannot be readily interpreted

Bushe and Coetzer (1995) conducted a quasi-experimental study on appreciative inquiry as team building intervention. The purpose was to understand if appreciative inquiry as intervention is as effective as a traditional problem-oriented intervention. The participants are undergraduate students on an organizational behavior course. The study was implemented over two different semesters to get enough participating teams. One semester had 56 students divided in 14 teams that completed the whole intervention and the other semester had 40 students divided in 10 teams. Giving 8 teams for each condition and a total of 96 people. The life span of these groups are about 13 weeks (p.13-20).

The problem-oriented intervention used the form called TOTD which focus on developing clear goals, roles and procedures, and has a clear focus on problems. With this intervention form an assessment instrument follows that measure each members' perceptions of how good the group is doing on each of these three areas. The intervention starts by having the members filling out the instrument. These results will be visualized for the group and this is used to facilitate an open discussion on the ratings following the sequence of the three areas. The focus is particularly on differences in ratings and on those that are farthest away from the best case. The whole intervention ends with a plan of agreement. The appreciative inquiry intervention focuses on what members appreciate and find effective about their group instead of the problem focus seen above. Another difference is that this approach does not use existing theories to define how the group work effectively. Rather it gives room for the team to use its own experience to develop its own understand of effectiveness. As a control condition a presentation on group dynamics was giving. These three conditions followed the same overall structure: a) At week 5 of the semester every group answered a questionnaire to understand group processes. b) At week 7 (Half-way through the semester) teams are exposed to the intervention. c) At week 9 group processes are measured again. d) The teams present a case analysis which count towards their final grade. e) A final questionnaire to measure group performance at week 12 (p.14-20).

The measures for this study included measurement of participation, cohesion, conflict management, decision making and confidence in the team. The final measure (e) focused on satisfaction with membership and team performance. Apart from these a measure of task performance (grades) was used (p.20-21). The results

lend support for both interventions compared to the control group. On all measures but conflict management for the appreciative inquiry intervention and all measures for the intervention groups scored significantly higher (I.e. participation, confidence in team's ability, decision making, cohesion, task performance) than the control group. Additionally, the intervention teams experienced it as powerful and helpful, whereas the control teams experienced it as being ok. Hence, the results indicate that both interventions work but there exist no significant differences between the two interventions (p.21-28).

Clark et al (2002) conduct a non-experimental study on a team building intervention targeting clinical geriatric teams. The purpose of the study is to address questions regarding the content of team building training and the 'dose' or intensity of training (p.496). The study involves 8 different interdisciplinary teams with different compositions of physicians, nurses, social workers, pharmacists, dieticians and administrators. They range in size from 4 to 25 people and work at different non-profit organizations (e.g. community hospital, nursing home, mental health center, etc.). All teams participate voluntarily and are screened for their appropriateness for the training (p.497).

The intervention consisted of up to four elements but not all teams were exposed to every element. However, all teams were exposed to the first element. This element consisted of a one-day workshop which consisted of lecturing on teamwork, conflicts and leadership. At this workshop each team got an assignment for the coming year that involved roles, assimilation of new members, dealing with conflicts, taking on responsibilities, responding to changes and pressure. Before this workshop two instruments were used to gain insight on the team. These were the Strength Deployment Inventory (SDI) which assesses how each individual relates to other under conflict and when things go well. The other was the Team Signatures Technology (TST) that is used to measure the dynamics of the team and identifies patterns of behavior(s) that are characterized by its distinct properties (e.g. leadership, cohesion, etc.). The second element was a half-day follow-up workshop a year later. Only three teams were exposed to this. The other five teams did no longer exist in the original composition due to various reasons. This workshop was tailored to the team's needs. Additionally, the assignment was followed up. The third element consist of a half-day retreat that was held on request of some of the teams for those members of each team

that was interested. 22 people from different teams participated. This was used as an opportunity to discuss common challenges facing each team. It is unclear if this is held before or after the second workshop. The last element was an additional retreat that was held at least 2 years after the first workshop and included more than 37 people including members from teams that did no longer existed. This retreat included a keynote speech and discussions of challenges facing the teams (p.496-501).

Several measures were used for this study. These were answered before the intervention by all 8 teams but only 3 teams answered afterwards. It is unclear at what point in time exactly these were answered the second time. The instruments were Attitudes Toward Health Care Teams Scale (Team in relation to profession), Anomie Scale (goal clarity, role clarity, conflict), Quality of Communications Scale, Team Effectiveness Scale, Cohesion Scale and Team Skills Scale (p.501-502). The results show no significant changes on the different measures (attitude, anomie, communication, effectiveness, cohesion, skills) though small increases was evident (p.502-506).

Dunn and Holt (2003) conduct a non-experimental study on the effects of a longitudinal team building intervention. The purpose was to examine the effects of the intervention and to understand the characteristics of the consultant who delivered the intervention. The participants are 27 players at a college ice hockey team in Canada (p.351-353).

This intervention focused on goal setting, interpersonal relations, problem solving, role clarification, development of responsibility and accountability. The intervention consisted of weekly team meetings and weekly individual meetings with the coach, the senior captain and five additional captains. The coach only attended the first team meeting. In addition to this the consultant attended all home games and some away games. Each meeting was flexible and adjustable to the team needs. It is unclear how many meetings were held during the season. In the beginning of the season the meetings centered on goal-setting. In one such exercise the consultant asked players to prepare an imaginary newspaper article that they wish was written about them in the end of the season. This was used to develop each players goal for the season which they presented for the rest of the team. At this presentation the coach staff started and following them the captains presented. This was done to develop the roles of leadership in the team. Through the season the team returned to these goals to keep

them in mind. The reason for having every player present in front of the team was done in order to emphasize that each individual was expected to contribute on and off the ice. Additionally, it gave players insight to their teammates' perspectives. Other interventions that are described in detail are movie watching and "the press conference". Watching movies or clips from movies was used to highlight performance related factors and having players discuss these afterwards. Again, every player was asked for what lessons he took away from the movie. The press conference exercise was developed from one of these movies by the players themselves. In this exercise each player was interviewed by other players and was expected to be accountable for his answers. The intention was that this exercise would help the team resolve issues in the team. The last intervention that are described in detail are debriefings of games. These focused on the emotional and mental aspects of the game and issues. Identified issues was used to develop goals for the upcoming game. In these sessions the consultant would sometimes ask the players that did not play to assess the game. The was used to develop accountability and give everyone the chance to voice their opinion. The consultant also interacted with the players in informal settings to build trust. An overview of interventions with the team also show exercises focusing on building team traditions, development of coping skills among other things (p.354-355).

The study used individual semi-structured interviews of all players. These were conducted two weeks after and it took two weeks to interview all players. Each interview took 30 to 60 minutes. These data were analyzed through inductive qualitative data analysis. Additionally, the authors employed a member-check 38 months after the interviews where they invited 5 players to review the results (p.357-358). The authors conclude that the program was generally perceived positively but also as time demanding. The absence of the coaching staff was also perceived positively because it gave way to more open communication. Additionally, the consultant is positively evaluated and seen as a part of the team who respect everyone. Furthermore, the players approve his style of communication. (p.359-363).

Dunn and Holt (2004) conduct a non-experimental study on the effects of a team building intervention that uses principles of personal disclosure and mutual sharing. This intervention follows the same team as Dunn and Holt (2003) but took place in the

end of the season at the national championship tournament where the team had to play three games in four days (p.362-367).

The intervention started with a team meeting one week prior to the championship. Here the players were instructed to bring a personal story with them to the championship that would make the other players want to go to battle with them. The story should emphasize the players motives, character and desires. The battle reference was related to a second World War movie the team had seen earlier. As described above the players were used to this kind of assignment. The night before the first game the players revealed their stories. The message that was given to them included the following excerpt: "Convince us that we would want you in the trenches alongside us when we go to war tomorrow." (p.367). And: "What you will get out of this meeting will depend entirely upon what you are willing to put into it" (p.367). Hence, the team was asked to disclose their personality in order to bring the team together for the championship. Thereafter the consultant started with two personal stories and then the players. The storytelling took 2 hours for the first half of the team and therefore the rest were postponed to the next evening. The second meeting took 80 minutes (p.367-368).

The data for this study was part of the interview from Dunn and Holt (2003). The conclusions from this study are divided in two themes. One is the perception of the meetings and the other is the perceived benefits of the intervention. The former theme revolves around apprehension before the meeting and the importance of the first speaker because he set the emotional tone for the rest of the team. Additionally, the meeting was experienced as emotionally intense and an unforgettable life-experience. The latter theme has three subthemes. First, an increased understanding of oneself and the other teammates. Second, cohesion increased by developing closeness and meaningfulness which made players put in an extra effort during games. Third, the meetings developed confidence and trust between the players. For some players this even turned into a belief of invincibility (p.371-375).

Eden (1985) conducted a quasi-experimental study of 18 logistics units in the Israeli military. The purpose of the study was to investigate if team building improves team and organizational functioning. The units' range in size from 100 to 250 persons. They are all part of the same wider structure which consist of 6 departments that consisted of 6 to 16 units each. The 18 units were picked randomly by pairing units in each

department and thereafter randomly picking 9 pairs and randomly allocating one of each pair to the control condition or the experiment. In total these 18 units included about 3500 persons. The authors describe the units as logistic teams that supply the military with material. However, some of the units are described as having "…quite a civilian, industrial flavor…" (p.95) because some units employ 80 percent civilians and a minimum of 20 percent civilians were employed in each unit (p.94-96).

The intervention was a 3-day workshop which was conducted by psychologists from the military and followed five stages: a) Diagnosis and contracting with the team leader one week before the intervention in 2 to 3 hours. b) The workshop started with discussion of expectations and contracting with the team. c) Team diagnosis. d) Various team building activities. The author mentions the following: "…conflict resolution, problem solving, airing and relieving interpersonal friction, role negotiation, and role definition" (p.96). e) The workshop finished with activities that were intended to "move" the team building activities outside the workshop. These included: "…writing of new role descriptions and interpersonal contracts, planning implementation, and assigning responsibility for monitoring implementation" (p.96). In total the workshop lasted for 25 hours. Some of these stages are described very implicitly. For example, c, but it also follows that these stages and activities probably are carried out in a dynamic fashion, which resembles that each team is diagnosed two times and that both the team leader and the team as a whole go through a contracting phase. It is unclear what the control condition included. It is not revealed to the teams that they participate in an experiment (p.95-96).

The team intervention was measured through three questionnaires that that were randomly giving to about 50 people in each unit with proportional representation of gender and civilians. In total 747 people finished all questionnaires. The two questionnaires were giving prior to the workshop and 3 months afterwards. The first of these was the Team Survey Questionnaire where team-members describe their team on four dimensions. These are leader evaluation (Honesty, encouraging, backing up the team, facilitating goal achievement), team functioning (cohesiveness, teamwork, openness to new ideas, motivation), team efficiency (problem solving, organizing, decision making, performance) and team member rating (efficiency, motivation, morale). The second of these questionnaires was the Survey of Organizations which consists of six dimensions. These are general management (organization, planning, goal clarity, consideration, task climate), leadership,

coordination (conflicts, coordination), communication, peer relations and satisfaction (with: peers, leader, work). These are used to measure relation to the wider organization. The last questionnaire was the Workshop Evaluation Questionnaire which are used to tab into the participants subjective evaluation of the effectiveness of the workshop afterwards (p.95-97).

The overall conclusion from these results is that it is safest to say that the intervention had no impact. The Team Survey and Organization Survey showed no significant change. If we look at responses to the Workshop Evaluation Questionnaire 39 percent indicate that the workshop had a great or medium positive effect on the personal level or on the team. These respondents mention several factors that improved (e.g. efficiency, decision making, communication etc.) but it is unclear how many backed this and it was not backed by results from the two other surveys. The author also questions the validity of these factors because it is not backed by the two surveys. Additionally, 76 percent would recommend it for other teams and 48 percent indicated that it dealt with important team problems (p.96-98).

Eden (1986) made a replication of the above study. This study is therefore very similar and only the differences will be described here. Again, the context is the Israeli military but this time it is command teams that participate. 7 teams took part in the intervention and 9 teams took part in the control condition (Once again, no description of the control condition exist). In total 220 individuals participated in the 7 teams and 280 participated in the 9 teams. Each team comprised two to four officers, four to seven crew commanders and one master sergeant. Teams were randomly allocated but during the experiment some teams were deployed to military duty due to a military conflict and therefore had to be replaced. The study used the same intervention as the previous study but used a different measure. The teams were instead measured by the Military Company Environment Inventory which was already used by the military. This consisted of 7 dimensions: involvement (pride, voluntarism, invested energy, interesting conversations, varied activities and friendliness), peer cohesion (freely discussion of personal problems, togetherness during leisure time, caring for each other), officer support (encouraging, help new soldiers, spend time with soldier during spare time, responded to soldiers suggestions, etc.), personal status (influence, individual thinking, etc.), order and organization, clarity (clear expectations from leaders, clear mission, required performance level) and officer control (punishment,

the use of reprimand, etc.). Additionally, four other measures were included: Teamwork, conflict handling, challenge (team set hard goals, team provided a challenge, team emphasized improving performance) and combat readiness (p.133-139).

The results indicate no significant change for ten factors (involvement, cohesion, leader support, personal status, order and organization, clarity, leader control, challenge, information about performance, combat readiness) when comparing the intervention teams with the control teams, but three factors (teamwork, conflict handling, information about plans) shows a significantly higher improvement for the intervention teams (p.139-146).

Goldberg (2000) conduct a case study on how he conducted a team intervention of a senior executive team in a multi-million dollar bank. The participants are a group of executives (a long-term team) that needs help because they had problems continuing the current growth rates of the bank that previously had been very successful. This decline in growth had challenged the team to a degree that made them pull away from each other instead of working together even though the lack of growth called for more collaboration between departments than ever. Goldberg describes the case in rich details. For example, how he gets overwhelmed by the power projection of the office when he first meets the CEO (leader of the team) or how he experiences difficulty feeling empathy for the team due to their wealth (members are described as being rich enough to stop working) and power. The details are too rich to depict here but I will try to unravel some of the tools or behaviors that Goldberg uses to develop the team (p.225).

The process starts with a phone call from a lawyer that described the situation and requested help. Next, a meeting was facilitated with the lawyer and CEO. Here the situation and history of the company is described. Along this description Goldberg tells how he feels about the other persons. For example, how it is difficult to get a word in when the CEO talked and how he reminded him of Pharaoh complaining about the 12 plagues. In this meeting Goldberg uses a test question in the end, that is: "To what extent are you part of the problem, and are you interested in finding out what others think?" (p.227). It is described how he looks for small signs in the behavior of the other person. The CEO becomes more silent and claim that this is needed, or the firm is finish. In this moment Goldberg believes the intervention will work. From here

it was agreed that Goldberg would meet the team and have a talk with each individual for one hour. The information from all this would be reported back to the team transparent to everyone. This is done to make all members feel as a client and not just the CEO. These data would be used to develop a tailored intervention. At the meeting with the group Goldberg was introduced and gave his take on the initial conversation with the lawyer and CEO. Hereafter all members were asked to give their thoughts about the intervention. Here no one was allowed to remain silent. The interviews followed the next two days. The author brings along a number of pre-made questions for the interview (p.225-230).

The design of the intervention was presented to the CEO and one week later to the team. This focused on developing the patterns of communication. For example, through the tool 'left-hand column' which helps people identify thoughts they don't reveal in order to help them figuring out what holds them back from speaking the truth. During the following conversations members referred to the left-hand column if they had something difficult and unpleasant to say. When they did so they got a rubber giraffe and passed it on to the next that refers to the left-hand column. Another tool was for Goldberg to encourage the quieter members to speak, to decrease the power of the CEO and to stop conversations if one person is no longer listening to the others point of view. These tools would enable them to start resolving problems where Goldberg would be present to help them. The meeting started of with every member disclosing a personal problem at work and home. This was done to help the team get to know each other. Thereafter, all members received feedback on the interview. Here Goldberg convey the information that from his experience people must not feel criticized. Otherwise they will spend time defending themselves instead of acknowledging the problems. However, he also claims not to hide away the truth about the situation. So, it seems to be a delicate act of balance. In this report problems are stated if more than one person sees it as a problem and they are ordered in descending order of frequency. This process was done through an evening and the next morning the discussion started with a sort of role clarification. The topic was the balance between having responsibility for one business unit and for the firm as a whole. This led to a discussion on why it was difficult to take responsibility of the whole firm which further led to a strategic and structural discussion (p.225-231).

After this the group got feedback on an assessment instrument, they had answered (FIRO-B). This describes a person's need for inclusion, affection and

control. These individual profiles were shown together as a group and gave the team some understanding for the personal reasons for some of the conflicts. Then members were paired and asked to give feedback on the others role in the organization and come with recommendations on how it could be improved. Thereafter each person describes their role in terms of purpose, function, and how they like to be perceived on a flipchart. The whole team gives feedback to this. This exercise gave another opportunity to train left-hand column communication and to learn to get critical feedback. When it was over everyone was asked to write down feedback that was not already given and post it on each other's flipchart. The last element was a structured conversation on a relational problem that needed to be resolved. Due to time constrain only one such problem was addressed but all members had one-on-one meetings the following month to address pressing issues. Each member prepared for this by writing down the issue and what they need from the other person. The structure follows turn taking and is ended with each person make a commitment to the other person. The meeting ended with each member reviewing the day and making a commitment to the team that they believed would make it more effective (p.225-233).

No direct measures were used for this study instead Goldberg refers to a follow-up phone-call with the CEO who describes how everything is going after the workshop seen from his point of view. Few conclusions can be drawn from this. For example, the team meeting had become more effective and the atmosphere seemed lighter. Additionally, people started to realize that many problems were organizational rather than personal (p.233). Overall no conclusion is given by the author and it would have been beneficial if this case study had referred more to how the participants experienced the intervention.

Gordon and Elmore Jr. (1984) conduct a non-experimental study on a team building intervention. This study is a one-page description of a team building workshop for a swim team at Illinois State University. The team has 31 members and consist of two teams of different gender that had recently been merged. The intervention starts with an initial meeting with the coach that describes the situation. Based on this the psychologist developed two workshops of two hours. The first workshop began with the participants being divided into five mixed-gender teams. These were asked to make a list of experiences they had had at the swim team that satisfied and dissatisfied them. Each group rated the importance of these and shared their rankings with the other

groups. The process identified 7 satisfactions and 9 dissatisfactions. The second workshop was held two weeks later with the same groups. Each group was asked to make a list of ways that would ensure the continuation of the 7 satisfactions. Additionally, they were asked to brainstorm on how to make the 9 dissatisfactions more positive experiences. The study did not use any measures but the authors report that the workshop was met with positivity and reduced conflicts were reported. Additionally, it's reported that unified cheer was developed, and a team member became responsible for psyching up the team (p.278-279). Overall this study has a very low methodological quality and it is difficult to draw any substantial conclusions and generalizations from this study. However, it gives an example of how team building can be conducted.

Lu et al (2010) conducted a non-experimental study on team building workshop that builds on the theory of cooperation and competition. The participants were 13 teams ranging from 2 to 31 persons and in total 146 people (I.e. all employees but only 95 participated in the workshop) in a high-technology firm in China (p.101-110).

The idea behind this intervention builds on former research which indicate that cooperative goals (instead of competitive or independent goals) develops interaction dynamics that lead to effectiveness. The idea is that cooperative goals create constructive controversy that in turns gives confidence, creativity and productivity. With cooperative goals the individual believe that their achievement can only be successful if other team members also reach their goals. According to the authors former research indicate that this type of goal makes members more willing to engage in information sharing and discussions of differences referred to as constructive controversy. The intervention lasted for approximately 1.5 day (Friday evening and Saturday). As noted earlier 95 people participated and the rest were asked to consult their group for information about the workshop. It is unclear specifically what elements were part of the workshop apart from the overall theme on cooperative goals. After the workshop each team got a workbook with discussion topics and activities, they could work on the next two months. The average sessions for each team was 26. Again, it is unclear what the exact content was (p.108-109).

They answered a questionnaire before the intervention. 59 people completed this questionnaire. Two months after the workshop intervention the questionnaire was answered again. This time 73 people completed it. In the end 42

people had completed both questionnaires. The questionnaire included five measures: Goal interdependence, group potency (i.e. confidence), group creativity, group productivity (p.111-113).

The results lend support to the notion that when members believed their goals were cooperative it fostered constructive controversy which resembles the willingness to discuss diverse opinions openly. This result was valid within teams but also between teams. On the other hand, teams that believed they had competitive or independent goals had a negative relationship with constructive controversy. When constructive controversy was fostered it made teams feel more potent, creative and productive than teams with low constructive controversy (p.115-127).

Mazany et al (1995) conducted a non-experimental study on the effectiveness of a hybrid workshop that focused on strategy development and team building in a manufacturing organization. The idea behind this combination is to make it more relevant for the organization and to build commitment and creativeness in the participants. The hybrid idea builds on the Veritas Accelerated Learning Unit (VALU) that tries to connect the team building efforts to the wider organization by incorporating the overall strategy. The participants were a senior management team from a manufacturing company in New Zealand. The organization employs around 200 people and has annual sales of $35 million. The team consist of 8 senior managers with functional responsibilities (p.43-47).

The intervention consists of a three-day workshop and had the following objectives: a) developing a strategic plan, b) developing an ongoing strategic planning process, c) develop improved teamwork and understanding, and d) provide an environment where it is possible to enjoy the achievements of these objectives. The latter two objectives are clearly team building, but a and b can also be seen as a part of team building if these are understood as a form of goal-setting and thereby a part of a task-oriented practice. The workshop consisted of three fixed slots each day (8am-12am, 1pm-6pm, 7:30pm-), but the last day only consisted of two slots. All in all, that gave 8 sessions with the following themes and order: strategy session, warm-up exercises and strategy, specific analysis and skit preparation, specific analysis, outdoor exercise and presentations, skit and major team exercise, major team exercise and debrief, team theory and next steps. From this it also emerges that the workshop consisted of both indoor and outdoor activities (p.44-46).

This intervention used pre and post case studies and questionnaires to test effectiveness of the workshop. The administration of the questionnaires followed a process where the team was given a case study in the morning the first day and two weeks later. They had one hour to work on the case study and immediately thereafter they answered a questionnaire individually that has the following dimensions: Approach to decision-making (e.g. leader appointment, individual decisions or consensus), participation (e.g. equal involvement or alienation), efficiency and group experience. These dimensions indicate how well the group function (i.e. relationship-oriented practices). Additionally, the performance was evaluated by the quality of solutions to the case studies. The authors note that this might change due to the fact that the participants become better at the type of assignment the second time. In effect the retest effect might influence the result (p.45-47).

The results showed no improvement on the content part but showed significant improvement on all process dimensions (decision-making, participation, group experience, group efficiency). However, the latter dimension only had an alpha level of 0.10. In terms of decision-making it became more defined, consensus-oriented and hence was not dominated by individuals. Participation improved in terms of being active and having participation more equally spread. Additionally, members were more prepared to give and receive ideas from others. The group experience was found to be more enjoyable and the group used time more efficiently. Additionally, members were happier with the output and more committed to it (p.47-48).

McClernon and Swanson (1995) conducted a quasi-experimental study on the effects of team building with computer support or without. The purpose therefore was to investigate how the use of a group decision support system (GDSS) affect teams during a team building intervention. In other words, to investigate if computer support changes the effects of team building. The participants were existing groups in a nonprofit organization that varied from 5 to 12 members. In total 186 people participated and 24 groups. Allocating 8 to each treatment (p.39-47).

The study has two interventions and one control condition. The intervention groups undergo a three-hour team building either assisted by computer support or not. The control condition consisted of a team meeting that they usually had. The computer supported intervention used a software called DISCOURSE. Each participant has a device that enable them to answer anonymously to questions and the

facilitator can display these answers in various ways. This is used to support the team building intervention which is equal in the two intervention groups. The team building intervention has five phases: a) Introduction to team building and rating of group collaboration. b) data collection, analysis, feedback and discussion. c) Brainstorming on group strengths. d) Brainstorming on areas that could improve team functioning. e) Creating an action for increasing team performance (p.45-47).

The teams were measured at three points in time. Before the intervention or meeting they answered questionnaires on background information (Used to randomize groups by taking account of individual differences) and group cohesion. After the intervention or meeting they answered questionnaires on group cohesion, performance. The same questionnaires were given at the next scheduled team meeting (p.47-49).

The immediately results after the intervention showed that both interventions are higher on all measures compared with the control group. The two interventions do not differ much, but on two measures. The intervention with computer support reduced the informal leadership resulting in less dominance by one or two people. The intervention without support showed higher quality for group processes. Thus, the authors conclude that the use of computer support did not create major advantages or disadvantages for the groups. The long-term results of this study seem less encouraging with minimal differences between the intervention groups and the control groups. Hence, it is concluded that the interventions are not effective over time (p.49-56).

Mitchell (1986) conducted a quasi-experimental study on teambuilding through disclosure of internal frames of reference. The purpose of this study was to test if the theoretical idea of disclosing internal frames of references would increase teamwork more than either control condition (i.e. no intervention) or a conventional intervention. The participants were 17 intact work teams that ranged from four to five people. 13 of these were students on an MBA program, and the last four teams consisted of managers from different business organizations. The student teams were part of the study because they all participated in the same type of project work where they had to help a business organization solve a real problem of theirs. The business teams were included because it served as real cases and conclusions from the student teams could

be compared with these in order to see if there is a basis for generalize the results to real world teams (p.15-18).

The idea behind the intervention is that each individual tries to balance internal forces (e.g. self-interests, values, personal meaning, etc.) and external forces (e.g. organizational requirements) that creates an alignment or internal frame of reference. This is understood as a lens or way of interpreting events in the organization. This idea forms an intervention that intend to facilitate an exchange of information between group members that will increase the understanding of each other. The proceedings of the experiment started with initial contact to the team where the purpose was explained. Thereafter each team was randomly assigned to one of three conditions. These were: the alignment intervention, a conventional team building intervention or the control condition which had no intervention. Thus, the control teams only provided information through the measures but did not undergo any intervention. Due to the small number of business teams these were only assigned to the alignment intervention and control condition. For the interventions the use of a protocol was used in order to make the interventions as identical as possible (p.18-22).

The alignment intervention consisted of one session that lasted 2.5 hour and comprised the following phases: a) The first phase consisted of an introduction to the theoretical background for the study and how it intends to develop better teamwork. b) Thereafter each participant got 20 minutes to answer a questionnaire with three categories (Personal or life symbols, career, current work or organizational) and 12 questions in total. These reflects questions related to the participants internal frame of reference. c) Next, each person got 20-25 minutes to talk about their responses and discuss these with the team. d) In the last phase the whole team discussed and processed the information. The conventional team building intervention consisted of data gathering in advance, analysis and feedback to the team. The data obtained consisted of the questionnaire that all teams had to answer in advance (see next paragraph). This intervention also consisted of one session of 2.5 hour and it also had four phases: a) Introduction to working relationships and the questionnaire. b) Each member got the answers other teammates had answered about the individual and got 20 minutes to think about these. c) Each member then got 20-25 minutes to share thoughts about the answers. d) The team as a whole discussed and processed the information. These two interventions are very similar but differ in the content. The alignment intervention focusses on discussing how each individual's alignment

influence is and how it affects relations, while the conventional intervention focusses on discussing the relationships (p.18-22).

In this study the Barrett-Lennard Relationship Inventory (OS-64) was used to measure interpersonal relationships on four dimensions: level of regard, unconditionality of regard, empathy and congruence. Additionally, members of each team were assigned another member that they had to answer questions about from the inventory. On top of that several other questionnaires were part of the study but unfortunately these were not disclosed. Participants in the interventions answered the questionnaire prior to the intervention, immediately after the intervention and two months after the intervention. The participants in the control condition answered the questionnaire prior to and two months after the interventions (p.18-22).

The results from this study lend support for the alignment intervention and the author calls it "…substantial improvements…" (p.26). If we look at the results from the relationship inventory both the alignment and the conventional interventions showed improvements but only the former was significant. Looking at the results from the questionnaire it is indicated that the alignment intervention has the biggest improvements on compatibility of the work team, satisfaction with the team experience, levels of efficiency and relationship quality. Additionally, both the conventional and alignment interventions indicated increased understanding of other team members and themselves (p.22-26).

Murrell and Valsan (1985) conducted a case study on team building intervention in an agricultural development project in Egypt. The purpose was twofold. First, it intended to introduce an alternative to other forms of training and secondly, it intended to increase the functioning of the team. The development project was a sponsored project by the Egypt and American governments and intended to develop management in the agricultural sector. Hence, it was referred to as the Agricultural Sector Management Development Project. It had run for three years when the authors made the intervention. The team consisted of 8 members (p.11-12).

The authors describe the intervention as a basic team building intervention where they focused on the needs of the team. Initially the authors conducted a data gathering through three methods. First, they had interviews with each team member in order to figure out what the team needed in relation to working relationships and the task at hand. Additionally, these interviews were used to explain

the intention of the workshop to the participants. Secondly, they observed the team and third, they made several informal interviews including people outside the group. From this data gathering five themes emerged that also constituted the phases of the workshop: a) Goal clarification where each member worked on identifying goals independently and then discussing these with the group; b) job descriptions where each member described his or her responsibilities and then a group discussion was facilitated; c) inter-group relationships (decision making, conflicts, morale, meetings, addition of new members, outside social relationships) where a discussion was facilitated taking the information from the data gathering into account; d) conditions of work where a discussion was facilitated; e) Future success of the project where a discussion was facilitated starting with defining what success meant for the team. The sequence of these was intended to have a good start and a good ending, while the three middle themes were more problematic for the team. This was intended to facilitate a good and open communication during the workshop. It is highlighted that open communication must be welcomed by the leader which it was in this case (p.12-14).

In this study the authors use no measures of its effect but discusses what the effects were as experienced by the authors. These results were also debriefed to the team after the workshop. The authors conclude that the team developed its abilities in relation to the five themes that were part of the workshop, but continuous work is needed in order to deepen the development within all areas (p.14-16).

Pain and Harwood (2009) conduct a quasi-experimental longitudinal case study of a mutual sharing team building intervention. The participants are 18 players from an English university soccer team. Due to injuries and rotations, not all players participate in the study for the full period. Additionally, the coach took part in every team building session (p.523-527).

The intervention consists of a weekly administration of a self-developed instrument called Performance Environment Survey (PES), which is used to assess team functioning. This was done for five weeks in a row before the intervention. Thereafter four team meetings of 45 minutes each were held over four weeks. These meetings consisted of a discussion of team functioning in which the PES data was used to facilitate it. The meetings followed three steps. First, the players were seated in a half-circle and the psychologist feed the data back to the group starting with the most positive and ending with the most negative. Secondly, an open discussion was

facilitated. Thirdly, development of realistic actions to develop team functioning further (p.527-531).

The measures used for this study includes a focus group interview after the season, objective performance measures and the PES which also contained subjective measures of performance (p.530-531). The performance measures indicate improvement. For objective measures the team won 5 games after the intervention whereas they lost 2, drew 2 and won 1 before the intervention. It must be noted that this measure is difficult to interpret since there exist no account of the opponents and the situation in general. However, the subjective measures of performance lend support to an increase in performance (p.530-533). The measures of team functioning indicate improvements on trust, communication and cohesion (p.530). No inferential statistics is derived from the results. The group interview revealed themes regarding processes and outcomes. For the former, the workshop facilitated open discussion that gave room for the more silent players and fostered trust. Additionally, it developed new insights. For outcomes it was found that it increased ownership of team functioning, improved quality during training, improved self-understanding and self-awareness (p.534-535).

Pollack and Matous (2019) made a non-experimental study on team buildings effect on patterns of communication. Thus, the purpose was to understand how team building influence communication in a project team. The participants were a single project team of 21 people (one participant resigned shortly after the intervention started) in an Australian organization that worked with event project management. The team was in the process of merging two former teams into one. These two teams had previously had different assignments. One of the teams usually worked with big annual events that had a planning period of 1.5 year. These events attract significant media attention in Australia. The other team usually worked on smaller events with shorter planning periods (p.473-477).

The idea behind the intervention is that positive relations can be built through a process of personal self-disclosure. The purpose of this is the theorizing that this will help the team build trust and knowledge sharing. The intervention had four phases: a) Social network analysis. This approach is used to understand individual communication and communication interactions in the team. Through structured interviews each member was asked to rate their interaction with each of the other members on four different questions. One question was asked and then the participant

rated all members on that question before moving on to the next question. The use of structured interviews was done in order to address concerns and questions from the participants. One participant decided not to participate in this interview. b) Selecting intervention pairs. From these answers a social network analysis was made and used to form interventions pairs. Additionally, participants were asked if they preferred to be paired with anyone and whether they preferred not to be paired with any specific. Negative preferences were taken into account but not all positive preferences could be taken into account. Finally, the team leader reviewed the pairs to take any interpersonal considerations into account. Pairs were picked with the intention to form pairs that would benefit the most from relationship building and those pairs which relationship improvement would benefit the team most. c) Relationship building which promotes personal understanding through a structured conversation that last for at least 45 minutes. d) Follow-up. Three months after the intervention the social network analysis was repeated in order to evaluate if it had provoked any change. These data were triangulated with interviews, observations and feedback from participants (p.474-478).

The measures for this study were the data provided in step a and d. The results show significant increase in how comfortable members were with personal communication and a significant increase in how frequently members discussed personal matters and work-related issues (p.478-482).

Shipherd et al (2014) conduct a non-experimental study on team building with a college rugby team in USA. The purpose was to see if a short team building intervention would affect cohesion of the team. The participants were a team of 19 rugby players and one coach. The team was a mixture of old and new players. The team had two players that were identified as leaders and one coach who was new to the team but not to the role as coach (p.34).

The intervention started with a meeting with the coach and thereafter a 16 weeks data collection phase started. In this phase the consultant observed the team at 8 times during training and in 2 games. Additionally, he interviewed 6 players and the coach. In the end of the period all players completed the Group Environment Questionnaire (GEQ) that measures cohesion (p.35). For the second phase the consultant together with the coach decided to do a workshop activity called Team Building Race, where the team goes through a challenging activity outside their normal environment and face challenges to their teamwork that they will also experience in

their normal environment. For this activity the team was divided in four groups and had to complete six stations (e.g. obstacle course). Every station ended with a discussion on lessons learned and how these could be used for the whole team. One week after this intervention the players answered the GEQ and again 10 weeks after. Additionally, the consultant observed the team in 9 training sessions and 3 matches and interviewed 8 players and one coach (p.38-41).

The results indicate a significant increase in cohesion both one week after and ten weeks after the intervention. The qualitative data suggested improvement in several areas. First, the team developed more effective communication especially under pressure. Second, players learned strategies to recover from personal and team mistakes (e.g. breathing exercises or increased understanding of teammates). Third, increased role understanding. Fourth, development of clear team goals. Additionally, the players indicated that the intervention activities had been fun (p.41-44).

Text	Diagnosis	Goal-setting	Role clarification	Interpersonal-relations	Problem solving	Participants	Context	Datatype	Performance outcomes	Attitudinal outcomes	Behavioral outcomes
Bayley (2007)		x	x	x	x	11 teams ranging from 5 to 19 people (In total 110 people)	Health care	Mixed-method		x	
Birx et al (2011)				x		1 team of 29 people	Education	Mixed-method		x	
Bottom & Baloff (1994)			x	x	x	24 teams of 6 people. In total 144 people.	Students (Business)	Quantitative	x	x	
Bushe & Coetzer (1995)						24 teams. In total 96 people	Students (Business)	Quantitative	x	x	
Clark et al 2002			x	x	x	3 teams of 4 to 25 people	Health care (Geriatric)	Quantitative		x	
Dunn & Holt (2003)		x	x	x	x	1 team of 27 people	Sport (College, ice hockey)	Qualitative			
Dunn & Holt (2004)				x		1 team of 27 people	Sport (College, ice hockey)	Qualitative		x	
Eden (1985)	x	x	x	x		18 teams of between 100-250 people. In total 3500 people	Military (Logistic)	Quantitative	x	x	
Eden (1986)	x	x	x	x		16 teams of between 7-12 people. In total 500 people	Military (Command)	Quantitative	x	x	x

Goldberg (2000)			x	x	x	1 team (Number of people unclear)	Business (Banking, senior executives)	Qualitative			
Gordon & Elmore Jr. (1984)	x			x		1 team of 31 poeple	Sport (College, swim)	Qualitative			
Lu et al (2010)		x				13 teams of 2 to 31 people. In total 146 people (95 participated in workshop)	Business (Technology firm, China)	Quantitative	x	x	
Mazany et al (1995)		x		x		1 team of 8 people	Business (senior executives)	Quantitative	x	x	
McClernon and Swanson (1995)		x	x	x	x	24 teams of 5 to 12 people in total 186 people	Business (Nonprofit)	Quantitative		x	
Mitchell (1986)				x		17 teams of 4-5 people	Business & students	Quantitative	x	x	
Murrell and Valsan (1985)	x				x	1 team of 8 people	Business (Development project, Egypt)	Qualitative		x	
Pain & Harwood (2009)				x		1 team of 18 players and 1 coach	Students (Sport, scoccer)	Mixed-method	x	x	
Pollack and Matous (2019)				x		1 team of 20 people	Business (Event projects)	Mixed-method		x	
Shipherd et al (2014)	x			x		1 team of 19 players and 1 coach	Sport (College rugby)	Mixed-method		x	

Figure 2: Summary of included studies

3.2 – Synthesis: Themes of Included Studies

In this section I will synthesize the themes that emerged from the included studies. Overall four themes surfaced and will be dealt with in order. These are perception of the intervention, the design of the intervention, outcomes and long-term outcomes.

3.2.1 – Perception of Intervention

This theme centers on how participants view the intervention. Only six studies investigated this theme and in general it is difficult to generalize from these six studies to all types of team building interventions because the variety of interventions span various team building setups. However, all six studies get positive feedback. For example, Shiphard et al (2014) report that the intervention was experienced as fun despite participants expecting it to be boring (p.43-44). Bushe and Coetzer (1995) report that both the traditional intervention and the appreciative inquiry intervention was experienced as powerful and helpful (p.25). Dunn and Holt (2003) found that the consultant was viewed positively and especially his style of communication. The absence of the coaching staff was also viewed positively because it gave room for more open communication among the players. However, despite the intervention being viewed as generally good it was also noted that it was very time demanding. The intervention from Dunn and Holt (2003) was also one of the longest being a season long intervention and for some players the team meetings interfered with the preparation for games because it took so much time (p.359-363). Hence, in general it must be considered how much extra demands it puts on the participants of the intervention. If we turn to Dunn and Holt (2004) the intervention was viewed with apprehension and also turned out emotionally intense, but players perceived it as an unforgettable life experience. Thus, even though players were nervous about it the intervention ended up being perceived very positive (p.371-375). The intervention by Pain and Harwood (2009) ended up facilitating an open discussion that also gave room to the more silent players and developed new insights (p.534-535). The last paper to investigate perceptions of the intervention is Eden (1985) who found that 39 percent experienced a positive change personally and, on the team, due to the intervention. Additionally, 48 percent felt that the intervention dealt with important problems. These numbers might be interpreted as being a bit low. For instance, it indicates that 52

percent of participants believe it did not deal with important problems. The author calls it a ‘smashing success’ though and 76 percent actually recommends the workshop for other teams (p.96-98). Hence, the workshop is generally not perceived as bad but there is an indication of problems going under the radar.

The learning points from these papers are that in general various forms of team building interventions are perceived as being positive for the team and individual. It can be used to facilitate more open communication and give room for the more silent participants. Additionally, it has the potential to be experienced as powerful. However, attention must be drawn to the demands it puts on the participants and attention must also be drawn to team problems that are unspoken.

3.2.2 – Intervention Designs

This theme focuses on how each team building intervention has been designed. The majority of these interventions are some kind of workshop. However, these vary a lot in scope and design. Other designs are activities and team meetings that are held continuously over a longer period. These various designs can be categorized in many different ways and none are more correct than the other. I have decided to divide these designs into which elements (goal-setting, role clarification, interpersonal-relations, problem solving) of team building they focus on. I will start with those that focus on all four and end with those that focus on one element.

Six studies focus on all four elements. The first of these is Murrell and Valsan (1985) that conduct a data gathering initially, or what I refer to as ‘diagnosis’. This is done to develop the intervention to the team’s needs. I will come back to the data gatherings later in order to go more in depth with these. For now, I will focus on how the intervention is build. The first element of this workshop focuses on the goals of the organization that the team worked with. The aim was to strengthen the existing goals by having the team discuss these. As mentioned earlier the intention was to have an ‘easy’ start and this seemed to succeed possibly because the participants were in highly agreement on this. The approach starts with each individual writing down the goals as perceived by her or him and then the team discusses these. The second element focused on roles and again started with each individual describing the role and responsibilities of their own job. The third element focuses on both interpersonal-

relations but also problem solving. The former element is targeted through a focus on group morale, how they bring in new members, outside social relationships between team members and resolving conflicts. The latter element centered on meetings and decision-making. The fourth part of the workshop focused on conditions of work where they focused on discussing two sensitive issues (staff size, incentives) but also less sensitive areas (personal development, personal rewards). The fifth element focused on the future success of the team's project. This was approached with two questions. First, what is success? Secondly, how to guarantee the future success of the project? (p.12-14). The authors do not discuss any future changes to their approach. To sum up this approach focused on identifying the needs of the team and ended up working on all four team building elements. These mainly consisted of team discussions of each element and the authors used individual writings to involve all participants.

The second study that focused on all elements is Bayley et al (2007). This intervention is designed as a two-day workshop focusing on goals, roles and working styles, communication and problem solving. The authors use a personality measure (Myers-Briggs Type Indicator) to help team members develop more understanding of themselves and other members. Hereafter the team looked at their roles assisted by Belbins team roles and work types. Next the team developed its own working norms (I.e. shared values). The second day the team worked on a task applying the lessons from day one. Here the team uses a root cause analysis to assess how they accomplish their tasks. The last element focuses on communication styles using insight from the root cause analysis and the Myer-Briggs Type Indicator and experiencing these in scenarios (p.189-190 & 200). Thus, this intervention uses a lot of tools and exercises to unfold the team building process.

The third study is Dunn and Holt (2003) who did a season long intervention with team meetings and individual meetings with the main players and the coach. These meetings are described as being flexible to the team needs. Some of the exercises that are described are the 'imaginary newspaper', movie watching, debriefings and the 'press conference' which I have described earlier. The consultant uses a variety of exercises to develop the team and it is described as being developed on the go with the team. For example, the 'press conference' was developed by the team (p.354-355). Hence, this intervention does not use a lot of tools as the former but utilizes a lot of different exercises.

The fourth and fifth studies are Eden (1985, 1986) who uses the same design in both studies. This is a three-day long workshop that starts with a diagnosis process with the leader prior to the workshop. The workshop starts off with contracting with the team and team diagnosis. Then the actual team building starts focusing on the four elements. However, it is not clearly described how these activities are done. The workshop ends with written contracts on these areas in order to facilitate implementation (p.96). This study design is unfortunately very implicit in its description of the team building processes which makes it difficult to draw lessons and examples of these.

The sixth study is McClernon and Swanson (1995) that use tools, lecturing, discussions, feedback and action plans as team building. First the teams are introduced to team building, then they answer inventories on group effectiveness and a collaborative work scale. These are fed back to the teams and discussed. Thereafter the teams discuss their strengths and how they can improve their team functioning. In the end they make an action plan in order to implement decisions from the workshop (p.45-47).

Three of these studies use a diagnosis first but Dunn and Holt (2003) indicate that they fit their intervention to the team along the way and Bayley et al (2007) set out to test a specific team building intervention without taking notice of the needs of the team. For McClernon and Swanson (1995) it seems like they collect data on the team, but this does not change the structure of the workshop. Next, all five team building designs show different examples of how a team building intervention can focus on all four elements. Either through a workshop with team discussions focusing on the needs of the team or a fixed design using specific tools and exercises or a season long process of meetings using different forms of exercises that take shape along the way.

Three studies focused on roles, relations and problem solving. The first is Clark et al (2002) who did four workshops over two years. The first workshop focuses on lecturing on the included themes and uses two assessment tools (Strength Deployment Inventory, Team Signature Technology) to assess and give the team insight on team dynamics and how team members react to conflicts. Additionally, teams got assignments focusing on the three elements. The second workshop followed up on these assignments and was tailored to the needs of the team but aimed to be a follow

up for the team. The third workshop brought together members from different team on a voluntary base. This was done to facilitate a discussion of the challenges that each team faced. The fourth workshop was similar to the latter but also included a keynote speech (p.496-501. This intervention makes use of tools, lecturing, an inspirational speech and discussions across teams.

The second study is Bottom and Baloff (1994) who used several different exercises as a three-day long workshop. The first day focus on people getting to know each other as they were new teams. This was done through a discussion of concerns and expectations but also with the use of a tool called FIRO-B that is used to assess how individuals relate to other people. Additionally, Johari's window is used but it is not clearly described how but it focuses on what is known to yourself and what is known to others. The second day focused on decision making and communication. Two elements are mentioned but not described – Desert survival and Murder one. A google search indicate that the first might be a team exercise based on survival in the desert. It is expected that the other is a similar game. The last day focused on resolving conflicts through three feedback exercises (Advertising firm, Role nominations, Ajax Appliance) (p.325-328). Hence, this intervention uses one tool and a number of different exercises to facilitate learning situations for the team.

The third study is Goldberg (2000) who describes an intervention with an executive team. Based on a diagnosis the author works on interpersonal relations, role clarification and problem solving. The first and latter part is worked on through the left-hand column technique and the author intervenes in the discussion to spread the discussion out between members and increase involvement. The interpersonal relations are worked with through personal disclosure of a work-related and personal problem. Additionally, they worked on resolving a conflict with the group (in respect to this the FIRO-B was used) but also through an assignment after the workshop where members would meet in pairs and resolve issues. Roles were also discussed and clarified in terms of purpose and function in relation to the wider organization (p.225-233). These three interventions are different apart from using one or two tools to assess the team, but all give insights and ideas to how team building can be conducted in order to work on roles, relations and problem solving.

One study focused on two elements. It is Mazany et al (1995) who focus on goals and relations. This is done through a workshop that focuses on strategy development and

teamwork. The workshop includes some exercises that are not further described apart from being a team, an outdoor and a warm up exercise. The team also gets some team theory which is interpreted as lecturing on team theory. Beyond this it mainly centered on strategy development which is seen as goal development since this is a senior executive team which main goal is their strategy plan (p.43-47). Since this study is mainly about goal-setting I will draw attention to one study that focuses on this exclusively. Lu et al (2010) studies the use of different goal types. The intervention has two overall elements. The first is a workshop where teams get knowledge on cooperative goals and learn how these can be reinforced. The second element is a workbook with activities and discussion topics the team could voluntarily work with the following two months (p.108-109). Unfortunately, these are unclear. But the overall idea is to give the teams knowledge on cooperative goals and its benefits and let them decide whether they will work with this type of goals. Hence, though these two studies focus mainly on goals they do so differently. While the former study focused more on developing strategy, where it seems like the input from the team is the leading part, the latter study focuses on informing the teams of a specific form of goals. Thus, these two studies are examples of discussion facilitation and directive goal-settings respectively.

The last group of studies all focus on interpersonal relations. One example is Pain and Harwood (2009) that uses an inventory which measures team functioning to facilitate discussions on this matter during four team meetings (p.527-531). Another example is Gordon and Elmore Jr. (1984) that facilitates a workshop where they focused on satisfying and dissatisfying experiences at the team and how the former could be extended, and the former made more positive. Additionally, they also help the team develop a unifying cheer and giving responsibility to one team member for psyching the team up. The latter element is an example of role clarification but since it is only one role and this role is specifically focusing on improving interpersonal relations it is more seen as this. In addition to this the authors also conduct a diagnosis beforehand (p.278-279).

Birx et al (2011) focused on developing the interpersonal relations through a day of challenging activities (p.174-176). Another study that also used challenging activities to promote the interpersonal relations is Shipherd et al (2014). In this study they conduct a diagnosis beforehand and then design an obstacle course

for the team which consist of five stations and ends with a debriefing of the learnings from the day (p.38-41).

Mitchell (1986) tries to develop interpersonal relations through sharing of internal frames of reference (e.g. values) to other members and through this developing understanding between team members. A similar intervention is Pollack and Matous (2019) that uses personal self-disclosure where personal understanding is developed between pairs. Another study that uses the idea of personal disclosure is Dunn and Holt (2004) who ask players to tell a personal story that reveal their personality to the rest of the team (p. 367-368). The above studies show three different overall approaches that develop the interpersonal relations in teams. One is a discussion of team functioning or experiences and another is the experience of going through challenging activities as a team. The last is personal disclosure in one way or another.

Apart from all the above groupings of team building designs Bushe and Coetzer's (1995) study is not categorized because their approach of appreciative inquiry gives the opportunity for the teams to utilizes the participants own experience of effectiveness. Hence, it is unclear which of the four elements they focus on, if any at all.

Before we move on let's have a look at how the studies conducted the diagnoses or data gatherings. Six studies describe the use of a diagnosis of the team problems before the intervention. Five of these met with the team leader beforehand and discussed the issues (Shipherd et al, 2014; Gordon & Elmore Jr., 1984; Goldberg, 2000; Eden, 1985; 1986). Three studies also made a team diagnosis where they discuss the issues with the team (Goldberg, 2000; Eden, 1985; 1986). Three studies made interviews with team members (Shipherd et al, 2014; Murrell & Valsan, 1985; Goldberg, 2000). Two studies made observations of the team (Shipherd et al, 2014; Murrell & Valsan, 1985). Additionally, Murrell and Valsan (1985) made informal interviews outside the team to diagnose problems. It is obvious that these studies made use of some common strategies to diagnose the team issues.

3.2.3 – Outcomes

This theme centers on the outcomes that each paper reports. One challenge is that these studies varies a lot in design as seen above and some of them are specifically fitted to the needs of the team. Additionally, the papers use very different measures. All together it makes it difficult to generalize links between interventions and outcomes. Instead this theme tries to identify if there exist some common trends or differences in outcomes. In order to best link these trends to the research question I will use the understanding of team effectiveness as outlined in the introduction. Hence, I divide the following into outcomes of performance, attitudinal or behavioral character.

The first category of outcomes is performance that is measured in objective terms or subjective terms. On objective measures two papers (Bottom & Baloff, 1994; Mazany et al, 1995) found no significant impact while two papers (Pain & Harwood, 2009; Bushe & Coetzer, 1995) found a significant impact. Few studies report objective measures of performance and it is clear that these are affected by many other things. For example, Pain and Harwood (2009) use the measure of results for a soccer team which are affected by many things other than the team building intervention. This of course makes it difficult to make any final conclusions but in the latter case the authors also measure the subjective evaluation of performance which supports the objective measure. Bottom and Baloff (1994) also report the subjective measure which indicates improvement and similarly participants report improvement on team effectiveness. Mitchell (1986) also reports improved group efficiency for their alignment intervention which can be seen as a measure of improved performance ability. In line with this Mazany et al (1995) also report significant improvements on group efficiency though this only has an alpha level of 0.10. Lu et al (2010) also report improvement on productivity, potency and creativity submitted by participants. One paper that report no improvement on a subjective performance measure is Eden (1986) who finds no significant change on combat readiness. Hence, all but one study reports positive changes on various measures of subjective performance and no studies report the opposite. However, the interpretation of this must be careful because this measure can be an expression for participants desire to see a positive change after the intervention.

The next category is attitudinal outcomes. The is by far the biggest group in the included studies and span various measures of attitude changes. I have grouped these into subthemes that indicate attitudinal outcomes. The *first subtheme is trust* which has had a positive change in four papers (Pain & Harwood, 2009; Dunn & Holt, 2004; Bottom & Baloff, 1994; Murrell & Valsan, 1985). None reports negative or no changes on trust. The *second subtheme is satisfaction* which four papers report positive changes on. Mazany et al (1995) report it as positive change on group experience while Birx et al (2011) report positive changes to both satisfaction with coworkers and job satisfaction. However, later tests show that these changes have vanished. Bottom and Baloff (1994) report positive change on satisfaction with team performance. Lastly, Mitchell (1986) reports increased satisfaction with the team experience for both intervention types but most for the alignment intervention. The *third subtheme is cohesion* which is reported in various ways in several papers. Five papers report a positive change on cohesion (Pain & Harwood, 2009; Dunn & Holt, 2004; Bushe & Coetzer, 1995; Birx et al, 2011; Shipherd et al, 2014) and Eden (1986) reports no significant change on cohesion but a positive change on teamwork. The latter is one of many other concepts that can be interpreted as an indication of cohesion. Other examples are Bottom and Baloff (1994) who report positive change on social support, Bayley et al (2007) report a positive short-term change on team functioning but no long term effect. Mitchell (1986) reports positive change on relationship quality for the alignment intervention and McClernon and Swanson (1995) report increased quality of group processes for the intervention without computer support. Hence, nine studies report various measures that indicate improvements to cohesion, while one study shows mixed results. The *fourth subtheme is communication* which eight papers report positive changes on (Bottom & Baloff, 1994; Pain & Harwood, 2009; Shipherd et al, 2014; Lu et al, 2010; Murrell & Valsan, 1985). Pollack and Matous (2019) report an increase in being comfortable with personal communication and an increased frequency of discussing personal and work-related matters. McClernon and Swanson (1995) report less dominance from one or two individuals in the computer supported intervention group which is an indication of improved communication due to more people being able to speak their mind. Lastly, Eden (1986) reports an improvement in information giving about plans to subordinates but no significant improvement in information giving about performance. In total ten papers indicate improvements in communication, and one shows mixed results. The *sixth subtheme is conflicts* and here

the results are more mixed than the other themes. Bushe and Coetzer (1995) report that appreciative inquiry showed no significant improvement on conflicts compared to the control group, but the appreciative inquiry improved on conflict management compared to the control group. Bottom and Baloff (1994) showed no significant impact on conflicts compared to the control group. Eden (1986) find a significant positive change in conflict handling. Murrell and Valsan (1985) report that the team improved in relation to conflicts, but mark that further work is needed. Thus, the results does not indicate that team building necessarily will help teams improve in relation to conflicts but some papers indicate that it is possible but this important area of team building must attract more attention going forward for practitioners and researchers in order to secure sufficient help is giving to teams that needs help with conflict management. The *seventh subtheme is decision-making* which three papers report positive changes on (Mazany et al, 1995; Bushe & Coetzer, 1995). For example, Murrell and Valsan (1985) report it as clarified decision-making processes. The *eighth subtheme is confidence* which is reported by Bushe and Coetzer (1995) and Dunn and Holt (2004). The *ninth subtheme is self-understanding* and three papers report positive change (Dunn & Holt, 2004; Pain & Harwood, 2009; Murrell & Valsan, 1985). The *tenth subtheme is goals and roles* where two papers report increased understanding of these (Murrell & Valsan, 1985; Shipherd et al, 2014). *Other themes* are improved ability to cope (Shipherd et al, 2014), improved teammate understanding (Dunn & Holt, 2004) and several themes from Eden (1986) (No improvement: leader support, personal status, order and organization, clarity, leader control, challenge) and Bottom and Baloff (1994) (Improvement: openness, realization, personal inadequacy; No improvement: role ambiguity, resource inadequacy, role load) which are not explained thoroughly enough to interpret here.

The last category is behavioral outcomes. Bushe and Coetzer (1995) report improved participation as does Mazany et al (1995). However, Eden (1986) showed no significant improvement in involvement. From this it is clear that behavioral outcomes are understudied it is difficult to conclude anything from this.

3.2.4 – Long-term outcomes

A few studies had long term measures in their studies. Four studies measure two to three months after the intervention and find no decline in improvements from those measured immediately after the intervention (Eden, 1985 & 1986; Mitchell, 1986; Shipherd et al, 2014). One paper (Dunn & Holt, 2003) measure positive change at the end of a semester. Hence, it is unclear when that specifically is. Three papers find no long-term effects at different times (Unclear when: McClernon & Swanson, 1995; End of semester: Birx et al, 2011; 6 months after intervention: Bayley et al, 2007). Hence, there are indications in both directions. It must be taken into account that these designs are different and for example Dunn and Holt (2003) use a season long intervention which would be expected to develop better long-term effects. But these results show that it cannot immediately be expected to make long-term effects from team building interventions and this aspect must be considered when conducting team building.

4. Discussion

In this discussion I will raise attention to four overall themes. First, I will discuss the themes that emerged from this synthesis. Second, I will discuss a framework of effective leader teams in an attempt to put perspective to the themes. Third, I will discuss how team building could be studied in the future to get a better understanding of the phenomenon. Lastly, I will discuss the limitations of this paper.

4.1 – Theme Discussion

Five overall themes have been found in this systematic review. Here I will discuss these in its entirety in order to answer the research question and draw some general conclusions from this review.

I set out to answer *how team building can help teams become more effective?* From what I have found team building is perceived positively by participants and can make teams more effective in relation to performance outcomes, attitudinal outcomes and behavioral outcomes. These can be influenced through four different elements, goal setting, role clarification, interpersonal relations and problem solving. All these elements can be combined in different ways depending on the situation of the team. Additionally, some of the included studies make use of a diagnosis or data gathering phase before the team building in order to clarify the needs of the team. Some studies also end the intervention with a discussion on how to implement what the team has learned from the intervention.

The intervention designs used in the included studies indicate that team building is not a fixed intervention even though the studies work on the four general elements in various degrees they design the intervention in many different ways. Most of the studies used a short-term workshop and few studies conducted long-term interventions. Even though many used a form of workshop they designed these in many different ways. Other overall designs include activities and team meetings over a longer period. If we go more in depth with each of the four elements, we see examples of what is included in each element but also how these has been worked with. Here it can be noted that these elements can be ditched and the steering giving to the team itself through the approach of appreciative inquiry which focus on what

works for the team and how they optimize their effectiveness through their own experiences with this.

The element of diagnosis or data gathering is used by six studies. The examples that comprise the diagnosis phase are interviews, meeting with the team leader and team to discuss issues, observations and informal interviews outside the team. In addition to these various examples it is worth noting that Dunn and Holt (2003) found that their intervention was experienced as time demanding and therefore it might be a good idea for future interventions to use the diagnosis phase to clarify the available resources for the team so that the intervention does not become too taxing on the team which might be expected to lead to negative consequences. While the element of diagnosis is not discussed in every study some authors believe it is a cornerstone in developmental interventions that aim to improve KSA. While not specifically mentioning team building Salas et al (2012) point to some ideas of what a diagnosis can include which are also relevant for team building interventions. For example, their idea of conducting a diagnosis beforehand is to evaluate whether an intervention is needed or not. When this is established it is important to figure out what the expected outcomes are, how the intervention should be designed, how the intervention should be evaluated and what external factors will help or hinder the effectiveness of the intervention (p.80-81). The variation in designs we have seen in the included studies highlight the need for figuring out how the intervention should be designed. Putting attention to it beforehand will likely increase the chances for fitting the intervention to the needs of the team. Additionally, none of the included studies have drawn attention towards how external factors affect the intervention. However, Bayley et al (2007) in their study found that organizational circumstances did affect the implementation of the training because a high work load, individual working patterns and constrains in regard to financial and time resources hindered the effectiveness of the intervention (p.192-199). Thus, the element of understanding the context that the team is part of seems to be under studied and neglected in the included studies while it could be a major reason for the success or failure of the intervention.

The element of goal-setting is the clearest element. It focuses on goal setting or strategy development in the case of executive teams. In general, the studies work with this element through facilitation of discussions, individual writings that helps to include all team members and the use of the imaginary newspaper. Lu et al (2010) draws attention to different types of goals and indicate that it can have important

effects if teams develop cooperative goals. It might be valuable to study this element further in the future. Furthermore, as this element seem so obvious in nature it might go under radar how teams best develop goals that they can meet in the future. In the future it might be beneficial for studies of team building to be explicit about how goal-setting is approached and also for practitioners. Drawing on coaching psychology it is well established that setting goals for the individual can benefit from using the SMART acronym as a guideline. It states that goals must be specific, measurable, achievable, relevant and time bound. This basic guideline might be beneficial also in the context of teams but at least it is relevant to consider how goal-setting is best worked with and not just assume it is easy to develop.

The element of role clarification is also very clearly understood as clarifying responsibilities and roles in terms of function and purpose. The included studies worked with this element through discussions, individual writings, lecturing and assignments. Additionally, there are also examples of the use of Belbins Team Roles and Work Types to assist the process. However, the idea of role clarification could be extended further. Sheard and Kakabadse (2004) for example suggest defining team roles in terms of the social relations as well (p.20). This suggest that team members not only fill a role professionally, but they also have a role in terms of how they contribute to the well-being of the team. Specifying this responsibility for all team members might increase team function and in effect also the next element.

The element of interpersonal relations is the most widespread and comprehensive element that has the most examples of what is included and how it is worked on. First, it includes working with group morale, norms and values (e.g. internal frames of reference). It also includes how new members are welcomed to the team and how the team function with other teams. Two other main things are the communication in general and resolving conflicts in the team. These various elements have been approached in several different ways. These include discussions, individual writings, lecturing, disclosure of personal and work-related problems, assignments, movie watching, the ‘press conference’, left-hand column, challenging activities, the use of tools (Myers-Briggs type indicator, FIRO-B, Strength Deployment Inventory, Team Signature Technology, Johari’s Window) and the use of games (Desert Survival, Murder One). It is obvious that often times practitioners are called in to conduct team building because a team has some underlining interpersonal conflicts. However, the included studies do not unfold this part fully, and it might suggest that it is dealt with

more ad hoc. In order to add more knowledge to this crucial element let's look at Almost et al (2015) who have reviewed the existing body of knowledge on antecedents of conflicts in health care. They found three groups of antecedents. First, they found that individual characteristics such as personality, cultural background, values and education are important differences that can give rise to conflicts. They suggest that developing self-awareness can help individuals understand how they behave and why this can lead to conflict (p.1499). I suggest that not only self-awareness can be important to mitigate conflict, but also mutual understanding of other team members will benefit the avoidance of conflict. Second, contextual factors are identified as antecedents of conflict. For example, increased workload, understaffing, role overload or ambiguity (p.1499-1500). These issues cannot always be avoided but helping teams develop a culture where team members safely can raise their voice over issues and where leaders reflect upon the influence of contextual factors and act in accordance, might help mitigate internal conflict. Third, the interpersonal level. Specifically, good communication and leaders that used the transformational leadership style. A leadership style where the leader promotes and inspire members to innovate and create change (p.1500). It is clear that the included studies lack a focus on the role of the leader and the ability to include the leader more in the team building and help the leader implement the learnings over time might prove to sustain the effect of team building for longer periods.

The element of problem solving has been focused on developing decision-making processes and the structure of meetings. It has been approached through discussions, individual writings, lecturing, assignments, games (Desert survival, Murder One) and the left-hand column. This element is mentioned very implicitly in all the included papers. However, as with goal-setting it leaves the practitioner with an insufficient understanding of how specifically to approach this element without just replying on their own gut feeling. Hence, while it is beyond this paper to go in depth with decision making processes, I will here draw attention to a decision-making framework that can shed more light on how to establish more effective decision-making processes in teams. Nouwen et al (2012) have developed this framework which has three overall factors that influence effective decision-making. First of all, the *architecture* of the team is important. This relates to having engaged team members that are willing to share and have relevant knowledge. For this to thrive the team needs to develop trust, so members experience the psychological safety necessary to

participate freely in discussions. The last element of the architecture is what they call alignment. This refers to how the team is organized. This involve all elements that can help the team build the necessary infrastructure for decision-making such as having the necessary time for discussions and knowledge management. The second overall factor is *team learning*. It concerns the processes that create learning as a team in contradiction to individual learning. It has two processes. One is what they call collective information processing. This involves how the team process its collective information. This is done through sharing of individual knowledge, an integration of knowledge either through co-construction or constructive conflict and team reflexivity. The latter element concerns the team's reflection on the future and modifications to the team. The other process of team learning is the development of shared mental models. This is developed through the former process of collective information processing. A shared mental model is a shared understand or representation of knowledge in a team. This can be further divided into specific models that concern knowledge about tasks, team functioning and skills of team members. The last overall element of effective team decision-making is *leadership* which is seen to support the team learning and team architecture. Since leadership is a complex field of research, I will omit an extended discussion of this element but highlight that the authors conclude that leadership must facilitate and support the team learning and architecture (p.2102-2105). The example of this model shows that much more can be added to the problem-solving category of team building and it would be wisely to investigate this further in the future to help practitioners avoid working on this matter only based on their gut feeling.

As a last remark some studies also focused on how to implement the learnings from the team building intervention into daily practice. These have focused on developing written contracts or action plans. It has also been worked on during the intervention through a task that helped the team work with the elements with guidance from the facilitator. Last but not least it has also been worked on through a discussion on success and how it can be guaranteed in the future.

Apart from the above design examples I will here draw attention to some other ideas that can be implemented which did not surface in the included studies. One such design is a more minimalistic approach. Maurer (2014) has developed a more simple and direct approach because he wonders if all his previous team building interventions

made any difference at all. Instead he believes that his current simpler approach is more effective. First of all, he only works with teams that themselves identify problems. Hence, they need to take the ownership themselves. Next, he works on identifying the goal of the team and finds that this is the most important part. Therefore, he includes the goal in the rest of the work. The third, possible step is having the team members discuss where in the process of change they are. This step seems like a facilitator of discussion. According to Maurer (2014) he often finds that these steps are what teams need. But some teams also need to discuss internal and external roadblocks (p.13-14). Especially the latter is an element which we have not seen in the included studies and it might be interesting for future studies of team building to look more at how external circumstance can be dealt with. Additionally, it would be interesting to see studies that build on the idea of developing simpler team building designs that aim for effect and not complexity or perfection.

Another design idea that might not fall into the categories used above is debriefings. In the included studies only Dunn and Holt (2003) uses debriefings related to the teams' daily work and not only during the workshop. The authors do not explain further how the debriefings are conducted but other authors have described this in more detail. Reyes et al (2011) describe it as an opportunity to discuss and reflect on experiences. Focusing on possible improvements and successes. They bring up several recommendations for how debriefings can become a success. For example, developing psychological safety for members so that they feel comfortable engaging in the discussions. They also highlight some pitfalls including focusing on the task instead of the teamwork, focusing on safe problems, focusing too much on the past but not the future and being too evaluative. Therefore, they recommend that teams reach agreements on future actions, write these down and follow up on these later on (p.46-51). Hence, this design is not in itself a team building intervention, but it might be implemented as part of a team building intervention and be used as a continuous follow-up on the elements that the team worked with during the team building intervention. This might therefore be the missing link that can make team building interventions more sustainable over time.

Let's turn our attention to the outcomes that were observed in the included studies. The first category of outcomes is performance related. Here mixed results are found for objective measures with two studies finding improvements while two find no

improvements. The subjective measures are more positive with five studies indicating improvements while one finds no improvement. Overall these results have a small indication that team building can improve performance, but both measures are difficult to interpret because they are influenced by several other factors. In addition to this it is worth noting that these results are by no means in full agreement.

The attitudinal outcomes suggested by the include studies span various different factors and are in general supporting that team building can improve attitudinal outcomes for teams. The effects on attitudinal outcomes include: Ten studies that showed improvements in communication and one study indicates mixed results. Nine studies report improvements in cohesion while one shows mixed results. In total four studies indicate positive changes to trust and satisfaction with the team though one of these found the effect had vanished over time. Three studies found improvements in decision-making. Three studies showed improvements in self-understanding and one in team understanding. Two studies found positive changes to confidence in the team, goals and roles. The most mixed theme was conflicts which two studies found improvements on while one found a small improvement and one found no effect. Apart from these several other factors was found by only one study each (Coping, teammate understanding, openness, realization, personal inadequacy), and some studies found no effects on the following (leader support, personal status, order and organization, clarity, leader control, challenge, role ambiguity, resource inadequacy, role load). These results indicate that team building can improve communication, cohesion, trust, team satisfaction, decision-making, self-understanding and confidence in the team. Additionally, more insight is needed in relation to conflicts due to mixed results.

The last group of outcomes is behavioral which is investigated by few studies. Two studies find improved participation while one finds no improvement in involvement. It is difficult to conclude anything in regard to team buildings effect on behavioral outcomes since it is under studied.

The above results are mainly positive in regard to attitudinal outcomes but if we have a look at the studies which investigated long-term effects it indicates mixed results and it is difficult to draw any definite conclusions. Four studies find no decline in improvements two to three months after the intervention and one study finds positive impact after a season long intervention, but three studies indicate that the effects had vanished when measured up to six months after the intervention. These

results are mixed, but it can be concluded that it cannot automatically be expected to create long-term effects when conducting team building.

4.2 – Framework

In this part I will draw attention to a framework for effective leader teams. In this paper I have tried to focus on more than leader teams and this model will not fit every team, but it can serve as a good starting point for understanding effective teams better and therefore also to understand how team building can develop more effective teams. I believe that having a framework or clear theory of how a team becomes effective will benefit team building because practitioners can compare the team with the ideal and work on improving the missing links. The model is called the effect-model and is developed by Bang et al (2015) according to Henriksen and Lundby (2019) (p.20-21). It has not been possible to obtain the original work so I will refer to Henriksen and Lundby (2019) who use and describe it.

As many frameworks in the team literature this model is built on the input-process-outcome model. According to the model the input or preconditions for an effective leader team is to: a) have a clear purpose, that identify why the team exist and what value it brings to its organization (p.22). This element will be beneficial to all teams not only for leader teams. In relation to team building this element relates to goal-setting, but it could be interpreted as being more because here the team needs to identity why it exists and therefore the answer ultimately might be that it should not. In comparison setting a goal could be done per automatic without relating to the core purpose of the team. B) The second element is that the team must work with real assignments that relates to its core purpose. Hence, this also means that the team should not work with assignments that could not be solved better by other teams (p.22). This element relates back to the previous in the sense that if the team works with real assignments it has a valuable purpose because these assignments could not be solved better elsewhere. This element is also seen as being relevant for all types of teams. C) The third precondition is the composition of the team (p.22). This element is relevant for all teams to consider for example the personal chemistry, the professional competences and the size of the team. It would fit into working with the interpersonal relations, but it has a more foundational character since it can entail making changes to the composition by adding or removing people. In relation to the included studies

on team building no studies has challenged the very composition of the teams. This is to be expected as often times team building interventions work with an existing team that has been decided to work together from elsewhere. However, if a team is composed in a specific way that creates problems it might be beneficial to work on the composition before working on anything else. Henriksen and Lundby (2019) for example mention in relation to effective leader teams that having too small or too large leader teams can hinder the effectiveness by either involving too few perspectives or by making it difficult to agree and develop commitment (p.22). D) The last element of preconditions is systematic support which involves having some systematic elements that support team work. In the case of a leader team that could be economic reward systems that focus on team goals rather than individual goals for each department (p.22). This element will probably not fit every team, but it is worth keeping an eye on when working with teams whether or not they have some systematic elements that works for or against team work.

The next part of the model is the processes of the teamwork: A) The first element is referred to as clear orderings. This refers specifically to communicating clear about the content of meetings in order to make the agenda of meetings more effective (p.23). This element is very much focused on leader teams as they usually work through meetings. B) The next element relates to the previous as it entails being focused at meetings (p.23). These two elements refer specially to leader team meetings but if they are converged to the daily work of other teams it would be beneficial to having clear communication of which tasks are important and being focused when needed. C) The third element is about teams being able to have assignment conflicts (p.24). If we relate it to other types of teams then these could potentially benefit from being able to include conflicts that involve tasks but without increasing relational conflicts. This distinction might be used if team building focus on developing a team's ability to avoid its own relational conflicts in the future. This would also help the team to utilize its differences which potentially will make them more effective through decision-making as Nouwen et al (2012) also suggest. Henriksen and Lundby (2019) also refer to this as the quality of the dialog which means the ability to investigate different opinions in the team without fighting to win arguments or simply just avoid speaking your mind to stay safe. Having the balance will resemble a good dialog quality (p.24). D) The fourth element is having good relations with external milieu (p.25). This element might be especially beneficial for leader teams, but most teams

would benefit from having good relations to other teams or stakeholders around them as they can draw support, information and other important resources from these. E) The last element is the team's ability to learn continuously (p.24). This element builds on the mistakes and success the team has and its ability to decrease and increase these. This also resembles the concept of team reflexivity proposed by Nouwen et al (2012). This could be seen as an internal version of team building with no outside facilitator where the team by itself works on improving its effectivity. It might be helpful for teams if this was part of the team building learnings where the external facilitator helped the team developing this practice. All these processes that relates to the team's ability to work as a team must be accompanied by effective team leadership according to the model. Effective leadership centers on the leader's ability to understand the elements in the model and use it together with his or her specific role in the group (p.25). It is interesting that this model and the model by Nouwen et al (2012) draw attention to the role of the leader while none of the included studies focused specifically on developing the role of the leader in relation to the team. This might be a whole different intervention where the focus could be entirely on the leader, but it would be beneficial for the sustainability of the team building intervention if the leader is made more responsible for developing and sustaining the effectivity of the team in the everyday practice.

The last element of the model is about the output or results of the team processes. This involves developing added value to the organization, the team and the individual. It is clear that a team is developed in order to add value to an organization, but the model also highlight that the added value to the team in the form of better teamwork will make it more viable over time. The same holds true for the individual which needs to find it valuable to work in the team. This will be individual what makes it valuable, but examples could be personal development or increased well-being. This framework gives an example of how which factors that makes a team more effective. For practitioners that conduct team building it is worth going more in depth with such frameworks in order to understand how a team can become more effective.

4.3 – Future Studies

In this section I will discuss how future studies on team building could look like with an eye to the shortcomings found in this review. First of all, some general considerations about the design and reporting of studies includes the design of the intervention, the measures used and the transparency of the study.

This review has showed that a number of different team building designs exist, but future studies could with advantage dive more into the details in the four elements (goals, roles, relations, problem solving) and diagnosis. Either through a singular focus on one of the elements or through real world cases that studies all five elements in its entirety. Apart from this, the current review also indicates that mixed method designs can be used with advantage because the different data types can shed light on different perspectives and either support or contradict each other. For example, when it comes to performance measures. When it comes to measures this review has showed that a huge difference in inventories exist and that makes it difficult to compare outcomes across studies and generalize about these. Additionally, having common measures between studies would enable the use of a meta-analysis which could lead to stronger conclusions about the effects of team building. The transparency of the included studies centers on the often times lack of transparency when it comes to the included measures but also the intervention. It is simply impossible to compare different studies if it is unclear how the intervention is conducted in rich detail. For this review it could have been interesting if the questionnaires for each study were available as an attachment so that it could have been clear how for example cohesion has been investigated. Apart from the above considerations there also lack studies on longitudinal interventions. These would shed more light on how a longitudinal intervention could look like and if the effects would be sustained by the continuous intervention. A last element which would increase the strength of future studies is that they include all three outcome measures (performance, attitudinal, behavioral). Especially the latter element lack attention.

A concrete study that has not been found in this review is an investigation of how team building can support a new team going through Tuckmans (1965) phases (forming, storming, norming, performing). It would be interesting in the future to get insight on how team building in general can support a newly developed team over time through each phase.

An understudied element in the included studies is how the facilitator affects the intervention. This could be explored better by simply letting participants evaluate the facilitator through a questionnaire or more in-depth through an interview. It could also be explored more selectively by having one team building intervention design that is manualized and then having different facilitators conducting it to a number of teams. In that way it would be possible to investigate more what is important in terms of the facilitator without having interference from the design that could affect the view of the facilitator.

Another element of team building that must attract more attention going forward is conflicts which has showed mixed results in this review which indicate that it could be an element that is not sufficiently understood. Hence, it would be beneficial to investigate this matter more exclusively while excluding other elements of team building and solely investigate how conflicts can be resolved in teams and also how future conflicts can be prevented or how teams can be enabled to solve these on their own in the future.

4.4 – Limitations

In this section I discuss the limitations in this review. *First* of all, it is a limitation that this paper was only conducted by one reviewer. This is vital in regard to three areas. The review of articles, critical appraisal and synthesis. The review of articles would be strengthened if another reviewer had the chance to go through the search hits and evaluate which of these were eligible for this paper. The critical appraisal would also be strengthened from having a discussion between two reviewers as to decide the quality of the included studies. Likewise, would the thematic analysis especially because this does not follow any fixed conventions for theme development and therefore having two reviewer would develop a more thorough discussion of themes. This being said this paper has followed fixed standards for the systematic review and been transparent about the process and therefore other reviewers would be able to go through the process again and change the steps that they disagree with.

Second of all this review made use of a thematic synthesis method which is weakly defined in terms of its approach. Hence, it gives room to develop a synthesis that develops lots of different themes depending on how the reviewer reads and interprets the included studies. This is a weakness, but the synthesis must be evaluated

by its meaningfulness and thereby not everything will count as a valuable contribution. Though this synthesis method has its weakness it also makes several systematic reviews possible because the reviewer is given more room to develop valuable themes from the literature.

Third, in this paper I faced a challenge of having different types of data and decided to solve it through qualitizing. It is clear that this is a contested field that is very new and needs more development, including some clear guidelines for the process of qualitizing and interpretation of qualitized data. It follows from this that a main limitation is its unclear process of how to qualitize data. I have tried my best to resolve this issue by explaining my approach and rely heavily on the authors own interpretation of results. Additionally, I believe the use of qualitizing has had the important benefit that I have been able to include five mixed-methods studies that would only be used partly and nine quantitative studies that would be excluded completely if I did not qualitize the data. It is worth noting that I extract valuable knowledge from these in terms of how to design team building intervention, which results that can be expected and how different team building studies measure their intervention. I believe all these things adds to the field and leaves us better off than before this review.

Fourth, when it comes to the applied search it can often become better if time and resources is not a constrain. I believe my search could be improved in several respects. First, my search does not include master theses and dissertations. These could bring new studies to the surface and bring new information forth. Second, if I reduced my use of index terms it might reveal studies that by mistake was excluded through index terms. Third, a wider search including abstracts might have added a few more studies but it is not expected to change much. Fourth, a search that included goal setting, role clarification and words relating to problem solving (e.g. decision-making) and interpersonal relations (e.g. trust, conflicts) might turn up studies that focus more exclusively on each of these elements. Fifth, an increase in the number of used databases would potentially have increased the number of included studies.

5. Conclusion

In this paper I have conducted a systematic review on team building interventions and answered the following research question: How can team building help teams become more effective? The systematic search yielded 19 studies that were deemed eligible for this paper. Based on these studies I made a thematic synthesis that developed four overall themes. The first theme is perception of the intervention. The learning points from the included studies are that in general various forms of team building interventions are perceived as being positive for the team and individual. It can be used to facilitate more open communication and give room for the more silent participants. Additionally, it has the potential to be experienced as powerful. However, attention must be drawn to the demands it puts on the participants and attention must also be drawn to team problems that are unspoken.

The second theme involves the design of the team building interventions. It was found that no fixed design exists but all studies, apart from one, worked with one or more of the following elements: goal-setting, role clarification, interpersonal relations and/or problem solving. Apart from these four elements some studies also used a data-gathering or diagnosis beforehand and some studies also had a focus on how the intervention was implemented in the everyday work of the team. One study used appreciative inquiry where members of the team used their own understanding of what has made them effective in the past to improve team effectiveness. Other overall designs are workshops, activities or longer interventions with continuous team meetings. Looking more specifically on each element we see that diagnosis is about figuring out whether team building is needed or not, what the expected outcomes are, how the intervention should be designed, how the intervention should be evaluated and what external factors will help or hinder the effectiveness of the intervention. The included studies have approached this through interviews, meeting with the team leader and team to discuss issues, observations and informal interviews outside the team. Goal-setting has in general been worked with through facilitation of discussions, individual writings that helps to include all team members and the use of the imaginary newspaper. The element of role clarification has been worked with through discussions, individual writings, lecturing and assignments. The element of interpersonal relations includes working with group morale, norms, values, how new

members are welcomed to the team, how the team function with other teams, communication in general and resolving conflicts in the team. These various elements have been approached in several different ways. These include discussions, individual writings, lecturing, disclosure of personal and work-related problems, assignments, movie watching, the 'press conference', left-hand column, challenging activities, the use of tools (Myers-Briggs type indicator, FIRO-B, Strength Deployment Inventory, Team Signature Technology, Johari's Window) and the use of games (Desert Survival, Murder One). The element of problem solving focuses on developing decision-making processes and the structure of meetings. It has been approached through discussions, individual writings, lecturing, assignments, games (Desert survival, Murder One) and the left-hand column. The element of implementation has focused on developing written contracts or action plans. It has also been worked on during the intervention through a task that helped the team work with the elements with guidance from the facilitator and through a discussion on success and how it can be guaranteed in the future. All these elements can be used in different combinations to help teams become more effective.

Turning to the third theme that is outcomes which is understood in terms of effectiveness. It is defined as comprising performance, attitudinal and behavioral outcomes. The performance outcomes found in the included studies suggest mixed results with some objective performance outcomes improving and some not. The subjective performance measure indicate improvement in five cases, and one shows no improvement, but these measures might be misguiding because team members might wish to experience improvements from the intervention. Hence the overall picture of performance outcomes is mixed, and it cannot be taken for granted that team building will improve performance. Attitudinal outcomes support the idea that team building can improve these. The included studies suggest improvements in relation to for example communication, cohesion, trust and satisfaction with the team. Behavioral outcomes are the least reported and because these studies are not in agreement it is difficult to conclude anything from this. The fourth theme is long-term outcomes and the included papers show mixed results. Hence, team building cannot necessarily be expected to develop long term results for teams. All taken together team building is not a fixed design, but it works with some overall elements more or less. Each element can be implemented in various ways and it might be beneficial to diagnose the team to find out how it fits the team. It was also found that teams can become more effective

in terms of attitudinal outcomes, but mixed results are indicated for behavioral and performance outcomes. Additionally, mixed results were found for long-term outcomes, which indicate that teams not necessarily become more effective in the long run by participating in team building.

Appendix 1 – Search Indexes

PsychInfo:

- Age group: Adulthood (18yrs & older)
- Population group: Human
- Peer-reviewed journals only

EbscoHost:

- Journales included: Academic Search Premier, Business Source Premier, ERIC, SPORTDiscus and Teacher Reference Center.
- Peer-reviewed journals only
- Tesaurus: Team building, English

Scopus:

- English
- Articles
- Tesaurus: Team building, published papers

Appendix 2 – Critical Appraisal

Category of study designs	Criteria	Bushe & Coetzer (1995)	Bayley (2007)	Birx et al (2011)	Bottom & Baloff (1994)	Clark et al (2012)	Dunn & Holt (2003)
Screening questions (for all types)	S1	Yes	Yes	No	Yes	Yes	Yes
	S2	Yes	Yes	No	Yes	Yes	Yes
1. Qualitative	1.1						Yes
	1.2						Yes
	1.3						Yes
	1.4						Yes
	1.5						Yes
2. Quantitative randomized controlled trials	2.1						
	2.2						
	2.3						
	2.4						
	2.5						
3. Quantitative nonrandomized	3.1	Yes			Yes		
	3.2	Yes			Yes		
	3.3	Yes			Yes		
	3.4	Yes			Yes		
	3.5	Yes			Yes		
4. Quantitative descriptive	4.1					Yes	
	4.2					Yes	
	4.3					Yes	
	4.4					Can't tell	
	4.5					Yes	
5. Mixed methods	5.1		Yes	Yes			
	5.2		Yes	Yes			
	5.3		Yes	Yes			
	5.4		Yes	Yes			
	5.5		Yes	Yes			

Category of study designs	Criteria	Dunn & Holt (2004)	Eden (1985)	Eden (1986)	Goldberg (2000)	Gordon & Elmore Jr. (1984)	Lu et al (2010)
Screening questions (for all types)	S1	Yes	Yes	Yes	Yes	No	Yes
	S2	Yes	Yes	Yes	Yes	No	Yes
1. Qualitative	1.1	Yes			Yes	Can't tell	
	1.2	Yes			Yes	Can't tell	
	1.3	Yes			No	No	
	1.4	Yes			No	No	
	1.5	Yes			No	No	
2. Quantitative randomized controlled trials	2.1						
	2.2						
	2.3						
	2.4						
	2.5						
3. Quantitative nonrandomized	3.1		Yes	Yes			
	3.2		Yes	Yes			
	3.3		Yes	Yes			
	3.4		Yes	Yes			
	3.5		Yes	No			
4. Quantitative descriptive	4.1						Yes
	4.2						Yes
	4.3						Yes
	4.4						Yes
	4.5						Yes
5. Mixed methods	5.1						
	5.2						
	5.3						
	5.4						
	5.5						

Category of study designs	Criteria	Mazany et al (1995)	McClernon & Swanson (1995)	Mitchell (1986)	Murrell & Valsan (1985)	Pain & Harwood (2009)	Pollack & Matous (2019)	Shipherd et al (2014)
Screening questions (for all types)	S1	No	Yes	No	Yes		Yes	Yes
	S2	No	Yes	No	No		Yes	Yes
1. Qualitative	1.1				Yes			
	1.2				No			
	1.3				No			
	1.4				No			
	1.5				No			
2. Quantitative randomized controlled trials	2.1							
	2.2							
	2.3							
	2.4							
	2.5							
3. Quantitative nonrandomized	3.1		Yes	Yes				
	3.2		Yes	Yes				
	3.3		Yes	Yes				
	3.4		Yes	Can't tell				
	3.5		Yes	Yes				
4. Quantitative descriptive	4.1	Yes					Yes	
	4.2	Yes					Yes	
	4.3	Yes					Yes	
	4.4	Yes					Yes	
	4.5	Yes					Yes	
5. Mixed methods	5.1					Yes		Yes
	5.2					Yes		Yes
	5.3					Yes		Yes
	5.4					Yes		Yes
	5.5					Yes		Yes

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