**Scoping Review Methods for Producing Research Syntheses**

**Session 1:**

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[**Introduction to Scoping Reviews and Synthesizing Evidence**](http://ktdrr.org/training/workshops/scoping/session1/index.html)

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<https://www.youtube.com/watch?v=8aatSJsI0vY>

>> JOANN STARKS: Next I'd like to introduce our faculty for the workshop. Dr. Chad Nye and Dr. Oliver Wendt have worked with us over the years and in the past on training related to systematic reviews, single subject design, and research synthesis. Dr. Chad Nye is the former Executive Director of Center for Autism and Related Disabilities and professor at the University of Central Florida College of Health and Public Affairs. He has many years of experience in the area of meta-analysis and systematic review of intervention evidence including in the area of disability. He is an author of several systematic reviews and served as an editor and coordinator for the Campbell Collaboration Education-Coordinating Group.

We also have Dr. Oliver Wendt, who is an assistant professor in speech, language, and hearing sciences as well as special education at Purdue University. He teaches graduate courses on augmentative and alternative communication, Autism Spectrum Disorders, clinical research, evidence‑based practice, and single subject research methods. He is an author of systematic reviews and currently serves as co‑chair of the Campbell Collaborations Disability Subgroup. Again, I want to welcome everyone here and turn it over to our faculty to start the session. Thank you.

>> OLIVER WENDT: Thank you, Joann, for the introduction. This is Oliver Wendt from Purdue University. As you can hear from my accent I'm originally from Germany, so if during any part of the workshop my intelligibility is not that great, please feel free to shoot me a question in the chat section and I'll be happy to repeat and clarify what I'm trying to communicate here.

But anyway, let's get started. Here is an outline of what we are going to do for this session. Our purpose first is to give you a little bit of an overview on the entire landscape of systematic reviews. We will then talk about the role of the systematic review methodology for disability and rehabilitation research.

We will cover some of the major approaches to scoping reviews, talk a little bit about the major steps that are involved in the scoping review. And then we want to end in in the potential pitfalls, the pros and cons, some of the issues that we need to be aware about before considering the scoping review approach and this is covered under reflections under scoping review.

We did a little bit of a survey with everybody before getting on to the session today, and it turns out that most of you have either very little experience in research synthesis and mostly new to this task while others are already very experienced and have quite a lot of background and experience in meta-analysis and systematic reviews.

For the more experienced people, you may find that you are going to be familiar with some of these concepts, but you might benefit from the more in had depth reflections that are coming later, and please make sure that you come back for workshop number 2 where we are going really into more depth on the detailed elements of the scoping review methodology.

All right. Let's start with a little bit of an introduction to this entire field of research synthesis. So over the last decades, there has been a growing need, a continuously growing need for more methods for better ways of reviewing various types of research evidence. There have been the classical models of the systematic review and meta‑analysis, but these can often be very work intense, and that can be a burden. The burden may in return limit the scope of what can be covered.

So in order to meet a larger variety of user needs, different variations off‑shoot, off source classical models of the systematic review of meta-analysis have been developed.

While we are going to go through some of them today, it is important to understand that some of these methodologies are much more developed and they are currently being conducted very vigorously while others are still in its infancy and they are less mature in the fine line between differentiating the different subtitles.

For us as researchers, the challenge is to determine the unique contribution, contributions of each of these methodologies and to make a well‑informed position, what should we use for which scenario of research synthesis.

All right. Here is an overview about the major types of approaches, how it's conducting a research synthesis, how it's conducting a literature review.

One of our colleagues in Canada, Bob Bernard actually did an overview paper and found over 40 different ways of doing literature synthesis. The six methods that I'm going to be commenting on briefly here are just the major approaches that are currently out there.

All right. I want to start with the narrative review. Very early on the traditional way of reviewing the literature, the research literature, used to be the so-called narrative review. In a narrative review, we only typically had one reviewer who would gather and interpret the literature in a given field because that person was deciding by his or her own standards what to include and what not to include. This often resulted in a very biased sample of the full range of literature on a given subject.

The reasons for including some studies and not excluding ‑‑ or excluding others were often not very explicit and were then reflecting the bias of the author.

The literature search included, inherent in such a narrative review, was often not very explicit and could not be replicated. In some there is not a whole lot of transparency and rigor in conducting the traditional narrative review. Relevant studies can easily be excluded from the review process, and that results in the potential selection and publication bias. There is also no quality assessment in a narrative review. Quality assessment meaning once we gather all study reports, some are going to be of low quality and others are going to be of higher quality. Typically in the review arena, there is this idea, we want to give more weight to the higher quality studies, but that urges the review team or reviewers to make a better differentiation between the methodological sound and unsound studies.

In a narrative review this is typically not done and all the studies are treated and described equally.

A step upward from the narrative review is a relatively new concept that is called an evidence map. In an evidence map the goal is to identify all relevant literature within a research field. The researches try to come up with a comprehensive assessment of what is known and they want to identify where the research gaps exist.

The research question for the evidence map is more explicit. It may vary in depth and ideally it should be informed by end users meaning by those consumers of the treatment that would be benefit from the concepts or interventions or treatments that are under investigation here. The search strategy is more explicit as in a narrative review. It should be (thorough?), it should be made reproducible. The evidence map, however, stops at that point where all the literature is gathered. It puts that literature together in a graph or in a table‑type of format. It does not go into more depth in terms of describing or interpreting that entire body of literature. It just puts out there what does exist and where are the gaps.

Important to understand, this concept is very early in its development. There is no consensus about review methodologies yet on how exactly is this going to go on further, what exactly constitutes evidence‑mapping methodology.

I will show you an example. This is an evidence map of acupuncture for pain. The primary question at hand is what is known about the use of acupuncture for pain management? So the researchers gathered all available literature that does deal with acupuncture use for different types of pain management. So the circles are representing the size of the ‑‑ the size of the circle here on that graph represents how much literature exists, so we can see for managing knee pain, there is a lot of use of the acupuncture method. There is much less use for fibromyalgia or for mental health, a little bit of use for headache, some for rheumatic disorders and insomnia. The researchers went as far as calculating the effect size, calculating an estimate of the magnitude of treatment effect here and they are grouping the studies accordingly. The ones that show a better magnitude of treatment effect are more pushed toward the right and the ones that don't have as much of an effect size are more grouped toward the left.

Then there is also a little element of a quality assessment in here in terms that the strength of the evidence is measured along the Y-axis. There is a scale from 1 to 5. The studies that receive a higher rating in terms of their quality assessment are ranking more toward the top. And the ones that are lower in quality more toward the bottom.

This is a very advanced and very rigorous example of an evidence map. Most evidence maps do not go this far. They do not include a quality assessment neither do they include an effect size calculation. They would most often come to you as just a more tabular format of listing, this is all the literature that exists in had the given field for some type of question.

Okay. Moving on. And the gold standard in the review field traditionally has been the so-called systematic review. It's a type of quantitative review. By a systematic review, we mean the application of procedures that in the end will limit bias in the assembly in the appraisal and synthesis of all the relevant studies on a particular topic.

We can go as far as running statistics on the ‑‑ like in the example on the size of the treatment effect and aggregate all the studies by their effect sizes. If we are engaging in that process, we would be calling that a meta-analysis. So a meta-analysis is a step upward on the systematic review. Not all systematic reviews, however, do engage in that statistical process and are considered a meta-analysis.

We are talking about a meta-analysis only in that case of a statistical analysis where there is a larger collection of results from individual studies and they are statistically aggregated and synthesized.

This is like I said, currently the gold standard, adopted by many fields to document evidence‑based practices, document what is known about the efficacy of interventions and treatments. It is not limited just to treatments. You could also do a systematic review or meta-analysis to dive further into the accuracy of a diagnostic tool, for example, and compare different assessments or diagnostic procedures.

So not all research is quantitative in nature. There is an increasing amount of qualitative research even in the health care field. Some examples for qualitative research could include studies that are a phenomenology, studies that are ethnography, case studies, grounded theory, all of these types of research address questions outside of our common realm of quantitative treatment efficacy. These studies might be dealing with the experiences of patients, the perspective of stakeholder, environment, knowledge and views, patient value, certain barriers and challenges, so a lot of secondary topics that are not directly about intervention or treatment efficacy, but they are still informative about how well does the treatment work, what are the experiences of the end consumers and so forth.

And over in recent years, we have seen a trend for these studies to be aggregated and synthesized as well. And such a synthesis of qualitative research is consequently called a qualitative review.

In other words, the synthesis of individual qualitative research reports related to a topic to arrive a new understanding, basically you walk through the same process as you do with the quantitative systematic review, but now you are applying the same principles to the qualitative research. You can, of course, not do a statistical analysis. There are no such data reported to such an extent that this would be meaningful.

KTDRR last year did an entire series of workshops on qualitative reviews if there are people in the audience that would want to know more about this. I encourage you to go back to the KTDRR website and locate that series of workshops on reviewing and synthesizing qualitative evidence.

But let's move on in our overview here on the landscape. The next type of review attempt or review effort I want to talk about is the rapid evidence review. This is sort of like a full systematic review but more like a quick and dirty version. It's a modified full systematic review. The primary difference to the full systematic review is that the information retrieval and analysis of data are abbreviated to speed up the review production.

The primary goal is we just want to locate the most recent and most recognizable studies, the best and most recent evidence out there to get like a quick overview of what is currently happening in the field, capturing the most evidence in the shortest time.

Often times these rapid evidence reviews are being conducted to inform stakeholders, to inform policymakers, giving them a quick update, and this is then being done by preparing summaries for dissemination. The conclusions are often presented as more tentative, and there is a potential general estimate of effect that's not considered final unless a full fleshed out systematic review is being done.

The focus summary could be a major methodology and policy‑related issues on a given topic.

Okay. And then we're coming to today's focus. Today's review type of interest, the so-called scoping review. The scoping review is a narrative summary version that is designed to provide an overview of an evidentiary base in a field on a topic. It's much broader. Much more comprehensive than a systematic review. The entire process, however, can be systematic. Often times scoping reviews are being done to assess the breadth of a research literature and then there is an attempt to map that literature base to where are the primary sources, where are those study reports are coming from, who are the primary scholars in the topical area, or what are contemporary issues that this body of literature is currently dealing with.

One of the major priorities for scoping review is then, again, to identify gaps and pose questions that are needing answers in a given field of interest or research.

Here is a little bit of a comparison, the systemic versus the scoping review. I'm going to start on the left‑hand side. On the research question, the systematic review is very focused, very narrow parameters. We are specifying exactly the type of intervention we are interested in, for what population we often specify the outcomes as well. In the scoping review, we are keeping it much more broader. We are just describing a more general context, maybe an intervention or a type of intervention that we're interested in, but then we're leaving it open to conduct this very broad, very exhaustive search on the literature base.

In the systematic review, the inclusion and exclusion criteria are usually defined at outset, very precisely defined for maximum replicability. In the scoping review, there will be some initial exclusion and inclusion criteria, but they might develop over time. As the researches are looking at more and more resources, are becoming aware where the major outlets are located, that they might revise their inclusion and exclusion criteria as they keep on going.

In a systematic review application of quality filters is often very important, especially if the focus is on treatment efficacy and you want to review the higher quality studies or give more weight to higher quality studies, you would do a very sound quality assessment.

In the scoping review, quality is not an initial priority. The attempt here is just to understand everything that's out there. See the larger picture of all the different types of evidence and resources that exist for a given topic.

Good. In a systematic review, I'm starting again on the left‑hand side here. There is a detailed data extraction process, you often have a protocol you're following and coding manual. There is reliability conducted on the coding process. In the scoping review, depending on how in depth it's going to be, it may or may not involve a lot of data extraction. If there is a sub question to that broader topic at hand, they might do some data extraction but it may or may not be the case.

The systematic review can come along with some statistical analysis if we are putting on the quantitative synthesis, you might call it meta-analysis, that is not typically being done in the scoping review side. The synthesis stays at a more narrative level. Later on we will see how this is being done in some examples. There is not a quantitative aggregation of results. Things are more narratively described, put into words, put into tables that are being presented to the audience.

The systematic review includes a quality assessment. It ends in a very rigorous conclusion to a focused research question. The scoping review, again, stays a little bit more vague, stays a little bit broader, and just end in identifying parameters, such as what are the major sources where the evidence is coming from and what years has it been published and what languages is it published, by what authors, in what journals and so forth. What questions have been tackled with, and what have not been tackled, what outcomes have been targeted and what are maybe outcomes that have not been targeted yet. So these more overview questions are then the bottom line, the answers to those other bottom line in the scoping review.

Dijkers, who is a frequent presenter here on KTDRR workshops came up with a possible ordering of knowledge synthesis methodology, kind of ordering them by the degree of rigor and transparency, and it starts with the narrative review as the least transparent variation here. A review of the literature that is unsystematically searched and minimally extracted to answer the broad question that may be vaguely stated, and then a step upward is the evidence mapping, it ends on a more explicit question, a more systematic search for literature and tabular summaries at the end where the findings are presented in a systematic way.

And the scoping review is then one more step upward from the evidence mapping because it doesn't get stuck at the level of only putting things into tables. It makes an attempt toward a description and interpretation of the results, what do those tables mean, now we found all these study, what can we devise from that? What are the gaps in the literature? What are the questions that still need be answered? This is where the scoping review goes.

Then we have the quantitative systematic review or the qualitative systematic review, and they are really much more rigorous, much more transparent, even more systematic in the way they are structured and being performed and implemented. They try to rigorously implement all the critical elements of a systematic literature reviewing and integration approach.

And then at the very top here, number five, the meta-analysis which adds on a more quantitative synthesis of the evidence‑based on statistical pooling on the findings of the studies that were selected.

All right. I think that was my part. I'm handing it over to Chad to talk a little bit about more how can such a scoping review methodology inform researchers in the disability and rehabilitation arena.

>> CHAD NYE: Thanks a lot, Oliver. Let me start mine by putting a little historical note to this. Back in the olden days, about the year 2000 or so. We viewed scoping reviews as something less than systematic. They were generally presented as narrative reviews that had sort of been upscaled, upgraded, if you please.

The development of a scoping review over the last, oh, 10 years, anyway since the O'Mally study in 2005 really moved the scoping process procedure into a systematic review framework, which I think is a real benefit to those who are interested in summarizing the literature and research.

So scoping review is maybe best viewed as more than some kind of a system of narrative summary. It really has a systematic process and procedure to it.

So with that, let's take a look at the value of a scoping review. How can a scoping review really inform our research? Well, first of all, the scoping review gives us this organized summary of existing research. That organized summary part is of value to quite a few people, actually. And it's the organized part that makes the scoping review really useful. It brings together the knowledge base in one place, if you please, on a given subject or a topic.

It also gives us a basis for dissemination of methods, findings, conclusions, a way of looking at the broad base of the literature and making some decisions, if you please, about what we do or don't know, which leads to identifying gaps in the research or areas of need and so forth.

Certainly in the review literature there are examples where reviews have resulted in grant applications, grant funding, dissertations produced, et cetera, that would add to the knowledge base.

It also informs us in terms of the breadth and depth of the issues that face a field. There is kind of two ways of measures, if you please, of understanding existing research. There is this vertical ‑‑ or this horizontal dimension which is the breadth of knowledge that is available to us. And the scoping review focuses on that.

The other way to think about it is vertical, and that is the depth of it. Scoping reviews, by nature, are not designed to be deep. They're not taking a single topic, a narrow topic, and drilling down into the details of all that are found on a single subject. Scoping reviews are looking at the big picture. What do we know in general and in reference to the subject matter as a whole as opposed to a single question or issue?

It also guides us in policy issues. It helps to develop understanding of how we apply the research. Certainly the more information we have available, at least in principle, the more appropriate policies can be articulated that would address the issue. And the question arises is to what extent does really useful policy, is that affected by the data, so to speak.

And the scoping review gives us a starting point for that discussion. To say, here is where we need to spend resources and maybe even points out the areas where we don't need to spend resources because there is a fair amount of high‑quality research available in that area currently.

And it can provide a basis for a full systematic review. Particularly if it's a subject area for which there hasn't been a summary function of literature evaluations that would lead us to a better understanding of topics and issues.

And lastly, it helps us refine the nature of specific issues. It points out within a given topic, a topical area, it points out issues that may be lost because there is, there is so much within the field that gets lost because of the very volume that exists in a given area.

There is a consumer audience for this. And there are multiple folks. And I've listed new and senior researchers at the top in part because that's my bias. A good scoping review helps me to understand the nature of a topic of a given area. So it's not just an upgraded term paper, as I have called it in the past very sarcastically, which is not appropriate.

A good scoping review really does give us insight into the nature of the research in an area and the needs for future research in an area. I would think that for graduate and undergraduate students, particularly those in training, scoping reviews are excellent ways to orient one to a given topic and to the issues and concerns within a given area.

It also is good for clinicians looking for some kind of evidence to support their activities in the clinical world. Not that it becomes the answer, but it at least can stimulate the thinking toward alternatives when certain clinical events aren't having the desired effect.

And last but certainly not least in this is the consumer, the patient. One of the events of my career that was really most, I don't know how to say, enlightening was centered around consumers and the information in a review. And I was at a ‑‑ I was in a meeting. I was in the Cochrane Collaboration, but in a group preparing to do systematic review many years ago. And in that group were physicians, several physicians who were engaged with evidence‑based practice through the Cochrane Collaboration. And the single biggest concern voiced at that time, I don't think that would necessarily be the case today, but it was then, was what would the consumers do with the evidence? Do they run a copy off of the reports and bring it into my office and ask me why it is I'm not doing the thing that the evidence is most pointing to? The question really was focused on the competency of the practice.

The consumers have use for this, and they do use it to guide decisions about what they will be involved with in terms of interventions. Scoping reviews at least have the possibility of being a guide for consumers about issues in any number of areas that we would be concerned with in rehabilitation.

Some strengths of the scoping review in general, some of which we've already covered, so I won't rehash those over again. But certainly the idea of gaps in the research and knowledge is a major issue. It gives us a starting point, not only for sources, the size of the literature, the questions, the issues, what has been tried. And in some cases, what has not worked well and in others, what has worked very well. Often in a smaller scale. One or two studies. I'm always interested in that study, that single study that shows a result that's pretty phenomenal.

My question is usually, if that's true, can that be replicated? And why is it that out of a group of studies only ones showing a significant and positive effect. So the scoping review gives me a place to look at that and begin to analyze the potential explanations for that and thereby guide my thinking about additional research in an area.

One of the issues that probably gets the most attention in scoping review is that it tends to be less intensive in resource demands. That's a euphemism for; it doesn't take nearly as long. I think it's fair to say, that as you read the literature in the last five years at least, that that's becoming recognized as while it may be less than a systematic review, a full systematic review, it's still labor intensive and there is still a resource demand there that is in some cases is more than you might anticipate for doing a quote unquote scoping methodology.

Sometimes terms, terminology becomes a real value or strength for scoping reviews. A good search may well identify a number of different terms that are all focused on the same intervention, same issues, same topics, or at least similar enough to be conceptually related. And it broadens sort of the scope of what we recognize for being included as part of a literature base.

Identifying documents. One of the issues in a review in general is what's the, what's the guideline? What's the parameters for information on a topic? And a good scoping review may well identify documents such as unpublished papers or grant, grant activities, or directives that people have used in implementing policies based on existing evidence that is often not part of a more focused, rigorous systematic review process. So it has some real strength for us in terms of just enlarging our view of what we're interested in, what topical information we're interested in.

It has some weaknesses. Scoping studies are generally viewed as a rapid response, and here interestingly enough, if you look at the number of the studies that have been produced even within the last three years, I've found instances where the authors have referred to a scoping review as a rapid review.

It's not the same as a rapid review. Scoping reviews are not intended to deal with the quantitative summary as in analysis that would be particulate of a rapid review. Rapid response is usually what's reflected to represent resources, time, researcher resources.

So the idea is that it takes less time to get an answer. The problem is, the focus can be wide and shallow and not really support, if you please, what works kind of things. Especially if that's the kind of topical areas you're looking for where it's a matter of trying to identify the efficacy of interventions.

It can result in a limited or unsystematic review. I think that ‑‑ my sense of it over the last several years is that that's becoming less and less of an issue. As we get better at defining the question and retrieving the literature that is reflective of that question, I think we're seeing, at least I'm seeing in the literature what looks to me to be much less unsystematic. So that weakness may be one of sort of decreasing emphasis in the whole area.

The one thing that does seem to me to be an issue, and I'm going to talk more about this when we get down toward the end of the session here, but scoping reviews don't typically appraise evidence quality. Methodological quality, if you please, of the study. One of the hallmarks of a systematic review is that there is a prioritizing of quality of evidence to determine or to justify the emphasis, the strength of evidence. And that hasn't typically been the case with scoping reviews.

Having said that, that also is in transition, and we'll have a little bit more to say about that in a bit, but that at least has been the general intent in terms of evidence in the past. It doesn't synthesize results. So we're not really dealing with the numerical part. As Anderson and company have said, scoping reviews are indicative and suggestive rather than definitive and prescriptive. I think in general that's a good summary of what a review is. The fact that it is definitive and prescriptive does not necessarily make it any less viable, useful, or important of a process, but it does give it a meaning or definition of what it's about or what its real role is.

So with that in mind, I'd like to show you an example from a scoping review. I just chose one that I thought was fairly typical of scoping reviews. There are more and more of these being published regularly, and they are certainly of a quality that make it a worthwhile enterprise, to say the least.

This one has to do with workplace accommodations for people with mental illness. Identified as a scoping review. I guess my first observation here is in this title, they call it a scoping review, and it is. I have other studies in my file that call it a scoping review and it's more like a rapid review. Or a rapid review that's more like a scoping review. So at least in terms of the methodology that is being used, I think it really represents what we're talking about with scoping reviews.

The purpose statement is an important focus. It tells us kind of what the parameters are. And in this case, they were looking at types and frequencies of workplace accommodations for employees with mental illness. And then as sort of a tag, associated costs and outcomes.

So this is not looking at other areas that might well be related to workplace accommodations. They're looking at types and frequencies. And their summary, if you please, of the literature is focused on that, on those things.

The methodology that was used is fairly typical. They searched five databases. Interestingly, it was CINAHL PsychINFO, Medline and Embase, and the Cochrane library. Some would argue there has to be more than five databases that have peer review articles. This is one of those issues that the reviewer decides and has justification for. In the case of a scoping review, this may well be the sources that really will generate the vast majority of the studies that are available on this topic.

So the fact that there is 5 or only 5 as opposed to 27 may reflect where the evidence lies. If that's the case that certainly gives us a much more focused view of the place to go looking for the literature. They excluded opinion paper, reports case descriptions. They had criteria for what was to be included and what was to be excluded.

The included studies were quantitative and qualitative, and I think we're going to see more and more of this kind of thing both in scoping reviews and in other kinds of systematic reviews where the two areas that are kind of at odds almost at times are going to be supportive of evidence in the studies available. But these were their criteria for inclusion.

Okay, the findings. The findings of the study fall into a couple of categories. One is, what was the evidence? Where was it? How much was it? How broad was the database? They identified 39 articles. That wasn't all that they found. That was what they found that met the inclusion exclusion criteria. In this case, they didn't go into any detail about how many articles they identified in the literature search to get to the 39. Often we'll find there will be thousands of articles. I have some other examples of data that we'll look at in the next workshop where they identified nearly 4,000 articles to end up with just a handful of 25 articles. 39 is a good number. It's a broad number. She excluded 6, gave us their opinions. 7 were excluded because the participant issues. And others because of not focusing on their topic. The result was they got 10 studies that met their criteria for including in the review itself.

And in those 10 studies, 6 of them were from the USA and then 1 each from Canada and Sweden. Now, I also included this one because 10 studies is reported in one place and in the findings section it was down to 9 studies. I couldn't find where we lost the one study. So I know there is a UK, Canada, Sweden, and Netherlands here. That's the 10. But somewhere down the line we've lost the count on a study. I'll chalk it up to my inability to identify the mathematical skills in this as opposed to the author, but nonetheless.

The focus had 4 studies that had supported employment, and two in occupational rehab and three in combinations of accommodation. So how did they summarize the data? How did they extract whatever information from this that they wanted in this scoping process that summarizes what they found from these 10 studies?

They categorized them by 3 categories, types and frequencies, the need for provision and workplace accommodations, and the third one was outcomes and costs of workplace accommodations.

They identified that supported employment workers were, were important for improved or for the types of accommodations that occurred. They were important during hiring, on the job support. They were facilitative of communication skills and so forth. Workplace adjustments were things like scheduling hours, job training or description, physical accommodations and so forth. Those were points that were consistently identified across the studies. They're summarizing 9 or 10 studies here into 2 or 3 statements.

In terms for the need of provision of workplaces, mentally ill got significantly less likely to receive accommodation, particularly if there was alcohol or drug abuse and depression associated with that. More limitations one have the more accommodations that tended to be made. That could be in terms of support from within the employment itself or from the support employment worker or the co‑worker.

In the outcomes part, interestingly I thought anyway, most of the accommodations that improved job tenure. That is for those who disclosed, there is less accommodations and shorter tenure than for those who didn't disclose. Relationship ‑‑ an issue that is often, at least in my experience with individuals with Autism, that's an issue that is problematic in a lot of employment situations.

The cost part of it was interesting. That indirect costs were measured in these study, but none of the direct costs had major effect. That is it didn't cost a whole lot more to make these accommodations for the individuals.

I showed this example to you also to say, this is how the data are presented. Strictly narrative here. You don't see anything that relates to significant statements or statistical analyses.

And conclusions, how they summarize it, we were talking about the narrative aspects of a systematic or of scoping reviews and this is how they're presented. One of the sort of criticisms, if you please, of the narrative issue is how do you keep all of these facets of multiple studies in mind? Well, you organize the data according to topics, subjects, findings that are common across a study. And these are a couple that I pulled from the article itself.

Limitations, fairly simple. No discussion here about sample sizes, studies that had larger samples, studies are randomized trials if there were any. The limitations were most of the studies fell into one of these three issues, categories of concern here across the studies.

Okay. So with that I'm going to turn it back to Oliver and we'll do a little overview here of the major steps of a scoping review as a kind of a foretaste or a quick summary of what we will go into in depth when we come back in a month for the second session. So Oliver?

>> OLIVER WENDT: Yep, thank you Chad. So how would one actually conduct a scoping review? There is a 5 to 6 stage framework from identifying the research question over literature search selecting, charting studies, then reporting the results and optionally consulting with the stakeholders. The first step would be to identify a clear research question by scoping reviews can be useful in helping to plan a systematic review and outline the research gap; they themselves also need to be guided by their own clearly defined question. The review team would put in a guide and direct the development of the specific inclusion criteria. You want to have as much clarity as possible in that review question because that will later on guide your protocol, your literature search, you will have a better structure for the development of the entire scoping review report.

At a minimum, you would want to consider three major elements, the larger background of context of your review question, like pain management in that evidence map, for example.

The population, roughly who was effected, who does experience pain and who would be in need for pain management, and then the larger concept, they're calling it concept because you don't have to limit yourself to just one type of intervention or treatment. You might just stick with an overarching team such as pain management and within that overarching theme, ask sub-questions such as what are the different sub-treatments in individual interventions for pain management like in that previous example, there was acupuncture, you could ask for traditional Chinese medicine or other alternative forms or regular forms of pain management techniques.

So keeping it vague and comprehensive while still having some guidance here in terms of context, population, and concept is the key to having a proper question for a scoping review.

Once that question is clear, the literature search is next. In a scoping review the literature search is super comprehensive, even more comprehensive than in the systematic review. All published and unpublished literature including gray literature, such as doctoral/master’s theses, grant review reports, are being investigated are being searched for. Having a good search strategy is key. Having a search strategy that is sensitive to all of these different types of resources.

And over the course of that scoping review endeavor, the search strategy could be, could be tweaked because the team might find, okay, we need to insert some further key words to really capture everything that's out there.

Current standards such as the ones by the Johanna Briggs Institute would recommend you have at least two reviewers to do a scoping review. Going back to what might be a good research question, I wanted to mention a topic here, neurological reactions to the human papillomavirus, a scoping review, that's a typical title for a scoping review, often times the title already indicates at its very end that this is not a systematic review, but this initial overview that we call the scoping approach.

All right. Study selection, in having some, at least some vaguely developed inclusion criteria, that would be good. That forms the basis on which the sources will be considered for inclusion, should be clearly defined. Again, we're shooting for at least some degree of transparency and replicability. Again, at a minimum for those inclusion criteria, the review team would consider what population or populations are we aiming for, what concepts are we interested in, meaning could be several interventions under a larger theme, but outcomes might be targeted or might play a role in this larger concept. What is the entire context and background for the literature body of interest.

As far as types of sources can go, we really can include any existing literature ranging from the gray literature, the unpublished thesis over some newsletter report to the more fleshed out and focused research article.

When it comes to presenting the data, often this is done in charts and in tables. The data extraction process would be guided, again, by the research questions that were originally being asked. Then the authors chart a table, presents things in a tabular format. They might go by some criteria such as author, year of publications, study locations, types of intervention, types of populations being studied. Again, presenting it more in a spreadsheet or database format to give this systematic overview about the research, research base, the entire research arena.

While they are doing that, they might want to identify commonalities, themes, and gaps in the literature. And these commonality themes and gaps are then written up in a summary report that goes on top of that map, on top of that table. The elements that are earlier being identified in that topic, in that research question might be useful to present and to comment on those findings on those results. They can guide that chart, that table. Often times the research team and the scoping review, they start out with an initial chart or table and then they're refining this as they go, as they process, and finding more literature along the way, they can still insert that into the chart or table.

In the original literature, there is a recommendation to consult with stakeholders on top of the actual review process. In practice I have never seen that, that a scoping review actually involved a part about asking stakeholders, but this is an optional step that exists, so you should know about this.

The idea here is that a scoping review can be enhanced, can be made better if consumers and practitioners also contribute to the work, are involved somehow in some capacity in the review effort. These consultant, these end consumers might know some references that you as a reviewer don't know. They might comment on some services that are available that exist that you're not aware of, and just getting their ideas, their feedback on the types of interventions or issues or concepts you're interested in can add additional value.

So the bottom line, the idea is on top of the review process, we're adding an element of social validation of asking the end‑consumers and stakeholders directly what their views are, and that also helps in identifying some urgent literature gaps, some urgent questions that need to be answered.

Okay. That was my little part here. I'm turning it back to Chad to reflect a little bit more critically on the entire scoping review approach.

>> CHAD NYE: Okay. Reflections is more reflecting some thoughts I had about this than it is sort of an evaluation, if you please, of the material here.

There are ways, several ways that I find literature and scoping reviews are organized. The presentation, if I remember, we said this summary, if you please, is a narrative format. That is, you don't find any growth curves or multivariate analyses that are part of the results. They may report that, but there’s not these calculations that would go on, as would be typical in at least some of the primary studies. So there is at least, there’s three here. The fourth one is my own observations, so let me just point to three.

Treatment of outcome variable, independent variable, and topical summary is the classification, if you please, that I've given to the ways that most often ‑‑ I'm not suggesting there are no other organizational, types of organization for scoping reviews, but these are ones that are fairly common. And so I want to kind of run through them and show you a quick example of each.

This study was Career‑led health interventions to monitor and improve the health of adults with intellectual disabilities in the community, colon, a systematic review. Well, it was systematic, scoping. If you simply read the title, you might think you were getting a full-fledged systematic review. It's a well‑done scoping review though.

These are the outcomes that they identified as part of the procedure, the purpose of the study, and the numbers of studies that they identified are found, that fell into these category, if you please.

This is that treatment outcome variable. Here is what the summary looked like for these studies. A number of them. I'll have to let you take a look at that for a second. Notice in this, again, that it is a narrative description. They had, they had examples of randomized trials and of single groups, and those are reported but they're not analyzed in a statistical fashion that we would find in a meta-analysis, synthesis sort of thing. Basically pointing to individual studies and the similarities or commonalities that are reflected in the studies under those treatment outcome variables or categories.

So okay. A second, another one would be independent variables. Drager and company were involved in a study that looks at the synthesized speech output for children, and they used dependent variables as their organizing principle or categories here, ones that are of interest to us to say the least, if not important to assessing how effective synthesized speech functions here.

So these were related to stimuli variable, and variables related to listener. They gave us some categories. These are the five that they identified across the studies. They have a total of, I lost the number here now, just how much studies there were. Oh, 10 studies. These were the 5 categories across the 10 studies that they've identified. And here's what their summary looked like. Even less presentation of statistical information.

Drawing conclusions about, in the case of age, that there is just not much evidence that the age of a listener has an impact. That in terms of comprehension there are questions about how well that works. Independent variable. In both of these instances though, what you're see something a narrative summary, and the degree to which that narration reflects the findings of the study, of the studies that were included is what we're left with to work for or work toward in terms of either identifying gaps in the research, areas that we might enlarge upon, or direct policy or even clinical practice.

Topical summary, this is where there is a categorical organization, determined by the author. It's really an overview. It's sort of a mapping function, not in the way that Oliver presented earlier. Not easterly in that kind of detail, but a mapping function in a sense that where does, where does all of that sort of lead us.

They may refer to quantitative finding, but they're seldom judging the quality of the evidence. And in this case, that's exactly what happened. This has to do with family wellbeing. These were the key findings. Outcomes were key findings, in that they call predictor of family wellbeing. This was family well-being of individuals with Autism spectrum disorder, a scoping review. So these were topical categories that sort of, if you think of it as after the fact, that is they had the studies in hand. They organized the studies, and this is the way that the results, the findings of those studies made the most use of the data that was presented.

So here is how that narrative presentation excerpt. These often, these often give us the, some of the terminology that we need or the topical needs, I guess is a way of saying it, for what is understood in a given area and where we need more investigation. Most all of the scoping reviews that I have read recently, all of them say we need more research. So the question in part is, where can that research ‑‑ where can we best put our time and efforts to address that research?

So the last topic here before we close up here has to do with the quality of evidence. So I want to at least be transparent to the fact of, this is a personal bias. If you agree with me it’s Chad, if you disagree it's Oliver. Quality of evidence is not a consensus issue within scoping reviews. Some writers say the quality of evidence is not part of a scoping review, the purpose is a broad‑base presentation of all evidence. I'd like to suggest to you that at least there is an inconsistent application of that in this scoping literature. There are some reviews that you will find, they do make statements of what studies ‑‑ or they do conduct quality assessments of studies. They classify studies by randomized trials, by quasi experimental, by single group, by correlational studies and so forth.

It seems to me that included studies could certainly be organized as a subset for review that would be presented as a way of summarizing the evidentiary base.

The process for that, for conducting that assessment exists. There are several systems that can be used to give judgments of quality. Now the advantage to that, it seems to me, is that at least from the reader, it provides us with a much more useful way of organizing evidence that may really be where ­-what we're interested in. If it is qualitative, then the nature of qualitative research is very different from that of quantitative research. And so depending on what the purpose is, whether it's going to be, do I want to address issues of efficacy or do I want to address issues of perception of a psychological nature.

So my sort of, it's not a beef here, but my point to this is that I think scoping reviews can include assessments of quality of evidence of the included studies and not detract from the mission of a scoping review. In fact, I'd argue it adds to it.

So in conclusion here for us, why do we need a scoping review? Well, it's a good way for giving us an overview of the state of knowledge. It's an appropriate measure for broad questions, and at least for some of us, that broad question is a really important and useful way for us to understand the context of the particular areas that we are interested in.

The goal is to include all of the relevant literature to the question, to try to minimize that bias of selection and inclusion. Quality of evidence is not a primary consideration, but it could be. And there is something to be said for limitation of resources being a good, this being a good choice for it. It doesn't require the kind of investment that a full‑blown systematic review would.

I would argue the last point though is, that's the critical one. And it is this. The scoping review that's done in a systematic way, that has a systematic methodology is transparent, replicable, and documentable. And those three buzzwords in the family of systematic review, those are the ways that we sort of enlighten, if you please, our peers, our colleagues. We add to the knowledge base of how we collect, organize, evaluate, and report findings and results, that those three terms that are applied to the quantitative systematic review are appropriately applied here for scoping reviews.

So with that, I think we are, we are done. We have here for our - is it May 25th? Do I have the right day? Yeah. That session. A couple of readings that we thought if you, to come back, a little advanced reading would be helpful.

The second one, the Johanna Briggs Institute is the manual that they have developed for scoping reviews. It's a very well presented tool for how to do scoping reviews, and we're going to go through some of the details that are in there as well.

The first one is the example from one of the ‑‑ or is a study from some of the examples that I just presented that I thoughts with a particularly good example of a scoping review. So I'm going to leave that with you.

If you have questions along the way, feel free at least to contact us. We would be happy to talk to you. And with that, I will turn it back to Joann.

>> JOANN STARKS: Thank you very much Chad and Oliver. We do have some time left for some questions, so please ask your questions in the chat box, or if you prefer, you could send by email to ktwebcasts@air.org. Also, if you think of questions later you can send them to this address or you may contact Dr. Nye and Dr. Wendt directly. Their addresses are found on one of the last couple of slides.

So let's see if we have a question here from - Wendy is asking if we can show the slide with the resources again. Yeah. Okay. That's the one we have up right now. We have a question from Susan Lins: is evidence summary the same or different from a scoping review? So I'll let you take this Chad or Oliver.

>> CHAD NYE: It's the same in a sense that the evidence summary is the synthesis of what is known about a topic. There are different kinds of summaries, and the hierarchy that Oliver gave you early on is kind of the benchmark, I guess for that. The narrative review being sort of the least ‑‑ or potentially the most, how do I want to say, biased. Could introduce the greatest bias. And at least in principle, the full blown systematic review would result in the least bias of data collection summary and analysis. But the short answer to your question, I would say is, yes. It is a kind of ‑‑ scoping review is a kind of evidence summary. Oliver, you can correct me there if you want.

>> OLIVER WENDT: To challenge here is that there are a lot of terms floating around. Sometimes they mean the same type of products, other times they mean different types of products. As an overarching category I would say I agree with you that the scoping review is a type of evidence summary. Sometimes you see the title “Evidence Summary” floating around there, and it really means that more rapid evidence review, where there is just a brief summary of the most recent high‑quality evidence to just kind of document the latest status in the field. So you'd have to be, you have to be careful when you see these labels. You want to always look a little bit deeper, what has actually been done there, what has been covered, what was the purpose of that type of review.

>> JOANN STARKS: Thank you. We have a question from Steven. When trying to limit the number of studies included in a review, is it more rigorous to have more defined inclusion criteria or more broad exclusion criteria or both depending on the review?

>> CHAD NYE: Well Oliver, if you're not going to talk, I will. Yeah. It depends on the question. I mean, the purpose of scoping review is broad. I say it's wide and not deep. Part of that is exactly what you're asking here. I mean, you could have both. You could have a very broad review and it drills down deep in every single inclusion, every single study related to that topic.

The problem with that is, it would be years getting a review done. I speak from experience. Believe me. I speak from experience. So the value, if you please, the real value of scoping reviews is that it gives us a starting point to say, what's really important to us in a discipline that needs further investigation, either in terms of primary research or in terms of a systematic review process that addresses specific issues.

So yeah. The more inclusion criteria you have, it narrows things down, but then you lose data. You lose information. So it goes back to the question you're asking really.

>> JOANN STARKS: Okay. Thank you. We've got another question from Ros, not doing any statistics, does it risk gathering a bunch of low quality evidence which risks playing us in the wrong direction, and how can we reduce that risk?

>> OLIVER WENDT: That is definitely a risk that exists. It's one of the threats to the validity of a scoping review. And that was one of the major points we tried to raise in the critical reflections. So the current conception out there is that quality assessment is not necessarily a part of a scoping review, but that increases the threat. I think Chad was making a good point of whenever possible having at least a basic organization or a basic level of quality control in such a scoping review to not go in the wrong direction, and definitely kind of point out where the higher quality evidence is located, even if you don't assess it in too much depth. I would think that is a serious threat that you would gather everything in there, the low as well as the high quality evidence.

Now it could be part of your research, you could include this in your interpretation later on and pose it as a new direction for improving research in this area. But again, then you would not get around doing at least some level of quality assessment in there.

>> CHAD NYE: Ros, I think your question also sort of begs the question of what do you do with an area where the evidence is not high quality methodology. They're just, there are just not large ins for doing randomized trials or doing large group studies. And low quality evidence, at least by the hierarchy of evidence, that's the nature. That's the state of the art. So you have to factor that in to the whole question and interpretation of the question. That doesn't make the scoping review any less valuable and it doesn't make the summary of the synthesis of the evidence any less valuable. But it's a fact that has to be taken into account.

>> JOANN STARKS: Thank you. We have a question from Chris. Has anyone determined the differences in time to do a scoping versus a full blown systematic review?

>> OLIVER WENDT: In the medical literature there are some hints that for a systematic review on average takes a year to do it really well. The premise for the systematic ‑‑ or for the scoping reviews are that these take less time. So I would say maybe then by logic, less than a year. But I'm not aware of any published literature that has made an investigation on how long an average it takes review teams to just do the scoping review. The scoping review methodology is still fairly new. There isn't too much of investigation into these secondary aspects.

>> CHAD NYE: The only one I know of, it's not really published, it was done by a group in Denmark probably 10 years ago nearly. And they concluded that the systematic review took about the equivalent of 4 months full time senior author, and I forget, 20 hours a week for or 10 hours a week for a graduate assistant resources to do it, to do a systematic review. That's parsed out over a longer period. That's where it takes a year, and that would be a fairly ‑‑ that might even be a quick review in a lot of instances. But that's all systematic, full blown systematic, not scoping. I know of nothing having to do with scoping reviews.

>> JOANN STARKS: Looks like we have a couple of people getting ready to type their questions in. Here we have one from Linda. When I search for the subject I wish to pursue, there is very limited information I find for VR, yet other areas have several articles on the subject matter. How do address this and the need for research?

>> CHAD NYE: I'm not sure exactly. If these other VR articles are related to it, part of the, part of the purpose of a review is to bring those things together and synthesize them where they are amenable to that. That is, you know, if the evidence is coming from two different areas, conceptually now, you know, the focus here could be how does, how do those two things, how do those two areas relate.

If they don't match conceptually, then you're left with a summary of two unrelated but for lack of a better word, important components that simply stand on their own.

>> JOANN STARKS: Linda also comments that IDDT have many articles whereas VR/voc-rehab does not. I think you're definitely pointing out an issue in the field, Linda.

I also want to notice that Susan Lins made the comment that she has heard an evidence summary can take 1 to 2 months.

>> OLIVER WENDT: That would be the type of rapid evidence review I was talking about earlier. That is the typical timeframe to do this quick and brief status update with only the best and most current research evidence. That's the timeframe for getting something like that done.

>> JOANN STARKS: We have someone else typing in their question. Leanne is bringing a question forward.

We are getting close, we have about 4 minutes left before we'll be signing off. So while we're waiting ‑‑ go ahead.

>> CHAD NYE: Chad people are talking about, I was going to go back to Linda. If VR doesn't have the articles, then the data you have to deal with is simply IDDT and AD, then that's the nature. That's the evidence.

>> JOANN STARKS: Right. I agree. Yeah.

>> CHAD NYE: That's not your problem. That's somebody else's. If you summarize at least bring that to the discussion, bring that to the floor.

>> JOANN STARKS: Right. Okay. This is probably going to be our last question from Leanne. I am writing a scoping review but will be the only reviewer to decide which studies meet inclusion, exclusion criteria. Is this a fatal flaw and should I go back and involve a researcher to go over my research results and act as a second reviewer?

>> CHAD NYE: Well, I don't think it's fatal. In fact, that's what I see in many of the scoping reviews that I read here. I mean, I think it's better if you have more than one person there to validate the decisions that are made. You know, sometimes what you have is that the title and abstract level is one person and then on the included studies, that is, when those are coded, when those studies are identified and ultimately included, then that process is conducted by two people, and any differences are worked out before they are sort of put to paper, if you please.

So no, it's not fatal. More is always better in this case, at least in terms of validation.

>> OLIVER WENDT: I would make it contingent on where you would want to go with this in terms of publication or as an outlet for dissemination. Different organizations, different review‑producing organizations have different criteria. If this would go through Campbell or Johanna Briggs, I think they would want to see a team of at least two people. If it's for a journal I would check in that journal what previous have previous scoping reviews being done. Often times these days you are okay if it's just for journal publication, if it's one person. You can get through with that. To be on the safe side, having another person in there would definitely not hurt.

>> JOANN STARKS: Okay. Well, thank you very much. We've come to the end of our time today. I want to thank again Chad Nye and Oliver Wendt for leading today's workshop and to invite you to return next month to session 2 methods for scoping reviews.