Online Readings in Research Methods
(ORIM)

Chapter 1

Introduction to and application of mixed methods research designs

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Recommended Citation

Roomaney, R. & Coetzee, B. (2018). Introduction to and application of mixed methods research designs. In S. Kramer, S. Laher, A. Fynn, & H. H. Janse van Vuuren (Eds.), Online Readings in Research Methods. Psychological Society of South Africa: Johannesburg. https://doi.org/10.17605/OSF.IO/ BNPFS

INTRODUCTION

In the social and behavioural sciences, mixed methods research (also known in the literature as mixed methodology, methodological triangulation and combined research) traces its lineage to the multi-trait/multi-method (MTMM) approach originally developed by Campbell and Fiske (1959). While Campbell and Fiske are largely credited with formalising the use of multiple methods, mixed approaches were used by researchers even prior to their work (see Johnson, Onwuegbuzie, & Turner, 2007). Through the years, researchers and methodologists such as Campbell and Fiske contended that the best approach to answering the many complex research questions characteristic of social and behavioural sciences required the integration of both quantitative and qualitative methods. Campbell and Fiske (1959) thereby also advanced our understanding of the notion of triangulation (a term coined later by Webb, Campbell, Schwartz and Sechrest (1966)). In their paper, the authors referred to 'multiple operationalism', i.e. using multiple methods to validate one another and thus ensuring that findings were a true reflection and explanation of a particular phenomenon and not an artefact of the methodology used (Campbell & Fiske, 1959). The formalised process of triangulation, however, was only described much later (see Denzin, 1978; Jick, 1979; Sieber, 1973).

As the idea of mixed methods and mixing methods evolved, so too did its definition (Johnson et al., 2007). Johnson et al. (2007) provide a comprehensive list and summary of 19 definitions of mixed methods based on discussions with expert mixed methodologists. One of the earliest definitions of mixed methods research was proposed by Greene, Caravcelli and Graham (1989), who simply stated that mixed method designs include at least one qualitative method and one quantitative method. Since then, many methodologists have proposed alternate definitions for mixed methods, all building on the earlier definitions (see Creswell & Plano Clark, 2007; Johnson & Onwuegbuzie, 2004; Morse & Niehaus, 2009; Tashakorri & Creswell, 2007). Plano Clark and Ivankova (2016, p. 59) define mixed methods research as "a process of research when researchers integrate quantitative methods of data collection and analysis and qualitative methods of data collection and analysis to understand a research problem".

Today, there are numerous debates surrounding the use of mixed methods as an approach to research. These debates include issues such as what constitutes mixed methods, what are the philosophical stances that underlie mixed methods, and which research questions lend themselves to mixed methods research. Mixed methods studies often involve researchers with competency in both paradigms, but can also consist of teams of researchers with different methodological expertise that complement one another. Given the complex nature of social phenomena, combining qualitative and quantitative methods stems from the recognition that both sets of methods are necessary in order to investigate and fully understand these phenomena. Take the issue of mental health experiences of methamphetamine users in Cape Town. Watt, Myers, Towe and Mead (2015) noted that while there existed a link between methamphetamine use and increased levels of psychological distress, little attempt had been made to explore the mental health needs of methamphetamine users in South Africa. In this instance, both qualitative and quantitative methods were required in order to answer their research question - What are the mental health needs of methamphetamine users in South Africa? (Watt, Myers, Towe & Meade, 2015). As such, the researchers conducted a cross-sectional survey of 360 methamphetamine users (the quantitative component) and conducted in-depth interviews with 30 users (qualitative component) in a township in the Western Cape. Using mixed methods, the researchers were afforded a broader understanding of the mental health experiences and needs of methamphetamine users.

In their seminal paper, Greene et al. (1989) highlight five important justifications for using or deciding to adopt a mixed methods approach. These were for (1) triangulation, (2) complementarity, (3) development, (4) initiation and (5) expansion. Each of these justifications, based on the reasons provided by Green et al. (1989), are described in Table 1 below. It is important to note that other rationales for using mixed methods exist (see Collins, Onwuegbuzi, & Sutton, 2006).

Table 1. Five justifications for using mixed methods

Justification	Description	Example
Triangulation	Used when researchers seek convergence or to test the validity of the results used from combining various methods to study the same phenomenon.	Useful to compare and contrast research findings obtained through the use of surveys against findings obtained through interviews.
Complementarity	Used when researchers seek to elaborate on or provide clarification on the results obtained using a method with results obtained from using another method (i.e. when qualitative and quantitative results are used to assess overlapping components of the overarching phenomena under investigation).	Useful when the results of direct observations or interviews are used to complement the findings of a survey.
Development	Used when it is anticipated that one method of research will influence or inform subsequent methods of research.	Useful when interviews with university students regarding a specific course might suggest that more accessible forms of learning be incorporated into the course material. Subsequent methods of research will explore more accessible forms of learning.
Initiation	Used to resolve conflicting results or to stimulate new research questions and ideas (i.e. using contradictions in findings to formulate or reframe research questions).	Useful when interviews with postgraduate students on supervision might challenge common perceptions that students and supervisors tend to get along.
Expansion	Used when clarity about results of a study are required. Or, when different methods are used to gain more in-depth knowledge about the results of a study.	Useful if prevalence rates suggest that condom use is low amongst adolescent men and researchers then conduct qualitative interviews with adolescent men to explore the reasons for low rates of condom use.

We begin this chapter by highlighting the ongoing debates surrounding mixed methods. We will then go on to describe different mixed method designs and key features associated with each of these designs. We then illustrate two specific

research designs, namely parallel/convergent and sequential designs. We do so by describing studies that employed these designs. We then briefly discuss what does not constitute mixed methods. Finally, we will conclude this chapter by discussing the dissemination of mixed methods studies and some ethical considerations when using mixed methods designs.

THE PARADIGM DEBATE

Mixed methods have been critiqued for combining qualitative and quantitative methods, and therefore by extension qualitative and quantitative paradigms. Traditionally, researchers have been encouraged to select a paradigm within which to conduct their research. Barnes (2012) states that the separation between qualitative and quantitative paradigms is evident in the manner in which research methodology is taught and conceptualised in methodology texts. Research methodology courses in South Africa are either focused on qualitative or quantitative research, with very little integration of the two paradigms. In order to understand this divide it is necessary to define paradigms.

The concept of paradigms was first introduced by Thomas Kuhn (1962). It refers to a common view held by a scientific community. Members of a specific scientific community adopt and are committed to specific beliefs regarding concepts, theory, methods, etc. At a broad level, the paradigm choice is generally between qualitative and quantitative. The qualitative paradigm is often regarded as interpretivist and the quantitative paradigm as positivist. However, it is important to note that interpretivism and positivism are not the only approaches within these broader paradigms. Each paradigm is characterised by its own axiology, ontology, epistemology and methodology (for more detail on this please refer to Biesta (2010)). The paradigms are often presented in stark juxtaposition to one another, as binary opposites. For example, quantitative research is usually presented as being objective, whereas qualitative research is considered to be subjective. Therefore, on many levels, the two paradigms are incompatible as they represent opposing views with regard to research. Howe (1988) therefore contends that qualitative and quantitative research are separate and incompatible paradigms. However, the promulgation of the notion that qualitative and

quantitative paradigms are separate, mutually exclusive paradigms is problematic as it fails to take into account the complexity of these paradigms. Furthermore, Hammersley (1997) asserts that the crude distinction between the paradigms is often misleading. This distinction between paradigms results in researchers focusing on the differences between paradigms rather than their similarities. Paradigms are contested areas as they are far less parsimonious than some textbooks infer. For example, within the qualitative paradigm, tensions exist between relativism and constructivism and there is also contention with regards to levels of subjectivity in research.

Methodologists supporting the mixed methods movement have grappled with ways to circumvent this philosophical battle in order to support a mixed methods approach. Hammersley (1997) contends that we can mix methods without clinging to one philosophical view. Methodology should be put before epistemology and we should not only view the qualitative and quantitative paradigms as dichotomies but rather view them on a continuum, as this leaves us with a range of possibilities for research. According to this view, mixed methodologists do not attempt to reconcile the epistemology of qualitative and quantitative paradigms, but rather combine methods. Another stance is that mixed methods are used to compensate for the methodological shortcomings of the qualitative and quantitative paradigms. Burke Johnson and Onwuegbuzie (2004) further assert that methodological pluralism provides superior results compared to monomethod research. In research practice, both paradigms have been combined and produced good results (Biesta, 2004). The next section outlines another contested area in mixed methods – i.e. the mixed methods typologies.

Methodologists today largely contend that the underlying philosophical assumption that underpins mixed methods is pragmatism. In contrast to the 'incompatibility thesis' alluded to earlier, pragmatism argues that the way in which we obtain knowledge and make sense of the world should be achieved by considering all view points and perspectives pertaining to a particular phenomenon. Thus, within this paradigm, the question of 'what is the best

approach to answering a research question?' is of utmost importance (Johnson et al., 2007; Onwuegbuzie & Leech, 2005).

MIXED METHODS TYPOLOGIES

There are many ways in which qualitative and quantitative methods may be combined in research. As such, there are many types of mixed methods designs that researchers can draw on. There are also different names given to mixed method research designs. In some cases the same design is ascribed different names by different methodologists. These designs are useful because they provide researchers with a framework to conceptualise studies in order to best answer their research question(s).

Studies may either employ fixed or emergent mixed methods designs (Cresswell & Plano Clark, 2011; Morse & Niehaus, 2009). In studies that employ a fixed research design, the researchers determine the methods used in the study at the beginning of the study. All components are therefore pre-planned or fixed. Conversely, emergent mixed methods designs develop during the course of the study. In such cases, studies start out as purely qualitative or quantitative and researchers decide to incorporate a complementary component (e.g. add a qualitative component to a quantitative study) as the study progresses. This may be due to unexpected findings or when the findings yielded in a study are insufficient in answering the research question.

Three factors are usually taken into consideration when planning mixed methods designs. These are timing (sequence), priority (favouring one method above the other) and synthesis (how is the data being 'merged'). Timing (also referred to as sequence) refers to the temporal relationship between the qualitative and quantitative components. Studies are usually referred to as parallel or concurrent (i.e. the qualitative and quantitative components are carried out simultaneously) or as sequential (i.e. when one component is completed before the other component begins). Priority refers to the importance of the qualitative and

quantitative strands within the mixed methods design. Some studies may prioritise the qualitative and quantitative strand equally, whereas other studies may give preference to one strand over the other (i.e. prioritise qualitative over quantitative or vice versa). Finally, synthesis has to do with the way in which the findings of the qualitative and quantitative components are combined. Researchers use the findings of one component to explain the other component, to explore the findings of the other component or for triangulation purposes. These three factors are essential in the decision-making process when planning mixed methods research and are key features that distinguish between the different research designs on offer.

The research designs are often presented as mixed methods research typologies. A design typology is "a set of different possible mixed method designs that attempt to convey the range of design options available" (Plano Clark & Ivankova, 2016, p. 111). Various mixed methods research typologies are available to researchers. Typologies have been proposed by Creswell and Plano Clark (2011), Greene, Caracelli and Graham (1989), Morse and Niehaus (2009), Sandelowski (2000), Teddlie and Tashakorri (2009), and many more. For the sake of brevity we will only describe the typology presented by Creswell and Plano Clark (2011). This typology was chosen as it provides a simple, yet comprehensive overview of mixed method designs and due to the typology's inclusion of priority, timing and methods of mixing in the various designs. Our decision to present this particular typology should not be interpreted as prescriptive to the reader.

The six major mixed methods designs by Creswell and Plano Clark (2011)

Creswell et al. (2011) describe six major mixed methods designs. These designs are: the convergent design, the explanatory design, the exploratory design, the embedded design, the transformative design and the multiphase design. Whilst the designs set out by Teddlie and Tashakorri (2009) only take sequence and mixing into account, Creswell and Plano Clark (2011) also include priority of methods. Thus, these designs are more accurately referred to as the convergent parallel design, explanatory sequential design, exploratory sequential design,

embedded design, transformative design and multi-phase design. In what follows, we provide an explanation of each of these designs and supplement them with hypothetical examples of research. These examples provide the reader with an indication of what constitutes a good mixed methods research question.

The convergent/parallel design (Notation: QUAN + QUAL)[1]

In this design, both the quantitative and qualitative strands of the study run simultaneously. Further, because both occur simultaneously, they take place within the same phase of research. As such, both strands are prioritised equally. Each strand take place independently until the analysis of data is complete. It is only at this point that the results are mixed and interpreted together. A researcher might adopt the convergent design to develop an overall understanding of adolescent females' knowledge and attitudes towards sexual and reproductive health (SRH) services in South Africa (Research Question: What are female adolescents' knowledge and attitudes towards SRH services in South Africa?). To do so, researchers might use surveys, interviews and focus groups with female adolescents about their attitudes towards and knowledge of SRH services. The survey data are then analysed using quantitative means, while the interview and focus group data are analysed qualitatively. The results are then combined to highlight instances where attitudes and knowledge of SRH either converge or diverge.

The explanatory sequential design (Notation: QUAN →qual)

In this design the quantitative and qualitative strands take place in two distinct, yet interactive phases. In the first phase quantitative data is collected and analysed and takes priority for addressing the research questions. Following the quantitative phase is the collection and analysis of qualitative data. The results of the quantitative phase are used to inform data collection and analysis in the qualitative phase. The qualitative results are used to gain insight into the quantitative findings. Using the same topic as provided above, quantitative data

[1] Mixed methods notation was introduced by Morse (1991). Uppercase letters are used to place greater emphasis on a method. The use of the (+) denotes convergence, and the use of the (→) denotes sequence.

may be collected and analysed with the purposes of identifying risk factors associated with safe sex practices among adolescent females. In order to gain a more in-depth understanding of these risk factors in the context within which they occur, researchers could conduct interviews with adolescent females.

The exploratory sequential design (Notation: QUAL → quan)

In this design, timing of the phases is also important. Unlike the explanatory design, this design begins with the collection and analysis of qualitative data. The researcher then attempts to test or generalise the qualitative findings by conducting a quantitative study in a subsequent phase. The researcher then uses the quantitative results to further their understanding or build on the knowledge obtained in the qualitative phase. For example, the researcher might initially conduct interviews with female adolescents about their experiences of SRH services. On completion of the analysis the researcher may identify various individual and structural barriers and facilitators associated with SRH services. These may then become variables that form part of a quantitative instrument to determine the salience of each of the factors in a much larger sample.

The embedded design (Notation: QUAN (qual) or QUAL (quan))

In this design, the researchers collect and analyse quantitative and qualitative data within a traditional quantitative or qualitative design. Thus, a qualitative strand may be added to a quantitative study or vice versa. The addition of either strand is used to improve on the initial design and to better answer the research questions. For example, if a researcher were interested in designing an intervention to identify strategies to overcome barriers to accessing SRH services amongst adolescent females, he/she might begin with focus groups to learn how adolescents address these challenges within available resources. Using this knowledge, the researcher then develops an intervention that tests these strategies by means of an experimental design using a number of different sites to validate the findings.

The transformative design (Notation: QUAL →←QUAN)

In this category, the researcher shapes the design using a transformative theoretical framework. Here, transformative denotes eliciting the use of theory; in particular theories that consider social phenomena through a transformative lens. This design may be considered useful and important to navigating research on social justice in South Africa. Barnes (2012) argues that while qualitative research has been the predominant method of research used to elicit critical and transformative research on issues related to social justice, mixed methods may offer important insight into, "both the magnitude of these issues as well as to qualitatively understand them in contemporary South Africa" (p. 467, emphasis in original). Decisions regarding the timing, priority, and interpretation of the data are all taken with this framework in mind. Given the ongoing example in this section, a transformative mixed methods research design may be well suited to the researcher who wishes to use a feminist perspective to quantitatively identify and then qualitatively expand on how stereotypical views on female adolescents places them at a disadvantage to accessing SRH services.

The multi-phase design (Notation: QUAL→QUAN→ [QUAN + qual])

In a multi-phase design, sequential and concurrent strands are combined over a period of time. Such a design is useful when a program is implemented to address an overarching objective. For example, a program evaluation can assess whether a program achieves its objectives. Both qualitative and quantitative methods are used to continually develop, adapt and evaluate a specific program. A researcher might start by conducting a qualitative needs assessment to understand adolescents' perspectives on current SRH services. Using these data, the researcher develops a quantitative measure to quantify these findings. Then, in a third phase the researchers might design an intervention and evaluate the outcomes.

EXAMPLES OF MIXED METHODS STUDIES

In this section we will present and explain two examples of mixed methods research in South Africa. Both of these studies are ongoing projects. Therefore, we will reflect on the chosen mixed methods approach in each rather than discuss their findings. Thus, we will provide a short description on the study, present the

notation used for the method employed in the study, and describe how each method was applied.

Example 1: Convergent/parallel mixed methods design (INFANT study team*) (Notation: QUAN + QUAL)

As mentioned previously, in the convergent design, qualitative and quantitative data are collected and analysed independently prior to being merged for interpretation. Upon merging, researchers look for ways in which the data either converge or diverge from each other. Further, researchers also look for contradictions or ways in which the data relate to each other (Creswell et al., 2011). The ongoing research being done by the INFANT study team[2] illustrates how the convergent design may be applied in practice. At the time of this writing, the researchers have not yet published data that merge both qualitative and quantitative findings. However, various other papers from the large study has already been published (see Coetzee et al., 2017; Henrick, Yao, Drannik, Abimiku, & Rosenthal, 2014; Henrick, Yao, Rosenthal, & INFANT study team, 2015). For the purposes of this chapter, we will only reflect on the design of the study. In keeping with the convergent design the study investigates both a quantitative question as well as a qualitative question. The purpose of the study was to determine the innate, adaptive and mucosal immune responses in HIV-1 exposed uninfected infants in South Africa and Nigeria. The team aims to provide a human model to understand correlates of immune protection. As can be seen from Figure 1 below, the quantitative question is concerned with the immunological factors and mechanisms that prevent HIV transmission in HIV-1 exposed uninfected infants, while the qualitative question is concerned with the social practices and beliefs regarding breastfeeding mode, mother-to-child transmission (MTCT) and vaccine testing.

[2] The INFANT study team comprises of a multidisciplinary group of local and international researchers (Rosenthal KL, Abimiku A, Gray CM, Cameron DW, Ball TB, Jaspan H, Burgener A, Blackburn J, Kagee A, Tomlinson M, Singer J, Kiravu A, Osawe S, Datong P).

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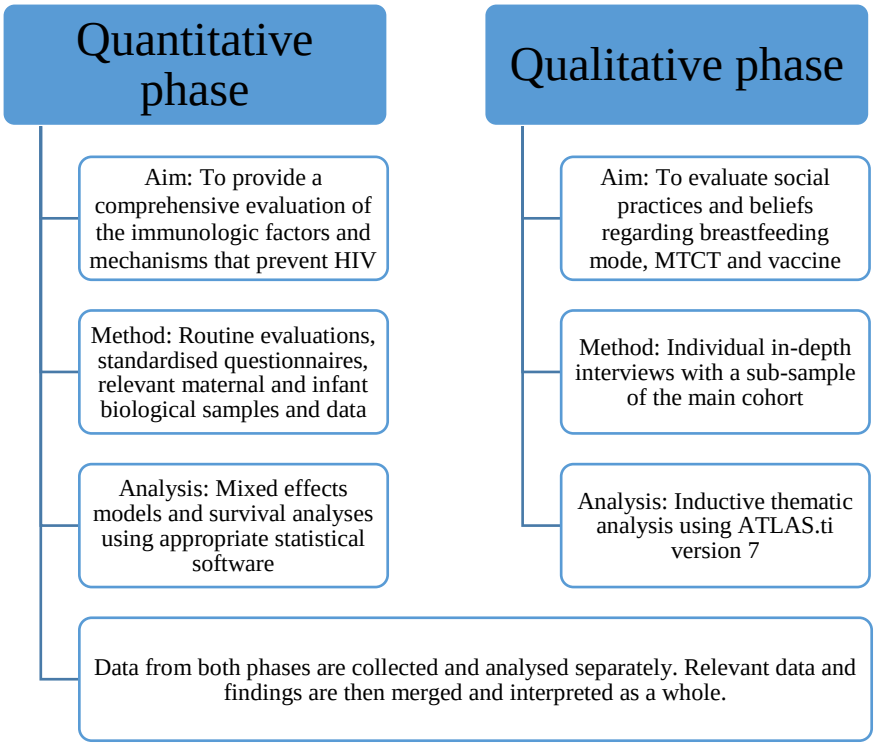

Figure 1. An overview of the application of the convergent/parallel design

To achieve this, the researchers sampled a convenience sample of 500+ (300+ Nigeria; 200+ South Africa) HIV infected mothers who elected to breastfeed their infants. The mother child pairs were then followed from birth to evaluate immune activation, HIV transmission and also, vaccine responsiveness in relation to breastfeeding practice, exclusive breastfeeding or mixed feeding. In the quantitative study routine clinical evaluations (medical history and comorbidities, physical, HIV disease history, ART treatment, most recent plasma HIV-RNA if available and CD4 count), and feeding practices (as determined by a structured feeding questionnaire) were assessed.

Laboratory specimens such as infant saliva, breast milk samples, blood from the infant as well as blood from the mother were also collected. Statistically, mixed model effects were used to assess the impact of breastfeeding practices on various outcome measures. Further, survival analyses were conducted to evaluate the impact of breastfeeding practice on HIV transmission and the relationship between immunologic factors in breastmilk and immune activation and HIV transmission.

In the qualitative study, in-depth interviews were conducted with a sub-sample (selected at random) of HIV infected women in their third trimester of pregnancy as well as one month after birth to determine womens' feeding intentions, influences on feeding decisions as well as factors affecting women's abilities to adhere to exclusive breastfeeding practices. Data were analysed thematically using ATLAS.ti version 7 (www.atlasti.com) and principles of thematic analysis as laid out by Braun and Clarke (2006).

On completion of data collection and analysis in both phases, relevant findings will be interpreted and understood as a whole. For example, low rates of either exclusive breastfeeding, mixed feeding or formula feeding is likely to be supported by narrative evidence obtained during the qualitative study.

The design has several strengths including that it is easy to follow and is efficient and time-saving in that both types of data are collected during a single phase of data collection. The fact that the collection and analysis of the data is kept independent until the very end makes this design very well-suited to team based research.

The design however, is not without challenges. Excellent knowledge of both types of data collection is required prior to use of this design. In the example, researchers with excellent skill sets in both quantitative and qualitative research methods were selected. Natural scientists with experience in research involving breast milk and the biological determinants thereof were asked to investigate quantitative variables. While, social scientists with previous experience in conducting interviews with a similar population were responsible for the qualitative methods. Further, consideration of the different sample sizes and different sample characteristics should be taken into account before the data are merged and interpreted in the final steps. In this study, a sub-sample of women from the larger quantitative study were interviewed as part of the qualitative study.

In order to facilitate merging of the data, extra care should be taken to address similar concepts in both the qualitative and quantitative phases. In the above

example, quantitative information about women's levels of education and income were collected. The qualitative information gathered is likely to provide insights into the barriers to adhering to exclusive breastfeeding of which work related issues and income issues may contribute to not being able to adhere to these practices effectively. Contradictions from the data may arise due to the use of two different types of data collected. These contradictions should be viewed as new insights and thus strengths of this research. However, the contradictions may require additional data to be collected in order to resolve the discrepancies.

Example 2: Sequential mixed methods design (Roomaney, 2017) (Notation: QUAL→ QUANT)

In sequential mixed methods studies, one type of method precedes another in terms of timing. This means that either the qualitative component of the study is completed before commencement of the quantitative component, or vice versa. Sequential designs are used when one type of method builds on the results of the first method.

In this example, the researcher wanted to develop a psychometric tool that measures health-related quality of life[3] (HRQOL) in women with endometriosis[4]. In order to develop the measure, the researcher utilised an exploratory sequential design. As previously mentioned, this design consists of a qualitative phase followed by a quantitative phase (Creswell & Plano Clark, 2011). The qualitative phase lays the foundation for the quantitative phase. This design is commonly used to develop psychometric measures (Onwuegbuzie, Bustamante, & Nelson, 2010).

The aim of the qualitative phase was to gain an in-depth understanding of the impact of the illness on patients' HRQOL. In order to achieve this, the researcher conducted in-depth, qualitative interviews with 25 women diagnosed with endometriosis. The interviews were then transcribed and a qualitative method of

[3] The impact that an illness has on patients day-to-day functioning.

[4] Endometriosis is a chronic gynaecological illness that affects women of reproductive age. Symptoms include chronic pelvic pain, pain during menstruation, heavy menstrual bleeding and painful sexual intercourse.

analysis (thematic analysis) was used to analyse the interviews. The qualitative data management tool ATLAS.ti was used to manage the data during analysis. The codes from the thematic analysis were used to develop items (questions) for the HRQOL measure. The qualitative phase was conducted over the period of 14 months prior to the commencement of the quantitative phase. The qualitative phase is described in detail in Roomaney and Kagee's (2016) study.

The aim of the quantitative phase was to evaluate the psychometric properties of the measure. In order to achieve this, a battery of measures were administered to 203 women diagnosed with endometriosis. The battery of measures consisted of the newly developed HRQOL measure for patients with endometriosis and established HRQOL measure for patients with endometriosis, two generic measures of HRQOL and a measure used to screen for symptoms of depression. The quantitative data were analysed using the Statistical Package for the Social Sciences (SPSS). The researchers assessed the reliability of the measure by calculating its Cronbach's alpha. The validity of the measure was assessed by correlating the scores from participants on the newly developed endometriosis measure with the other quality of life measures and the depression screening measure. Finally, the factor structure of the new measure was assessed by conducting an exploratory factor analysis. The final outcome of the study was the development of a psychometrically sound HRQOL measure for patients with endometriosis. Figure 2 below summarises the methodology used in the study.

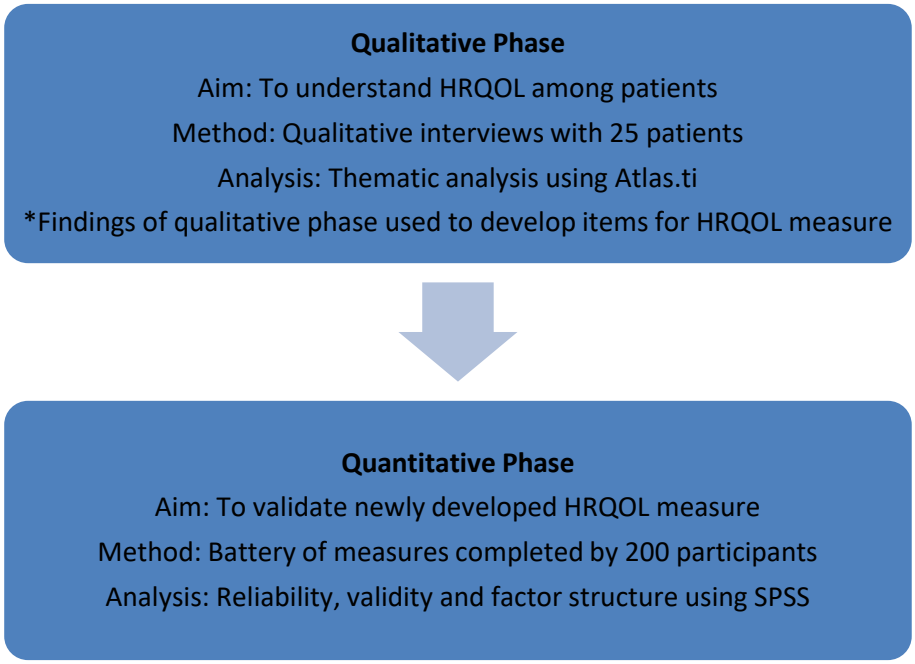

Figure 2. An overview of a sequential mixed methods design study

In the above example it is evident that the study used a sequential mixed methods design as the qualitative phase preceded the quantitative phase. The timing was therefore sequential. In terms of priority, neither phase was prioritised as both methods were regarded as equally important by the researcher. Finally the components were mixed because the quantitative component was built on the qualitative one.

WHAT DOES NOT CONSTITUTE MIXED METHODS?

This chapter has described what constitutes mixed methods but it is also important to note what mixed methods is not. Firstly, mixed methods is not content analysis (Creswell & Plano Clark, 2007). Content analysis is a method of data analysis that converts qualitative data to quantitative data (Wilson & MacLean, 2011) and therefore cannot be considered to be mixed methods. However, content analysis may be used as a method of analysis in a mixed methods study.

Secondly, mixed methods is not the use of either multiple qualitative or multiple quantitative research methods in a study. For example, a study consisting of in-

depth interviews and focus groups that are analysed using qualitative analytic techniques is not a mixed methods study as it does not contain a quantitative component.

Finally, it is essential that the qualitative and quantitative components of a mixed methods study be systematically combined. Mixed methods studies require an interaction between the qualitative and quantitative components. For example, the results of one component can be used to explain the other component. When the methods are not combined it is not regarded as mixed methods.

DISSEMINATION OF MIXED METHODS RESEARCH

The increasing interest in mixed methods research is evident in the development of the Journal of Mixed Methods Research (JMMR). This interdisciplinary journal was launched in 2007 and publishes theoretical, methodological and empirical articles regarding mixed methods. The formation of the Mixed Methods International Research Association also indicates the growing popularity of mixed methods. The association held their Inaugural conference in 2014.

Even though JMMR publishes mixed methods research, most mixed methods studies are not reported as mixed methods studies per se but instead their findings are usually reported via piecemeal publication (Stange, Crabtree, & Miller, 2006). Researchers may choose piecemeal publication because journals usually impose word count restrictions that prevent researchers from reporting on large studies. However, JMMR accepts research papers containing up to 10 000 words in order to accommodate the scope of mixed methods studies.

The writing of a mixed methods article is in keeping with the guidelines for mono-method articles. For example, articles should contain a sound, detailed methodology that is appropriate to the aims of the research. In addition, mixed method articles should describe the mixed method design, explain the rationale of employing mixed methods and detail where and how the mixing of methods was conducted (Leech & Onwuegbuzie, 2010; Mertens, 2011).

Stange, Crabtree and Miller (2006) offer alternatives to researchers who are unable to publish their findings in one report that will continue to make a contribution to the field of mixed methods research. These suggestions include publishing both qualitative and quantitative research in separate journals but clearly linking and referencing these articles to one another or publishing separate articles in the same journal. In order to advance the field of mixed methods, researchers should consider publishing their mixed methods studies as methodological papers.

ETHICAL CONSIDERATIONS

As mixed methods studies contain both qualitative and quantitative strands, researchers should be cognisant of the ethical considerations that are central to both qualitative and quantitative research. The over-riding principle of research ethics is that participants are not harmed. However, quantitative and qualitative research may operationalise ethics differently. For example, within quantitative research, the emphasis is on anonymity and protection and ethical management of collected data. In these studies, researchers may not need to know the names of participants, as they are one of many and the aim would be to generalise findings. The emphasis would be on maintaining anonymity of the data, ensuring that only researchers with permission are granted access to the data and that the original, captured data is safely stored. Qualitative research shares similar ethical considerations. However, given the more complex interaction between the participant and researcher, several more ethical considerations need to be taken into account. Firstly, in qualitative research it is crucial that researchers properly negotiate access to participants and that every effort is made to respect the participant and their environment, and to disclose the purposes of the research. Deception in research is an ethical transgression and ethics committees seldom allow covert observation. Secondly, researchers need to be cognisant of the effects they may have on participants during their interactions. Here it is important to establish proper referral strategies should participants become distressed. Thirdly, principles of autonomy, beneficence and justice are strictly adhered to and as such, participants need to make informed decisions about their participation and should not be harmed or exploited during the course of the

research. In qualitative research, every effort needs to be taken to conceal identifying characteristics of the person from whom data was collected. Researchers commonly use pseudonyms to protect participants' identities. Fourthly, in order to elicit rich data from participants, researchers need to maintain the highest level of respect for their participants in order to establish and maintain rapport. Rapport building is especially important should researchers seek to schedule follow-up visits with participants. Lastly, in the reporting of qualitative data, researchers need to be aware of their own subjective interpretations of the data and be sure to follow procedures for maintaining rigour in qualitative research. These ethical considerations should form a crucial part of the conceptualisation phase of mixed methods studies.

CONCLUSION

The purpose of this chapter was to introduce readers to mixed methods research, to contextualise mixed methods within ongoing debates, to provide an overview of commonly used mixed methods approaches, to provide detailed examples of mixed methods studies and to offer an approach to the writing up of mixed methods research. We conclude this chapter by advocating for mixed methods research as the best approach to answering complex research questions while retaining scientific rigour. Mixed methods, as a research paradigm, allows for the use of both qualitative and quantitative approaches to investigate complex social phenomena. The importance of mixed methods lies in the chosen research question, and finding the most appropriate way to answer it. Thereafter, the design of the research and the timing of the data collection phases follows as important considerations. Researchers and students that decide to adopt a mixed methods approach to their studies need to be mindful of this. Further, given that mixed methods combines two well-established paradigms, it is necessary that individuals with sufficient skills and knowledge of each are part of the research team. Given that this approach to research continues to evolve, it is imperative that researchers document their procedures carefully (and here we emphasise the importance of the interpretation of the findings elicited through mixed methods research), and share best practices.

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