Effect of Interventions to Facilitate Communication Between Families or Single Young People with Minority Language Background and Public Services: A Systematic Review

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Over recent decades, the number of immigrants with minority language background has increased. This has occurred in many countries, including those with a tradition of relatively low immigration.

In consequence, a higher share of children, young people and families with minority-language and immigrant backgrounds may need to communicate with public service providers. In this report, we examine whether interventions to facilitate communication between public services, on the one hand, and minority language children and youth or families with an immigrant background, on the other, are effective. Examples of such interventions are types of interpretation services and foreign language training programs.

We included in this review four studies that addressed families with children or parents with minority language backgrounds; we found no studies exclusively addressing youth with minority language backgrounds.

Three studies conducted within the health services compared the effect of different types of interpretation service (in-person interpreter, telephone interpreter, ad hoc interpreter) or bilingual personnel on different outcomes observed for families. None of these interventions appeared to stand out in favor of another. We were therefore unable to draw any conclusion on the effectiveness one of any particular type of interpretation service.

We identified one study that compared the effect of two different training programs of English as a second language (ESL) on Spanish-speaking parents’ English skills and on parents’ involvement in their children’s school work. The findings indicate that an enhanced ESL class (i.e., an intervention guided by the theoretical frame on immigrant parent involvement) had a stronger impact on parents’ involvement in students’ coursework and parents’ English skills than did an ESL-course focusing solely on language skills. Although this is a promising finding, it was obtained from a small-scale study, which had methodological limitations, and further studies with a more robust design are needed to allow firm conclusions on effectiveness to be drawn.

We did not find any studies measuring the effect of interventions on the degree of trust between the respective parties.
Executive summary/Abstract

BACKGROUND

Over recent decades, the number of immigrants with a minority language background has increased. This has occurred in many countries, including those with relatively low levels of immigration. This increase is especially pronounced in the larger cities. As a result, a higher proportion of children, young people and families with minority-language and immigrant backgrounds might need to communicate with public service providers. Public services are required by law to offer equal services to all client groups. This can mean an obligation to adjust services to cater to individual needs, e.g. with respect to language proficiency.

Statistics show that immigrant children and their parents receive assistance from child welfare services proportionately more often than those who do not have such a background. Well-functioning communication is a prerequisite to make such interventions work.

The Norwegian Directorate for Children, Youth and Family Affairs commissioned the Social Research Unit at the Norwegian Knowledge Center for the Health Services to systematically review studies of the effect of interventions to facilitate communication between immigrant children, youth or families with minority language background and the public services. Examples of such interventions are the use of professional interpretation services, cultural interpreters and bilingual case workers.

OBJECTIVES

To systematically review studies on the effect of interventions intended to facilitate the communication between immigrant children, youth or families with minority language background, and public services such as child welfare services or health services.
SEARCH STRATEGY

We conducted a systematic literature search of twelve different databases in March 2013. Additionally, we searched for grey literature on relevant websites and hand-searched reference lists of included publications.

SELECTION CRITERIA

Two review authors independently assessed the retrieved references (titles and abstracts) for inclusion/exclusion, based on the following inclusion criteria:

1) *Population*: Immigrant children, youth or families (with children under 18 years of age) with minority language backgrounds.

2) *Intervention*: a) Interventions to facilitate verbal or direct communication such as different types of interpretation services, b) interventions to facilitate written communication, such as translation of case documents or information materials, or c) broader interventions where improvement of communication between service providers and service recipients was addressed, such as second language training for parents to improve communication between school and parents.

3) *Comparison*: other active intervention or no intervention.

4) *Outcomes* addressing change in communication, user satisfaction, reported trust, use of services or similar indirect outcomes.

5) *Study design*: studies with control conditions.

DATA COLLECTION AND ANALYSIS

We extracted data from each study and summarized the results in a narrative format by means of tables for each comparison. We did not conduct meta-analyses because the included studies were too different in terms of comparisons, outcomes and in the way results were reported. In consequence, we synthesized the results of the included studies narratively and in tables, categorized according to comparators and outcomes.

We assessed the risk of bias of the included studies by using the Risk of Bias Tool of the Cochrane Collaboration. The quality of the evidence across all studies was assessed by using the Grading of Recommendation Assessment, Development and Evaluation tool (GRADE).

RESULTS AND DISCUSSION

Of a total of 9 896 references that emerged from the systematic literature search we included four studies, either randomized or quasi-randomized controlled studies.
One study addressed cooperation between schools and parents; three studies were conducted in the context of the healthcare services. We found no studies addressing children or youth only.

Three studies conducted within the health services compared the effect of different interpretation services (in-person interpreter, telephone interpreter, ad hoc-interpreter) or bilingual personnel on different outcomes observed for families. They addressed both subjective (e.g., user satisfaction, self-reported ability to communicate) and objective outcomes (e.g., words understood). The results indicate that interpretation services have a positive effect on communication. However, it makes little difference whether one chooses bilingual personnel, in-person interpreter or telephone interpreter to facilitate communication; none of these interventions seems to outperform any of the others. We are unable to conclude on the relative effectiveness of any one type of interpretation service.

One study compared the effect of two different training programs of English as a second language (ESL) on Spanish-speaking parents’ English skills and parents’ involvement in children’s school work. The findings indicate that an extended ESL Class had a higher impact on parents’ involvement in students’ schoolwork and parents’ English skills than an ESL course focusing solely on isolated language skills. As this was a small-scale study with methodological limitations, similar studies of more robust design are needed to allow any conclusions to be drawn.

We did not find any studies measuring the effect of interventions on the degree of trust between the respective parties.

There is a need for more randomized studies on a larger scale to address the effect of different interventions aimed at facilitating communication for this population, and particularly in domains beyond the health services. In addition, further studies are needed with control conditions that address the effect of similar interventions on outcomes related to children and youth.

**AUTHORS’ CONCLUSIONS**

In a health service setting, the use of an interpretation service appears to help to increase communication quality, irrespective of the kind of interpretation service chosen. There is a need for additional studies of interventions intended to facilitate communication between the population and public services, particularly for services outside health care, such as child welfare, school and early childcare, work and welfare services, and prison and probation services.
1 Introduction

1.1 BACKGROUND

Over recent decades, the number of immigrants with a minority language background has increased in many countries. This has occurred in many countries including those with a shorter immigrant history, such as Norway and Germany. The increase is particularly high in the larger cities (Muchowiecka, 2013; Texmon, 2012). Thus, in the near future it is likely that more inhabitants with minority language background will need to communicate with service providers in the public sector. In many countries, public services are now legally required to provide equal services to many kinds of user groups (FCNM, 1995). This can mean that services need to be adjusted so that users with a different language background are adequately catered for.

This report focuses on minority-language families with underage children and minority-language single youth with an immigrant background. These groups are thought to be particularly vulnerable among immigrants with a minority-language background. It is expected that these groups will have a strong need to communicate with service providers working in childcare, healthcare, schools and early childhood centres.

In general, good communication skills are needed to allow an individual to build trust when meeting new people. In the case of health care services in particular, scholars have stressed the positive relationship between successful communication and trust (Butler & Cantrell, 1994; DeLemos et al., 2010; Martin, Roter, Beach, Carson, & Cooper, 2013). Martin et al. (2013) concluded in their study on physician communication and trust among black and white patients that physician communication behaviour may have a different impact on patient trust depending on the patient’s ethnicity. Communication skills training programs addressing, for example, the handling of emotion might therefore be a promising way to reduce social disparities in health care and to increase trust among ethnic minority groups. Among public services, child and family welfare service is another typical example where communication challenges can occur with families or single young people with a minority language -background, mainly due to language or cultural barriers (Chand, 2005).
Previous research has found that immigrant children have an increased risk of being maltreated (Dettlaff, Earner, & Phillips, 2009) and receive child welfare services more often compared to children with a non-minority background (e.g. (Chahine & van Straaten, 2005). Statistics for Norway, for example, show that children and families with a minority language background more often receive practical support at their home, whereas relocation of children to foster families or child institutions is more common among families with ethnic Norwegian background (Dzamaria & Kalve, 2004).

In order for social care interventions to work with regard to families, well-functioning communication between the involved parties is needed. Similar challenges arise in other public services.

Research on health care services have shown that language barriers can reduce user-satisfaction with health services due to a reduced understanding or a reduction in adherence in follow-up services (Crossman, Wiener, Roosevelt, Bajaj, & Hampers, 2010). In education, scholars have argued that well-functioning cooperation and communication between the school and parents is crucial for children’s school achievement, and especially for the identification of early risk factors (Webster-Stratton, Reid, & Stoolmiller, 2008). Good communication with parents has been shown to have a positive impact on children’s school achievement and development in general (Raffaele & Knoff, 1999).

There has been considerable public and academic debate about unfair treatment of immigrant families with a minority language background by public services such as child welfare (Chahine & van Straaten, 2005; Chand, 2005; Dettlaff & Rycraft, 2010) and health care (Bischoff, Perneger, Bovier, Loutan, & Stalder, 2003; Hornberger et al., 1996). The issue may well relate to inadequate communication or inadequate dialogue between providers and recipients of services. A lack of reflection on a multicultural perspective among service providers can weaken trust in public services among service recipients. Researchers have suggested that limited information about immigrant families and their children, and the particular problems they face, is a great challenge in developing adequate interventions (Johnson, 2007).

Holm-Hansen, Haaland, and Myrvold (2007) have synthesized international research published between 1995 and 2006 on interventions to strengthen the ability of child welfare authorities to reach families with an immigrant background, in addition to interventions to improve cooperation between child welfare services and those families. Translation, both pure linguistic translation and cultural translation, are among the interventions studied.

At the European level, the use of a translator to facilitate communication is statutory. The European Convention on Human Rights (ECHR) requires that anyone facing a criminal charge should be provided with the services of an interpreter free
of charge if he/she does not understand the language of the proceedings. The question of using interpreters to improve communication between service providers and recipients has been raised widely, by scholars and policy-makers, in the area of crime and justice (Andenes, Gotaas, Nilsen, & Papendorf, 2000; Benmaman, 1992; Lee, 2009), social welfare, and education (Alexander, Edwards, & Temple, 2004) as well as in the health services (Eike, Forsetlund, Kirkehei, & Vist, 2010).

A 2012 qualitative study discussed the use of an interpreter in meetings between child welfare services and immigrant families with a minority-language background. The sample consisted of parents from Sri Lanka, Kosovo, Thailand, the Philippines and Albania who had been living in Norway for between two and fourteen years. This study shows some positive examples of cooperation between parents with a minority language background and caseworkers in child welfare services. Accordingly, the respondents (i.e., caseworkers) took parents’ wishes and needs seriously, were available for parents, and provided information in an understandable and open way. Although topics like cultural differences in terms of childrearing and children’s needs were addressed by parents, parents did not judge them to be problematic in this study (Fylkesnes & Netland, 2012).

As the communication process is two-sided, challenges can occur both among service providers and service users. Attitudes on either side may be influenced by prejudices based on previous experiences, and such attitudes can complicate communication. In order to manage the complexity of the problem at hand, this systematic review focuses on outcomes related to service recipients, that is, minority language families and single youth with a minority language background.

In this review, we summarize primary studies that address different kinds of interventions to facilitate communication between the target population, minority language families and single youth, on the one hand, and public service providers, on the other. Under public services, we include child and family welfare services, labour welfare services, health services (e.g. family doctors), the police department, the prison and probation service. We also include school and early childcare. While this review does not exclude studies that look at facilitating communication from a broader perspective, it focuses on the linguistic dimension of communication because the target population consists of minority language families with children or single adolescents with minority language background.

1.2 WHY IT IS IMPORTANT TO DO THIS REVIEW/PREVIOUS RESEARCH

When defining the research question we assumed we would find very few studies with a comparable control group on the effect of interventions in the field of child welfare service. We expected, however, to identify such studies in other public service areas, in particular in health services.
A preliminary, unsystematic search identified some systematic reviews within the health domain on the effect of a professional interpreter service on the quality of care for psychiatric patients (Bauer & Alegria, 2010), and more generally for patients with minority language background (Eike et al., 2010; Karliner, Jacobs, Cehn, & Mutha, 2006).

Karliner et al. (2006) systematically synthesized research on the effect of professional interpreter services on user satisfaction with hospital care and on communication. They found that professional interpreter services had a greater impact on patients’ satisfaction and communication compared to ad-hoc services. This finding was later confirmed by Bauer and Alegria (2010) within the field of psychiatric care.

Eike et al. (2010) systematically reviewed studies on the effect of interventions to improve the quality of health care services provided to ethnic minorities. They did not limit the target group to minority language users with an immigrant background; in addition, they included aboriginals and national minorities, such as religious groups, which do not necessarily face language barriers. Eligible interventions addressed in particular health care personnel and organizations.

In this systematic review, however, we address a broader context than health care and include other public services such as child welfare services, school and early childcare. The target population is however limited to minority language families and single adolescents with an immigrant background.

We identified some primary studies looking at the effect of interpreter services and bilingual personnel on outcomes related to communication and user satisfaction with, for example, families with limited English proficiency (Crossman et al., 2010; Karliner et al., 2006). Further, one expert recommended to us a randomized controlled trial in Norway which had investigated the effect of parental training for immigrant parents on child upbringing practices and child behaviour (Bjørknes & Manger, 2012).

With respect to the target population, immigrant families with underage children and immigrant single underage children and youth with minority-language background, there is a need for a systematic review on the effect of interventions to facilitate communication with public services.
1.3 INTERVENTIONS TO FACILITATE COMMUNICATION BETWEEN IMMIGRANTS WITH MINORITY-LANGUAGE BACKGROUND AND PUBLIC SERVICE

1.3.1 Definitions

Immigrants with minority-language background are defined in this review as all people with a mother tongue that differs from the language of the country to which they immigrated. In this review, we include all kinds of minority-language immigrants, independent of country of origin or mother tongue.

Communication deals with all kinds of exchange of meaning or content between individuals and groups by the means of a common system of symbols that can consist of verbal or non-verbal signs, such as body language. By improved communication, we mean that the information given by the service providers is better understood by service users, and has a positive impact on users’ satisfaction with the service, which in turn might lead to increased use of an intervention.

There are several definitions of trust. Giddens (1997) distinguishes between relational, systemic and implicit trust. Both relational and systemic trust are relevant for the research question at hand. While relational trust means trust which can arise in direct meetings between individuals, such as between a family with minority-language background and an individual case worker in child welfare services, systemic trust concerns relations between single individuals and institutions; that is, the trust an individual family places in the public service sector in general. It is assumed that a successful communication and a well-functioning dialogue facilitates trust (Bauer & Alegria, 2010).

User satisfaction is a complex construct which is affected by many factors, including individual lifestyle, individual experiences and expectations for the future, and the values of individuals and society (Carr-Hill, 1992). User satisfaction can be defined as a cognitive process in comparing wanted and actual reality, leading to the confirmation or avoidance of expectations. As a direct emotional reaction, user satisfaction or dissatisfaction is a direct consequence of such a cognitive process (Homburg & Rudolph, 1995). User satisfaction can be measured in different ways. In health service research, there are different methods to measure patient satisfaction, ranging from a few specific questions to more elaborate questionnaires. The EUROPEP questionnaire is a prominent example; it was developed by a group of European researchers and has been used and evaluated in sixteen countries. Patients evaluate their doctor according to qualifications, interpersonal relations, information sharing and support, accessibility and the organisation of service (Grol et al., 2000).
1.3.2 Interventions

We consider the following interventions to be eligible:

1.3.2.1 Types of interpretation services

The research literature distinguishes between interpreter and translator. An interpreter is someone who orally translates a person’s speech in a different language to an audience while the original speech is given (Ozolins, 1991). There are different types of translating services. One can speak of consecutive interpretation when the translator translates the content of speech in relatively brief intervals, while the speaker makes a short break. By contrast, in simultaneous interpretation the interpreter translates while the speaker is speaking. Both consecutive interpretation and simultaneous interpretation can be used for interpretation in attendance, which means that both interpreter and speaker are in the same room, or in long-distance interpretation, where the interpreter and speaker(s) are connected remotely through phone or videoconferencing. Dialogue interpretation refers to the translation of dialogues, while the interpreter changes between two different languages, in contrast to monologue interpretation where one person’s speech is translated into another language. Interpretation in attendance and dialogue interpretation are the interpretation services most commonly used in public services.

The interpreter needs to have contextual knowledge, both professional and cultural, in order to achieve adequate translations. To avoid misunderstandings that can arise from the use of metaphors and terms that are difficult to translate, it is generally recommended that those using interpretation services explicitly define core terms and metaphors. Instead of professional interpretation, the use of ad hoc interpreters is relatively common in social and child services and other public services; ad hoc interpreters might be family members, friends or other people who serve as a translator without having formal training or qualifications.

1.3.2.2 Bilingual or multi-lingual case worker/professional

A bilingual professional or bilingual provider within the public service sector can be defined as a caseworker or professional (e.g. physician) who has at least two languages, the mother tongue and a second language she or he can use in communication with minority language users. A bi- or multi-lingual professional can for example be a second generation immigrant with parents having a different mother tongue than the majority language population and who may be fluent in both mother tongue and majority language (Crossman et al., 2010).
1.3.2.3 Link-workers

Link-work can be described as a form of contact making or bridge-building intended to improve the interaction between immigrants and the new country. Some scholars stress that one of a link-worker’s task is to find out who in a local minority environment has particular needs in terms of communication with the public services. Link-workers are most often employed in the public service sector, and usually enjoy a high degree of trust among the target population. They often play a crucial role as mediators between users and service providers, and in resolving conflicts. It is assumed that link-workers can reduce language and cultural barriers between families with a minority language background and service providers. There are many synonymous terms for this role, including minority consultants, cultural interpreters and cultural translators. It is common for these kinds of interventions to have a hybrid character, combining linguistic and cultural translation. No standardised training exists, and requirements might therefore vary according to educational background, actual competence and recruitment. Link-workers are usually trained by professionals, but the tasks for which they are responsible can vary greatly (Holm-Hansen et al., 2007).
2 Objectives

To systematically review studies on the effect of interventions intended to facilitate the communication between immigrant children, youth or families with minority language background, and public services, such as child welfare or health services.
3 Methods

3.1 ELIGIBILITY CRITERIA

3.1.1 Interventions

Interventions addressing either the target population (i.e. families with children under 18 years of age) or single young people with a minority language background, or service providers aimed at facilitating communication between the target population and public service. By public services, we mean child and family welfare service, labour and welfare services, health services, prison and probation services, schools and early child-care centres, focusing on the communication between home and school.

- Interventions to facilitate verbal and direct communication, such as different kinds of interpretation services (ad-hoc or professional interpreters), bilingual service provider and recruitment of staff with minority language background into public service provision.

- Interventions to facilitate written communication, such as translations of case documents, information and advertisements about services addressing people with minority language background, e.g. through leaflets.

- General interventions: We will include studies on more general interventions if they explicitly aim at facilitating communication between the target group and public services in order to increase understanding and trust among service recipients. Examples of such interventions are link workers, family councils, language courses to enhance communication between families and service providers, changed routines in order to improve communication, educational interventions addressing the service provider to improve cultural competence, use of family councils in schools, and outreach interventions.

3.1.2 Participant characteristics

- Minority language background immigrant families with underage children.
- Single underage youth (refugees) with a minority language background.
3.1.3 Research design

Studies were eligible if they involved a study design that compared an intervention condition to improve communication between the population and public services with a control condition. Control conditions could be an alternative intervention, waiting list or no intervention.

To qualify as an eligible design, we required each study to meet at least one of the following three criteria:

1) random assignment of subjects to intervention and control condition, or assignment by a procedure that appears to be comparable to randomization,
2) prospective matching of individuals in the intervention and control groups on pre-test variables and/or other relevant personal and demographic variables,
3) use of a comparison group that has shown retrospective pre-test equivalence on the outcome variables and core demographic variables (e.g., sex, age, education).

Randomized controlled studies as well as quasi-randomized controlled trials, the latter applying non-random allocation processes by using generators like birth date, or the day of the week, were clearly eligible for inclusion in the review.

We included, however, one non-equivalent comparison group study, a study in which intervention and control groups were compared even though the research subjects were not randomly assigned to those groups. We required that non-randomized quasi-experimental studies applied pre-test measures on at least one outcome and a post-test measure on at least one outcome.

3.1.4 Types of comparisons

Alternative intervention, waiting list, no intervention

3.1.5 Outcomes

Outcomes capturing change in communication for families with children or single young people with a minority language background.

Examples of outcomes we considered were participation in or use of services by the target population, user satisfaction, reported trust measured for example by a numeric scale, and change in cooperation between families with small children and public services.

Indirect outcomes, in addition to direct outcomes, that we assumed could be affected by change in communication. Examples of indirect outcomes are
occurrences related to behavioural problems, emotional symptoms, school performance, language development, social competence, school-drop out and parenting skills.

3.1.6 Exclusion criteria

- Studies on the effect of interventions to facilitate communication not addressing families with children or single young people with minority language background, or interventions related to other contexts than public services, such as the workplace, leisure or further education.
- To reduce complexity related to the research question on the effect of interventions to facilitate communication, we excluded studies which captured the effect of interventions on service providers, in contrast to service recipients. We excluded studies that exclusively focused on the effect of interventions on outcomes like change of cultural sensibility or cultural competence among service providers.
- Single-group pretest-posttest designs.
- Qualitative studies.

3.2 LITERATURE SEARCH

3.2.1 Information sources and search strategy

We carried out a comprehensive search strategy to identify eligible studies in the international literature. The following 12 databases were searched: Bibsys, The Campbell Library, Cochrane Library, DARE, ERIC, EPPI-Centre evidence library, ISI Web of Science, Ovid Medline, Ovid PsycINFO, Ovid EMBASE, Sociological Abstracts, Social Care Online, Social Science Research Network (SSRN) eLibrary, Social Services Abstracts, CINAHL.

To identify grey literature we conducted a search in Open SIGLE – System for Information on Grey Literature in Europe, ERIC and Google.

In addition searched the following web pages:

www.nbbf.no
www.nova.no
http://www.sik.no
www.socialstyrelsen.se
www.sfi.dk
www.scie.org.uk
Centre for Evidence in Health, Ethnicity and Diversity
http://www.better-health.org.uk/
Social Care Institute of Excellence:
We developed a tailored search strategy which we adjusted to each database, including database’s index terms (if available) and/or free text terms. In most cases, the research strategies combined a comprehensive list of search terms related to the population, intervention and research design.

No country or language restrictions were used. The complete search strategy is given in Appendix 7.1.

3.2.2 Searching other resources

The review authors checked reference lists of the included primary studies. Given limited resources and time, the reviewers did not systematically contact experts on the field to identify related studies.

3.3 DATA COLLECTION AND ANALYSIS

3.3.1 Study selection

We used the pre-developed selection criteria described in 3.1 to select the studies for inclusion. These criteria were piloted by two review authors.

The screening and selection of studies proceeded in two phases. At Level 1, two review authors scanned the title and abstract of each reference and scored as either ‘promote to next level’, ‘exclude’, or ‘can’t tell’. Only if both review authors scored ‘exclude’ was the reference excluded at this Level. If at least one review author scored ‘can’t tell’ or ‘include’, the reference was promoted to Level 2. References promoted to Level 2 were ordered in full text and the same screening criteria were applied. Two review authors read the full texts and scored ‘include’ or ‘exclude’. If there was disagreement, a third review author decided whether to include the study.

We did not calculate the interrater reliability of individual coders’ ratings, but piloted a small number of references and discussed the screening practices as a group in order to develop high agreement between the coders before we screened the rest of the studies.
3.3.2 Data extraction

Two review authors independently coded and extracted data from each study. The data extraction sheet was piloted and revised where necessary. Any disagreement in the data extraction process was resolved by discussion. The data extraction form recorded detailed information about authors, institutions, journal, participants, intervention, control conditions, research design, sample size, outcomes and results (see Appendix 3).

3.3.3 Assessment of risk of bias

To assess the risk of bias of the included studies we used the risk of bias (RoB) tool developed by the Cochrane Collaboration (Higgins & Green, 2011) including the following domains: selection bias, performance bias, detection bias, attrition bias, reporting bias, other bias. Uncertainty or disagreement on the risk of bias domains was resolved by discussion with a third review author.

| Study quality | Bias within a study                        | Interpretation                                      |
|---------------|-------------------------------------------|-----------------------------------------------------|
| High          | Low risk of bias on all key domains       | Plausible bias unlikely to seriously alter the results |
| Medium        | Low or unclear risk of bias on all key domains | A risk of bias that raised some doubts about the results |
| Low           | High risk of bias for one or more key domains | Plausible bias that seriously weakens confidence in the results |

3.3.4 Grading of evidence

We assessed the quality of evidence using a systematic and explicit method, the Grades of Recommendation, Assessment, Development, and Evaluation” (GRADE) approach (Guyatt, Oxman, Schunemann, Tugwell, & Knottneru, 2011). We made judgments about the quality of evidence for each comparison and outcome to indicate the extent to which it is possible to be content that an estimate of effect is correct. These judgments consider study design, study quality (detailed study design and execution), consistency of results (similarity of estimates of effect across studies), directness (e.g., the extent to which people, interventions and outcome measures are similar to those of interest), precision, publication bias, large effect, plausible confounding and dose-response gradient. The following categories in grading the quality of evidence for each outcome were used:
- High: Further research is very unlikely to change our confidence in the estimate of effect.
- Moderate: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
- Low: Further research is very likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
- Very low: any estimate of effect is very uncertain.
3.3.5 Measures of treatment effect

Change in communication was assessed by self-reported satisfaction with service-provider (satisfaction with hospital stay, satisfaction with physician, nurse), ability to communicate, words understood and inaccurate utterances. For most outcomes, we calculated standardized mean-difference effect sizes (Cohen’s d).

For parental engagement in children’s schooling and parents’ ESL skills, we were unable to calculate d, as the study (Waterman, 2008) did not report number of participants (n) for the intervention and control group and dropout in each group. Thus, we have reported the study level effects in as much detail as the included studies permit. We have used Wilson’s Practical Meta-Analysis Effect Size Calculator for statistical analysis.

3.3.6 Unit of analysis issues

We took into account the unit of analysis of the studies to determine whether individuals were randomized in groups (as in cluster randomized trials), whether there were multiple intervention groups, and whether there were multiple publications for some studies.

Cluster randomized trials

We included one cluster-randomized trial (Waterman, 2008) in our report, but the authors of this study provided insufficient information to allow calculation of effect sizes. If a study had been cluster-randomised and an effect size had been provided, we would have checked to confirm that the investigators had controlled for the effect of clustering in their results and contacted the authors for further information if this was unclear. If the clustering effect had not been controlled for, we would have requested individual participant data to calculate an estimate of the intra-cluster correlation coefficient (ICC). If that was not available, we would have obtained external estimates of the ICC from similar studies, and would then have entered these data into RevMan to analyse effect sizes and confidence intervals using the generic inverse variance method (Higgins & Green, 2011: Section 16.3.3).

Multiple intervention groups

Multiple intervention groups (with different individuals) within a study having one comparison group were not pooled, nor were multiple comparison groups pooled. We planned that multiple intervention groups (with different individuals) within a study with a single control group would be pooled if appropriate and compared to the one control group, and that multiple control groups would only be pooled if the multiple interventions and/or control group did not include the same individuals. If there had been an overlap between multiple intervention groups, only one intervention group would have been coded and compared to the control group to avoid overlapping samples.
In this review, two studies, (Crossman et al., 2010; Garcia et al., 2004), compared the effect of three interventions: telephone interpreter, in person-translator and ad-hoc translator/bilingual physician.

**Multiple publications**

One study (Crossman et al. 2010) was double-published (Crossman et al. 2010; Grover et al. 2012). Since Grover et al. (2012) did a secondary analysis of Crossman et al. (2010), we exclusively used data from Crossman et al. (2010).

### 3.3.7 Dealing with missing and incomplete data

For the four studies, the reviewers assessed and reported attrition rates. None of the included studies provided reasons for attrition.

### 3.3.8 Assessment of heterogeneity

We assessed heterogeneity in terms of participants, setting, how the intervention was given, the comparator, and how and when the outcomes were measured. This assessment informed the decision not to conduct meta-analysis. As we did not conduct any meta-analysis, we did not need to assess statistical heterogeneity.

### 3.3.9 Assessment of reporting bias

Assessment of reporting bias refers to both selective reporting of outcome data and results and publication bias. Both types of bias were treated in the RoB assessment. Had sufficient studies been identified (Higgins & Green, 2011, section 10.4.1, suggest as least ten studies) we would have examined the symmetry of funnel plots in attempt to obtain information about possible publication bias. If asymmetry was present, we would have considered possible reasons for this while taking into account that an asymmetric funnel plot is not necessarily caused by publication bias and publication bias does not necessarily cause asymmetry in a funnel plot.

### 3.3.10 Meta synthesis

Had sufficient studies been identified, we would have analysed the effects of differing types of interventions, time points, and/or comparison conditions separately, conducting separate meta-analyses for each outcome construct. The four studies included in this review were however highly heterogeneous in terms of intervention types, comparator(s), outcomes and the methods of reporting results. Only two studies, Garcia et al. (2004) and Crossman et al. (2010) reported the same outcomes, i.e., satisfaction with hospital stay and satisfaction with physician. However, as the effect sizes of those two studies were based on different scales (Garcia et al. 2004: continuous scale; Crossman et al. 2010: dichotomous scale), we decided not to pool them in meta-analysis.

We have reported the study level effects in as much detail as the included studies permit.
4 Results

4.1 LITERATURE SEARCH

The search in eleven databases resulted in 9,542 references in total. The search hits were divided as follows:

- Cochrane databases (DARE included): 594
- BIBSYS: 1001
- CINAHL: 238
- ERIC: 308
- ISI Web of Science: 1,488
- Ovid EMBASE: 1,492
- Ovid MEDLINE: 2,369
- Ovid PsycINFO: 1,521
- Sociological Abstracts: 104
- Social Care Online: 345
- Social Service Abstracts: 82

In addition, we identified 353 relevant references by the search for grey literature in the System for Information on Grey Literature in Europe (Open SIGLE) (200 hits), search in Google Scholar (152 hits) and in reference lists of the included studies. Through searching the reference lists we identified one eligible study: Garcia, Roy, Okada, and Perkins (2004). In addition, one study was recommended by one of our external reviewers: Bjørknes and Manger (2012).

Figure 1 describes the selection process of relevant studies. In total, we identified 9,896 references by title and abstract. Among those, we considered 52 references as relevant and ordered the corresponding articles in full-text. A total of 47 full-text articles were excluded (see Appendix 2 for details). Four studies (summarised in 5 reports) remained included in the review.
4.2 INCLUDED STUDIES

We included four studies, all conducted in the US. These studies investigated the effect of interventions to facilitate communication between minority language immigrant families with underage children and public services. We did not identify any study focusing on single children or underage youth with a minority language background. Three of the included studies were conducted in health care settings, either in hospital or a medical office: (Crossman et al. (2010); Garcia et al., 2004; Hornberger et al., 1996). One study was conducted in a school setting and dealt with cooperation between parents and school (R. Waterman, 2008).

All four studies were randomized or quasi-randomized controlled designs: Garcia et al. (2004) can be described as a randomized controlled study, Crossman et al. (2010) and Hornberger et al. (1996) as quasi-randomized controlled studies, and R. Waterman (2008) as a cluster randomized controlled study.

Risk of bias for all four studies was assessed by means of the Cochrane Collaboration’s Risk of Bias checklist.
Three studies - (Crossman et al. (2010); Hornberger et al., 1996; R. Waterman, 2008) – were assessed as high risk of bias, while one study (Garcia et al., 2004) was assessed as having unclear risk of bias.

Table 2 presents an overview of the included studies:
Table 2: Overview over the studies included

| Study      | Design                                      | Population                                                                 | Setting                                                                 | Object (for this review)                                                                 | Intervention            | Comparison1                        | Comparison2                        | Outcome (relevant for PICO)         |
|------------|---------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------|-----------------------------------|-------------------------------------|------------------------------------|
| Crossman   | 'non-equivalent controlled design; Quasi-randomized controlled study | Families with underage children, who replied confirmative if they prefer speaking Spanish; N=1201 Telephone interpreter: N=407 In-person-interpreter: N=377 Bilingual physician: N=417 | Emergency department, at the Children’s hospital, Denver Colorado | Comparing the efficiency of telephonic interpreter, in-person medical interpreter and bilingual provider | Telephonic interpretation | In-person-interpretation | Bilingual providers | Overall satisfaction |
|            |                                             |                                                                           |                                                                        |                                                                                          |                         |                                   |                                     | Satisfaction with physician |
|            |                                             |                                                                           |                                                                        |                                                                                          |                         |                                   |                                     | Concordance of diagnosis between family and provider (in %) |
|            |                                             |                                                                           |                                                                        |                                                                                          |                         |                                   |                                     | Words understood                  |
| Garcia     | Randomized controlled study                 | Parents with limited English presenting to a Pediatric Emergency Department | Emergency department at a care pediatric emergency department | To determine whether mode of interpretation influences satisfaction of parents with limited proficiency in English | Hospital-trained interpreters | Telephone interpreters | Ad hoc interpreters               | Overall visit satisfaction |
| 2004       |                                             |                                                                           |                                                                        |                                                                                          |                         |                                   |                                     | Physician satisfaction index |
|            |                                             |                                                                           |                                                                        |                                                                                          |                         |                                   |                                     | Nurse satisfaction index          |
|            |                                             |                                                                           |                                                                        |                                                                                          |                         |                                   |                                     | Ability to communicate (single item) |
| Study     | Design                      | Population                                                                 | Setting                                                                                                               | Object (for this review)                                                                                                                                                                                                 | Intervention                                                                 | Comparison1                     | Comparison2                     | Outcome (relevant for PICO)                      |
|-----------|-----------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------|-----------------------------------|------------------------------------------------|
| Hornberger 1996 | Quasi-randomized controlled study | Spanish speaking mothers with babies                                        | Well-baby clinic of the Santa Clara Valley Medical Centre, North Carolina, USA                                         | To assess the quality of communication, interpretation, and level of patient, interpreter and physician satisfaction with remote-simultaneous interpretation and proximate consecutive interpretation | remote-simultaneous interpretation                                         | proximate consecutive interpretation |                                   | Share of inaccurately interpreted utterances |
| Waterman 2008 | Cluster-randomized controlled study | Mothers with Mexican origin who had at least one child in the participating school; schools with at least 50 immigrant parents and 85 students of low socio-economic status (SES) | Classes in elementary schools in Altura School District, a large urban school district in Colorado; | Examining the influence of an English as a Second Language (ESL) course integrating parent involvement-knowledge and behavior into instruction compared to ESL program as usual on parents’ ESL skills and parental involvement | ESL program integrating parent involvement-knowledge and behavior into instruction | ESL program as usual              |                                   | Basic English skills               | Parent involvement change over time |
4.3 ANALYSIS OF THE RESULTS

We have chosen to summarize the results of the studies narratively and in tables, as the heterogeneity was too great to consider conducting meta-analyses.

4.3.1 Different interpretation services within health care services

Three of the four studies (Crossman et al., 2010; Garcia et al., 2004; Hornberger et al., 1996) were conducted in a health care service setting (pediatric clinic) in the US. These studies compared the effect of three different kinds of interpretation services: in-person interpreter, ad-hoc interpreter, a kind of telephone/remote interpreter, in addition to a bilingual service provider.

4.3.1.1 Population, interventions and comparisons

The populations of two are described as families with limited English proficiency (Crossman et al., 2010; Garcia et al., 2004), and the population in the third study is described as non-English speaking mothers with newborn babies (Hornberger et al., 1996).

Both Garcia et al. (2004) and Crossman et al. (2010) compared three groups of families, most of them of Mexican origin, who were exposed to different kinds of interpretation services. Garcia et al. (2004) compared families who were assigned to telephone interpreter (N=60) with those assigned to ad hoc interpreter and those assigned to a hospital trained in-person interpreter (N=60). Most children were born in the US, and were on average three years old. The majority of the mothers (86 %) and fathers (72 %), however, were born in Mexico. Crossman et al. (2010) compared families who were assigned telephone interpreter (N=407) with those who were assigned to a bilingual service provider (N=417) and those assigned to an in-person interpreter (N=377). The children in these three groups were, on average, three years old. The proportion of parents with Mexican origin in these three groups was at least 90 per cent.

Hornberger et al. (1996) compared two groups of Spanish-speaking mothers having newborn babies in hospital who were assigned to either remote simultaneous interpretation (in this report denoted as telephone interpreter) (N=36) or proximate-consecutive interpretation (N=35).

4.3.1.2 Outcomes

Two studies (Crossman et al. (2010); Garcia et al., 2004) reported outcomes related to user satisfaction. Crossman et al. (2010) reported satisfaction with hospital or hospital stay (‘overall visit satisfaction’) and satisfaction with physician, both measured right after families had been discharged from hospital. In both cases,
satisfaction with hospital stay was measured using a single item on a 4-point Likert scale (1=excellent to 4=poor). In addition to ‘user satisfaction,’ Crossman et al. (2010) reported two additional outcomes which are relevant for this report: concordance between the families’ reports of their children’s diagnoses and the discharge diagnosis (concordance with diagnosis) measured as a percentage, and the proportion of words the families understood (words understood). ‘Words understood’ was measured with one question on a 4-point Likert scale (from 1=excellent to 4=poor).

Garcia et al. (2004) reported satisfaction with hospital stay in general (‘overall visit satisfaction’), satisfaction with physician and satisfaction with nurse. Overall visit satisfaction was measured by a single item. Two outcomes, satisfaction with physician and satisfaction with nurse, were each measured by a global index on five items, and both were measured directly before discharge from the emergency ward. The authors reported a four-point Likert scale ranging from 1=excellent to 4=poor. Finally, the authors weighted all questions using a 100-point scale to facilitate interpretation of the results.

Even though the two studies operationalized user satisfaction with a single item measured by a four-point Likert scale, they reported the results in a different way. Garcia et al. (2004) re-calculated the results to a 100-point scale from items that were originally operationalized on a four-point scale to facilitate interpretation.

Hornberger et al. (1996) reported the number of utterances during a hospital stay and reported the percentage of inaccurate oral utterances.

### 4.3.2 Telephone interpreter compared to in-person interpreter

a) Satisfaction with hospital stay in general terms
Two studies (N=904) (Crossman et al., 2010; Garcia et al., 2004) compared families assigned to telephone interpreters with families assigned to in-person interpreters. Crossman et al. (2010), who used a reversible scale ranging from 1=excellent to 4=poor, found that 90.2 per cent of those assigned to in-person interpreters scored excellent or good on satisfaction with hospital stay in general, compared to 89.9 per cent of those assigned to telephone interpreters. Garcia et al. (2004), who weighted the results with a 100-points scale, did not find any statistically significant differences between the two groups.

b) Satisfaction with physician
Two studies (Crossman et al. (2010); Garcia et al., 2004), compared families assigned to telephone interpreters with families assigned to in-person interpreters and reported satisfaction with physician. Crossman et al. (2010) did not find any statistically significant difference in satisfaction with physician between the two
groups. Garcia et al. (2004), showed that families assigned to in-person interpreters on average were more satisfied than those assigned to telephone interpreters, with a statistically significant difference of 15 points on a 100-point scale.

c) Concordance with discharge diagnosis
Crossman et al. (2010) (N=784) compared concordance with discharge diagnosis between families assigned to a telephone interpreter and families assigned to an in-person interpreter, and health personnel. The authors found no statistically significant difference between the two groups.

d) Ability to communicate
One study (Garcia et al., 2004) compared ability to communicate with hospital staff between families assigned to a telephone interpreter and families with an in-person interpreter. Families assigned to an in-person interpreter scored 15 points higher with an average value of 78 points (SD=17.1, p<.05), based on a 100-points scale.

e) Words understood
One study (Crossman et al., 2010) compared ‘words understood’ in families assigned to telephone interpreters with those assigned to in-person-interpreters. Crossman et al. (2010) found a statistically significant difference between the two groups, i.e. they found that 98.7 per cent of those assigned to in-person interpreters scored excellent or good on ‘words understood’, compared to 96.3 per cent of those assigned to telephonic interpreters.

f) Inaccurate utterances (in per cent)
Hornberger et al. (1996) measured the differences in the share of inaccurate utterances for mothers in conversation with health care staff and found that families who were assigned a telephone interpreter on average had a lower level of inaccurate utterances compared with the group assigned to an in-person interpreter (p<.05).
Table 2 Summary of findings for the effect of telephone interpreter (TI) compared to in-person interpreter (II) for families with limited English proficiency

| Outcomes/ Studies | Comparison of risk between the two groups * (95% CI) | Mean Difference (MD), 95% CI | Standard mean difference (d), 95% CI | Number of participants (studies) | Quality of the evidence (GRADE) |
|-------------------|-----------------------------------------------------|-------------------------------|-----------------------------------|---------------------------------|--------------------------------|
| Satisfaction with hospital stay | 90.2 % 89.9 % | d= -0.0127 (95% CI: -0.2709; 0.2455) | 904 (2: Crossman 2010; Garcia 2004) | ☯ ☯ ☯ ☯ low¹ |
| Crossman (2010): 4-point Likert scale; 1=excellent; 4=poor (% of those scoring excellent/good) | | | | |
| Garcia (2004): weighted 100-points scale (with 100 as a maximum value); Mean (SD) | 79 (16.2) 74 (15.3) | MD -5 (95% CI: -10.64 to 0.64) | d= -0.3163 (95% CI: -0.6764; 0.0438) | | |
| Satisfaction with physician | 98.7 % 98.0 % | d= -0.2175 (95% CI: -0.8385; 0.4034) | 904 (2: Crossman 2010; Garcia 2004) | ☯ ☯ ☯ ☯ low¹ |
| Crossman (2010): 4-point Likert scale; 1=excellent; 4=poor (% of those scoring excellent/good) | | | | |
| Garcia (2004): weighted 100-points scale (with 100 as a maximum value); Mean (SD) | 96 (8.7) 81 (16.1) | MD -15 (95% CI: -19.63 to -10.37) | d= -1.1592 (95% CI: -1.5459; -0.7724) | | |
| Concordance with discharge diagnosis (% share who reported same diagnosis as health personnel) | | | | | |
| Crossman (2010) | 95.5 % 95.1 % | d= -0.0467 (95% CI: -0.4118; 0.3185) | 784 (1: Crossman 2010) | ☯ ☯ ☯ ☯ low² |
| Ability to communicate (measured with a 100 points scale); Mean (SD) | | | | | |
| Garcia (2008) | 78 (17.1) 63 (18.7) | MD -15.00 (95% CI: -21.41 to -8.59) | d= -0.8372 (95% CI: -1.2103; -0.464) | 120 (1: Garcia 2004) | ☯ ☯ ☯ ☯ low³ |
| Number of words understood (4-points Likert scale, with 1=excellent and 4=poor) | | | | | |
| Outcomes/ Studies | Comparison of risk between the two groups *(95% CI)* | Mean Difference (MD), 95%; CI | Standard mean difference (d), 95% CI | Number of participants (studies) | Quality of the evidence (GRADE) |
|-------------------|---------------------------------|----------------------------|----------------------------------|-------------------------------|-----------------------------|
| Assumed risk Control: II | Corresponding risk Intervention: TI | | | | |
| Crossman (2010), % of those scoring excellent/good | 96.3 % | 98.7% | d=-0.5768 (95% CI: -1.1403; -0.0134) | 784 (1: Crossman 2010) | ⊕⊕⊕⊕ low | 2
| Estimated per cent difference in inaccurate utterances between Ti and TII (data used from first and second visit) | 22.9 | 17.1 | MD=3 (CI: -5.4; -0.6) | 71 (1: Hornberger 1996) | ⊕⊕⊕⊕ very low | 4

1 high Risk of Bias (RoB) in Crossman (2010); unclear RoB in Garcia (2004)
2 high RoB and only one study
3 unclear RoB and only one study
4 high RoB, only one study with very few participants.

When comparing the effect of a telephone interpreter and an in-person interpreter for families with limited English proficiency we found

- inconsistent results for user satisfaction (both satisfaction with hospital stay and satisfaction with physician);
- no statistically significant difference between the two interpretation services for concordance with with discharge diagnosis.
- For self-reported ability to communicate the results were in favor of an in-person interpreter, for number of words understood and share of inaccurate utterances the results were in favor of a telephone interpreter.

For all the outcomes reported, the quality of evidence was assessed to be low or very low. The type of professional interpretation service chosen might not play an important role in facilitating the communication between health service and families with minority language background.

### 4.3.3 Telephone interpreter compared to bilingual physician

a) Satisfaction with hospital stay in general terms

Crossman et al. (2010) (N=824) compared satisfaction with hospital stay in general between families assigned to a telephone interpreter and those assigned to a bilingual physician. General satisfaction with hospital stay was operationalized by a single item on a 4-point Likert scale (1=excellent; 4=poor). The authors did not show any significant differences for satisfaction with hospital stay in general in terms of per cent between the two groups.

b) Satisfaction with physician
Crossman et al. (2010) measured the effect of these two interpretation services on satisfaction with physician, which was operationalized with a single item on a 4-point Likert scale (1=excellent; 4=poor). The authors did not find any significant difference between the two groups for satisfaction with physician in terms of percent share on excellent or very high satisfaction.

c) Concordance with discharge diagnosis
Crossman et al. (2010) did not find any significant difference between the two groups in terms of the share reporting concordance with discharge diagnosis.

d) Number of words understood
Crossman et al. (2010) measured the effect of telephone interpreter and bilingual physician on the number of words understood. The results did not show any significant differences for the two groups in the share of percent reporting a high or very high number of words understood.
Table 3: Summary of findings for the effect of telephone interpreter (TI) compared to bilingual physician (BP) for families with limited English proficiency

| Outcomes/ Studies | Comparison of risk between the two groups * (95% CI) | Risk Difference (DD), 95%; CI | Standard mean difference (d), 95% CI | Number of participants (studies) | Quality of the evidence (GRADE) |
|-------------------|-----------------------------------------------|-------------------------------|--------------------------------------|---------------------------------|-------------------------------|
|                    | Assumed risk Control: BP | Corresponding risk Intervention: TI |                                      |                                 |                               |
| Satisfaction with hospital stay | 89.4 % | 89.9 % | 0.00 (95% CI: -0.04; 0.05) | 0.0285 (95% CI: -0.2192; 0.2762) | 824 (1: Crossman 2010)² | ⊕⊕⊕⊕ ⊙ low¹ |
| Satisfaction with physician | 97.1 % | 98 % | 0.01 (95% CI: -0.01; to 0.03) | 0.2153 (95% CI: -0.2838; 0.7144) | 824 (1: Crossman 2010)² | ⊕⊕⊕⊕ ⊙ low¹ |
| Concordance with discharge diagnosis | 95.4 % | 95.1 % | -0.00 (95% CI: -0.03; 0.03) | -0.0437 (95% CI: -0.3984; 0.3109) | 824 (1: Crossman 2010)² | ⊕⊕⊕⊕ ⊙ low¹ |
| Number of words understood | 96.9 % | 96.3 % | -0.01 (95% CI: -0.03; 0.02) | | 824 (1: Crossman 2010)² | ⊕⊕⊕⊕ ⊙ low¹ |

¹ high RoB and only one study
* Non-equivalent control group design; those families assigned to bilingual physicians were not allocated randomly.

In sum, no statistically significant differences were reported about effect between telephone interpreters and bilingual physician on satisfaction with hospital stay in general, satisfaction with physician, concordance with discharge diagnosis and number of words understood.

For all four outcomes, the quality of evidence was assessed to be very low. The decision to choose one particular interpretation service probably does not play any role in facilitating the communication between health care service and families with minority language background.

4.3.4 Telephone interpreter compared to ad-hoc interpreter

We only identified one study that compared the effect of telephone interpretation service to ad-hoc interpreters for families on different outcomes such as ability to communicate, satisfaction with hospital stay in general, satisfaction with physician and satisfaction with nurse.
a) Satisfaction with hospital stay in general.
No statistically significant differences were reported for satisfaction with hospital stay in general between families assigned to telephone interpreters and families assigned to ad-hoc interpreters.

b) Satisfaction with physician
No statistically significant differences were reported for satisfaction with physician between families assigned to telephone interpreters and families assigned to ad-hoc interpreters.

c) Satisfaction with nurses
No statistically significant differences were reported for satisfaction with nurses between families assigned to telephone interpreters and families assigned to ad-hoc interpreters.

d) Ability to communicate
The study reported a statistically significant difference of 8 points (based on a 100-point scale) in ability to communicate between families assigned to telephone interpreter and families assigned to ad-hoc interpreter, in favour of an ad-hoc interpreter.
Table 4 Summary of findings for the effect of telephone interpreter (TI) compared to ad hoc interpreters (AI) for families with limited English proficiency

| Outcomes/ Studies | Comparison of risk between the two groups * (95% CI) | Mean Difference (MD), 95%; CI | Standard mean difference (d), 95% CI | Number of participants (studies) | Quality of the evidence (GRADE) |
|-------------------|----------------------------------------------------|-------------------------------|-------------------------------------|----------------------------------|-------------------------------|
| Satisfaction with hospital stay | Assumed risk Control: AI 72 (17.2) 74 (15.3) | MD=2.00 (95% CI: -3.82 to 7.82) | d=0.1229 (95% CI: -0.2353; 0.481) | 120 (1: Garcia 2004) | ⊕⊕⊕⊕ low1 |
| Satisfaction with physician | Corresponding risk Intervention: TI 83 (15.6) 81 (16.4) | MD=-2.00 (95% CI: 7.73 to 3.73) | d=-0.125 (95% CI: -0.4831; 0.2332) | 120 (1: Garcia 2004) | ⊕⊕⊕⊕ low1 |
| Satisfaction with nurse | Garcia (2004) (measured with a 100 points scale); Mean (SD) 77 (19.0) 77 (15.4) | MD=0.00 (95% CI: -6.19 to 6.19) | d=0.00 (95% CI: -0.3578; 0.3578) | 120 (1: Garcia 2004) | ⊕⊕⊕⊕ low1 |
| Ability to community | Garcia (2004) (measured with a 100 points scale); Mean (SD) 71 (23.0) 63 (18.7) | MD=8.00 (95% CI: -15.50; -0.50) | d=0.3817 (95% CI: -0.7428; -0.0206) | 120 (1: Garcia 2004) | ⊕⊕⊕⊕ low1 |

* unclear RoB and only one study

The evidence consists only of one study with few participants. The study authors did not report any statistically significant differences in effect between families assigned to telephone interpreters and families assigned to ad-hoc interpreters for satisfaction with hospital stay, satisfaction with physician and satisfaction with nurse, while they report a small statistically significant difference for self-reported ability to communicate, in favour of an ad-hoc interpreter.

We assessed the quality of the evidence to be low. The choice between telephone interpreter and ad hoc interpreter does not appear to play any role in facilitating the communication between health care service and families with minority language background.

4.3.5 In-person interpreter compared to bilingual physician

The results presented refer to only one study. Crossman et al. (2010) compared the effect of an in-person interpreter with the effect of a bilingual service provider between families for the following outcomes: satisfaction with hospital stay in general, satisfaction with physician, concordance with discharge diagnosis and number of words understood between physician and family. Satisfaction with
hospital stay, satisfaction with physician and words understood were each measured by a single item on a four-point Likert scale ranging from 1=excellent to 4=poor.

a) Satisfaction with hospital stay in general
Crossman et al. (2010) showed a statistically significant lower satisfaction with hospital stay in general for families assigned to an in-person interpreter (Median=2) compared to families assigned to a bilingual physician (Median=1).

b) Satisfaction with physician
Crossman et al. (2010) showed a statistically significant and a slightly lower satisfaction with physician for families assigned to an in-person interpreter (Median=2) compared to families assigned to a bilingual physician (Median=1).

c) Concordance with discharge diagnosis
The study did not show any statistically difference in concordance with discharge diagnosis between families assigned to an in-person interpreter compared to families assigned to bilingual physicians.

d) Number of words understood
The study showed that families assigned to in-person interpreters had a statistically significant lower score in number of words understood (Median=2) compared to families with a bilingual physician (Median=1).

Table 5 Summary of findings for the effect of in-person telephone interpreter (II) compared to bilingual physician (BP) for families with limited English proficiency

| Outcomes/ Studies                          | Comparison of risk between the two groups * (95% CI) | Risk Difference (DD, 95%; CI) | Standard mean difference (d), 95% CI | Number of participants (studies) | Quality of the evidence (GRADE) |
|-------------------------------------------|-----------------------------------------------------|-----------------------------|-------------------------------------|----------------------------------|----------------------------------|
| Satisfaction with hospital stay           | 90.8 %                                               | 100 %                       | d=0.0412 (95% CI: -0.2131; 0.2955) | 794 (1: Crossman 2010)^1         | ⊗⊗⊗⊗ low^1                       |
|                                           | (assumed risk Control: BP                            | Corresponding risk          |                                     |                                  |                                  |
|                                           |                                                     | Intervention: II            |                                     |                                  |                                  |
| Satisfaction with physician               | 97.1                                                 | 98.7                        | d=0.4328 (95% CI: -0.1476; 1.0133)  | 794 (1: Crossman 2010)^1         | ⊗⊗⊗⊗ low^1                       |
|                                           | (assumed risk Control: BP                            | Corresponding risk          |                                     |                                  |                                  |
|                                           |                                                     | Intervention: II            |                                     |                                  |                                  |
| Concordance with discharge diagnosis      | 794                                                  | (1: Crossman 2010)^1        |                                     |                                  |                                  |
|                                           | (assumed risk Control: BP                            | Corresponding risk          |                                     |                                  |                                  |
|                                           |                                                     | Intervention: II            |                                     |                                  |                                  |

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| Outcomes/ Studies | Comparison of risk between the two groups * (95% CI) | Risk Difference (DD), 95%; CI | Standard mean difference (d), 95% CI | Number of participants (studies) | Quality of the evidence (GRADE) |
|------------------|--------------------------------|-----------------------------|--------------------------------|-------------------------------|-------------------------------|
|                  | Assumed risk Correlation: BP | Corresponding risk Intervention: II |                              |                               |                               |
| Crossman (2010) (% of those scoring excellent/good) | 95.4 % | 95.5 % | d=0.006 (95% CI: -0.3632; 0.3752) | 794 (1: Crossman 2010) | ⊕⊕⊝⊕ low1 |

Number of words understood
(4-points Likert scale, with 1=excellent and 4=poor)

| Crossman (2010), (% of those scoring excellent/good) | 96.9 % | 98.7% | d=0.4813 (95% CI: 0.4813; -0.0926) | 794 (1: Crossman 2010) | ⊕⊕⊕⊕ low1 |

1 high RoB and only one study

There is no statistically significant difference on all outcomes taken together. Further, we assessed the quality of evidence for all outcomes to be low.

### 4.3.6 In-person interpreter compared to ad-hoc interpreter

Garcia et al. (2004) (N=120) compared the effect of in-person interpreters with ad-hoc interpreters between families on outcomes such as satisfaction with hospital stay in general, satisfaction with physician, satisfaction with nurse and ability to communicate. Originally, satisfaction was measured by a 4-point Likert scale; the results were weighted afterwards, and the authors reported the results on a 100-point scale, with 100 as maximum value.

a) Satisfaction with hospital stay in general
The study showed a statistically significant (p<0.05), 8-point higher satisfaction with hospital stay for families assigned to in-person interpreter (average=79).

b) Satisfaction with physician
The authors reported a statistically significant (p<0.05) and 13 point higher satisfaction with physician for families assigned to in-person interpreters (average=96) compared to those assigned to ad-hoc interpreters.

c) Satisfaction with nurse
Further, the study showed a statistically significant (p<0.05) and 12 point higher value in user satisfaction with nurses among families assigned to in-person interpreters (Average=89) compared to families assigned to ad-hoc interpreters.

d) Ability to communicate
Garcia et al. (2004) showed no statistically significant difference in ability to communicate with health care personnel between families assigned to in-person interpreters and families assigned to ad-hoc interpreters.
| Outcomes/ Studies | Assumed risk | Comparison of risk between the two groups * (95% CI) | Mean Difference (MD), 95%; CI | Standard mean difference (d), 95% CI | Number of participants (studies) | Quality of the evidence (GRADE) |
|-------------------|--------------|------------------------------------------------------|-------------------------------|--------------------------------------|-------------------------------|-------------------------------|
|                   | Control: AI  | Corresponding risk Intervention: II                  |                               |                                      |                               |                               |
| **Satisfaction with hospital stay** |              |                                                      |                               |                                      |                               |                               |
| Garcia (2004) (measured with a 100 points scale); Mean (SD) | 72 (17.2) | 79 (16.2) | MD=7.00 (95% CI: 1.02; 12.98) | d=0.419 (95% CI: 0.0151; 0.7059) | 120 (1: Garcia 2004) | ⊗⊗⊗⊗ low¹ |
| **Satisfaction with physician** |              |                                                      |                               |                                      |                               |                               |
| Garcia (2004) (measured with a 100 points scale); Mean (SD) | 83 (15.6) | 96 (8.7) | MD=13.00 (95% CI: 8.48;17.52) | d=1.0293 (95% CI: 0.6485; 1.4101) | 120 (1: Garcia 2004) | ⊗⊗⊗⊗ low¹ |
| **Satisfaction with nurse** |              |                                                      |                               |                                      |                               |                               |
| Garcia (2004) (measured with a 100 points scale); Mean (SD) | 77 (19.0) | 89 (13.2) | MD=12.00 (95 % CI: 8.15; 17.85) | d=0.7335 (95% CI: 0.3639; 1.1032) | 120 (1: Garcia 2004) | ⊗⊗⊗⊗ low¹ |
| **Ability to communicate** |              |                                                      |                               |                                      |                               |                               |
| Garcia (2004) (measured with a 100 points scale); Mean (SD) | 71 (23.0) | 78 (17.1) | MD=7.00 (95% CI: 0.25 to 14.25) | d=0.3454 (95% CI: -0.0151; 0.7059) | 120 (1: Garcia 2004) | ⊗⊗⊗⊗ low¹ |

¹ unclear RoB and only one study

Statistically significant differences were reported between families assigned to in-person interpreters and those assigned to ad hoc interpreters for satisfaction with hospital stay in general, satisfaction with physician and satisfaction with nurse, in favor of in-person interpreters. No statistically significant differences were reported between the two groups on ability to communicate.

We assessed the quality of evidence for the outcomes described as low. The results indicate that in-person interpreters have some stronger effect on different outcomes, but there is no difference in effect between in-person interpreters and ad-hoc interpreters in ability to communicate.

**4.3.7 Language course for parents within a school context**

An American study by R. Waterman (2008) is the only eligible study we identified which was not within the health sector. This cluster-randomized study randomized school classes to intervention and control conditions. The population consisted of Mexican mothers with a Spanish mother-tongue who had one or more children in the particular school. One group of mothers received an extended English as a second language (ESL) instruction, integrating authentic parent-involvement goals.
into school-based adult ESL classes. The comparison group received a pure ESL class, where English skills were taught as isolated skills such as word lists and specific grammatical concepts.

Mothers in both groups averaged 32 years of age, had low income and had completed an average of six years of primary school.

The study looked at the effect of the two language teaching programs on mothers’ basic skills in ESL and parents’ involvement in children’s school-work.

4.3.7.1 Basic skills in ESL
R. Waterman (2008) measured basic skills in English using the ‘Basic English Skills Test’ developed by the Center for Applied Linguistics in 1989 (Center for Applied Linguistic, 1989). Pre- and post-tests were conducted; post-tests were conducted six months after the implementation. According to the investigator, this test was a valid and reliable test for assessing oral skills where students could achieve a value between 0 and 75 points. The study showed that mothers in the intervention group who received the extended ESL program, on average achieved a 17.5 point higher increase compared to the control group, by 24.5 points compared to 7 points. This difference was statistically significant.

4.3.7.2 Parental involvement
The investigator assessed parents’ involvement at pre-test and at post-test, i.e. six months after program implementation using a survey with 20 questions. The investigator, however, did not give any information on the validity and reliability of the survey items. According to the underlying hypothesis of the study, the results showed that the intervention group that was assigned to an extended ESL program achieved a greater increase in parental involvement (11.4 points), compared to the control group that was assigned to a standard ESL program (1.8 points). The difference in parental involvement between intervention and control group at post-test (9.6 points) was statistically significant (p<0.05).
Table 7 Summary of findings for the effect of extended English as a second language classes ('extended ESL') compared to pure ESL for Mexican mothers with limited English proficiency

| Outcomes/ Studies | Comparison of risk between the two groups * (95% CI) | Mean Difference (MD), 95% CI | Standard mean difference (d), 95% CI | Number of participants (studies) | Quality of the evidence (GRADE) |
|-------------------|-----------------------------------------------|-----------------------------|--------------------------------------|-------------------------------|-------------------------------|
| Assumed risk      | Control: pure ESL                             | Corresponding risk           | Intervention: extended ESL           |                               |                               |
| Basic ESL skills  |                                               |                             |                                      |                               |                               |
| Waterman (2008):  | (change over time on average: posttest – ESL, pretest after six month, ESL skills were assessed by a 75-point scale. | 7                           | 24.5                                 | MD=17.50 (95% CI: 9.32; 25.68) | 87 (1: Waterman 2008)          | ⊕⊕⊕⊕ very low\(^1\) |
|                   |                                               |                             |                                      |                               |                               |                               |
| Parental engagement |                                             |                             |                                      |                               |                               |                               |
| Waterman (2008):  | Change over time on average: ESL, posttest - ESL, pretest after 6 month. Parental engagement was assessed by a 25-point scale in a survey. | 1.8                         | 11.4                                 | MD=9.60 (95% CI: 5.12; 14.08) | 87 (1: Waterman 2008)          | ⊕⊕⊕⊕ very low\(^2\) |

\(^1\) high RoB in three categories: detection bias, attrition bias, other sources of bias: cluster randomization

\(^2\) small sample size: N=87 and high drop-out (n=21)

Comparing an extended ESL class instruction with a pure ESL instruction, we found a statistically significant increase in change over time (after six months) in Basic English skills and parental engagement for the group receiving extended ESL class instruction. The quality of evidence was assessed to be very low, which means that we cannot place great confidence in the conclusion that an extended ESL class instruction increases Basic English skills and parental engagement among Spanish speaking Mexican mothers more than a standard ESL class. Yet the finding as such is promising and it would be appropriate to replicate the study for different populations and different settings. In view of increasing immigration in many countries, there is a need for similar studies comparing the effect of pure second language instruction and extended second language instruction, in different countries and for majority languages other than English.
The overall aim of this systematic review was to synthesize and critically assess studies which focused on the effect of interventions to facilitate the communication between families with children or individual children and youth with a minority language background on the one hand, and public services on the other.

We included four studies: one randomized controlled study, two quasi-randomized controlled studies, and one cluster-randomized controlled study. Among these four studies, three were in a health care setting and compared the effect of different types of interpretation service (in-person interpreter, telephone interpreter and ad hoc interpreter) and bilingual personnel (physician) on objective and subjective outcomes. The reported outcomes were: satisfaction with health care staff (physician or nurse), satisfaction with hospital stay in general, concordance with discharge diagnosis, self-reported ability to communicate, self-reported language or word comprehension, and share of unnecessary utterances among families and health care professionals.

One study had a different setting and focus. It dealt with the effect of an extended ESL class instruction on Basic English skills and change in parental engagement among Spanish-speaking Mexican mothers in the USA. This study showed some promising results and should be replicated in other countries and with languages other than English as a second language. However, we cannot generalize the results to other countries with other languages as we deemed the quality of evidence to be very low. Thus, there is a need for more evidence.

Only two studies (Crossman et al., 2010; Garcia et al., 2004) used the same comparators and outcomes, comparing the effect of telephone interpreter and in-person interpreter on satisfaction with hospital stay. The remaining studies varied both in terms of comparators and outcomes. Even though the former two studies used the same outcomes and comparisons, we chose not to combine their results in a meta-analysis as the authors reported the results in different ways. Thus, we presented the results of both studies separately. In summary, the results of the three studies conducted in health care setting showed that no one type of interpretation service outperformed another; thus, the choice between bilingual professionals, in-person interpreters or telephone interpreters to facilitate communication within the
health care services appears to play only a minor role. Apart from the evidence drawn from these three studies, we cannot draw conclusions about the effectiveness of interpretation services in other contexts than health care.

The four included studies all addressed families with a minority language background, and the effect of different interventions on different outcomes were measured among parents. We did not identify any study on interventions addressing single children or youth, such as refugees. Because single children and youth make up an important group, we need more primary studies on the effect of different interventions for that group.

5.1 THE EFFECT OF INTERVENTIONS TO FACILITATE COMMUNICATION

It is difficult to draw firm conclusions as regards any one specific intervention from the results of the few studies that compared the effect of different interpretation services to facilitate the communication between families with minority language background. The differences in effect sizes are small and the quality of the evidence is low or very low.

Based on the evidence to hand we cannot draw any overall conclusion on which kind of intervention has a larger effect than any others in facilitating communication between the population and public services.

Looking at each comparison separately, we found some stronger effects of in-person interpreters on both satisfaction with hospital stay and personnel and self-reported communication skills, compared to ad-hoc interpretation. This finding is in keeping with the findings of an earlier systematic review on a similar topic. In the review on the effect of professional interpreters vs. ad-hoc interpreters on the quality of health care in hospital, Karliner et al. (2006) found a stronger effect in favor of professional interpreter service both on communication and satisfaction with service among patients with weak English skills. This systematic review included in total 28 studies, 20 in the US, and 8 elsewhere, including three from non-English speaking countries. Ten studies compared professional interpreters and ad-hoc interpreters. The review authors concluded that the use of professional interpreters had a stronger effect than ad-hoc interpreters, and thus could contribute to reducing inequalities within the health services for patients with limited English proficiency.

Further, the results from another systematic review on the effect of different interpretation services on the quality of care in psychiatry point in the same direction (Bauer & Alegria, 2010). Whether and to what extent we can transfer these
results to other settings is an open question, in the absence of similar studies within social care and welfare.

One study compared the effect of an enhanced ESL class instruction, where teachers applied knowledge on parental involvement and behavior, compared to pure ESL class instruction, on outcomes such as Basic English skills and parental involvement in children’s homework. The findings indicated that an extended ESL class had a stronger impact on engagement in children’s school work and on English skills among Spanish-speaking Mexican mothers. Even though we cannot place great confidence in a conclusion from a single study with few participants and deemed to be of low quality, this result is promising. In order to establish whether an extended language class instruction program works for other languages, more studies are needed.

5.1.1 Findings in relation to related research questions

We excluded 14 studies, which did not deal strictly with interventions to facilitate communication, but with education of people of minority language, for example in terms of nutrition routines or in terms of taking control over one’s own health.

Among these studies, nine studies were conducted in the US, one in Australia, one in Italy, two in Norway, and one in Taiwan. The first Norwegian study investigated whether written information about Vitamin D intake had an effect on the actual Vitamin D intake among mothers with minority language background after seven weeks. The study concluded that the intervention, an information leaflet, did not have any effect on mothers’ Vitamin D status. The second Norwegian study (Bjørknes & Manger, 2012) investigated the effect of a parenting program entitled Parent Management Training – Oregon Model (PMTO) on mothers’ parenting practice and children’s behaviour. The population in that study consisted of 96 mothers with origins in Pakistan and Somalia, and children aged between 3 and 9. We have not analysed or quality-assessed these studies as the research questions addressed are beyond the scope of this review.

In addition to these single studies, we note a further systematic review on educational programs addressing health care professionals and health care organizations, on the effect of those on outcomes related to patients (user satisfaction) (Eike et al., 2010).

The present systematic review addresses the question of the effect of interventions to facilitate the communication between minority language families or single children or adolescents and the public services. Thus, the report excluded qualitative studies aiming at questions addressing users’ feelings and individual experiences in the use of such interventions. Using semi-structured interviews, Edwards, Temple,
and Alexander (2005) used experiences about access to and use of different interpretation services such as professional interpreters and ad-hoc interpreters. The study authors showed that the ability to build trust, by showing empathy, being pro-active, or other different personal characteristics, is crucial for users’ understanding of well-working interpretation services. The study found that the informants preferred family members and friends instead of professional interpreters, as they had greater trust in the former and they were more accessible. However, this result comes from a single study that we did not appraise for quality, and we are unable to draw any conclusions on the evidence in relation to that particular research question. In this case, there is scope for a further systematic review dealing with questions about feelings and experiences with different types of interventions among families with minority language background.

5.1.2 Strength and limitations

To ask for help about a health related problem, such as a clearly defined somatic illness, can be regarded as less challenging compared to a situation where child and family welfare services are involved. Communication with child and welfare services can therefore be more challenging for minority language families than communication with health care professionals. Health care professionals, such as general practitioners, hospital physicians and nurses, generally use a relatively standardized terminology, in particular in the case of somatic illnesses, while the terminology of social care workers may be less standardized and more difficult for minority language families to grasp. In addition, minority language families may not be familiar with social welfare services, if equivalent services do not exist in their original country. By contrast, almost every country has some form of health service. Because the public services might be relatively unknown for some segments of the population, such as minority language families, one might expect higher demands on interventions to facilitate communication. One can theorise that general interventions may have a stronger impact compared to interventions with a limited focus on linguistic aspects of communication, as the latter do not account for the translation of ‘cultural aspects’, for example.

We need more studies with an appropriate research design - i.e. at the very least with comparable control groups – in order to get stronger evidence on what works to facilitate communication between minority language families and public services. That means we need more studies looking at the effect of different interventions on different outcomes related to communication, in different sectors, such as child and family welfare, justice, and social welfare.

With one exception, i.e. extended ESL course instruction for mothers, we have exclusively identified studies on specific interventions to facilitate verbal and direct
communication. We did not identify any studies looking at the effect of more general interventions such as link-workers, changing routines around situations which might facilitate communication, and outreach work, or training interventions addressing service providers and interpreters. Moreover, in our included studies we found indications that ‘certified training’ of interpreters makes a difference.

We conducted an extensive and systematic search in eleven databases, supplemented by a search for grey literature in order to minimize publication bias. We may, however, have overseen some potentially relevant studies because of a relatively broad definition of relevant interventions and the lack of standardized terminology.

The literature search was limited to studies with control conditions, i.e. randomized controlled trials, non-randomized controlled trials, cohort studies, pre- and post-test studies with a real control group, and interrupted time series, with the aim of examining the effect of interventions to facilitate communication.

All included studies were conducted in the United States, three within health care. Both the organization of health care services and the organization of collaboration between schools and parents can be substantially different between countries, and this has implications for the generalization of conclusions to other settings. There is a need for more studies, also in other countries, to look at the effect of similar interventions to facilitate communication in other settings than health care, including in child care services, where communication challenges might be broader than linguistic ones.
6 Conclusion

The synthesis of studies comparing the effect of different types of interpretation services did not provide a clear answer about which intervention better facilitates communication between families with minority language background and public services. The included studies looked at different comparisons, different interventions and outcomes, and reported results in different ways. Thus, we could not conduct meta-analyses. Overall, our findings did not suggest any significant difference in the effect of one particular type of professional interpretation service compared to another.

It is possible that an extended teaching plan in ESL has a larger effect compared to a pure ESL course focusing on language and grammar. We cannot however draw any clear conclusions based on a single study with considerable methodological limitations and small sample; in addition, the generalizability of a US study to other country and language settings is uncertain.

There is a need for more impact studies on facilitating communication between the minority population and the public service, particularly in fields other than health care, including child and family welfare service, the judicial system and prison and probation service. While the results of the four studies, three among them conducted in health care settings, may be transferable to a certain extent, the degree of generalization to social welfare settings is limited. Communication challenges within health care, such as in hospitals, may to a greater degree be limited to purely language issues, and thus more amenable to being overcome by means of a translation service. For the child and family welfare service, however, barriers in communication might to a stronger degree be related to both language and culture. There is a need for further studies applying a more advanced design to evaluate the effect of complex interventions to facilitate communication between the population at interest and child and family welfare services.
7 Appendix

7.1 APPENDIX 1 SEARCH STRATEGY

Number of hits (after duplet control): 9895[Google Scholar, openGREY]

Database: Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) 1946 to Present
Date: 08.02.2013
Number of hits: 2369

| #  | Searches                                                                 | Results |
|----|-------------------------------------------------------------------------|---------|
| 1  | “Emigrants and Immigrants”/                                            | 4574    |
| 2  | Refugees/                                                               | 6292    |
| 3  | (immigrant* or refugee* or immigrate* or emigrant* or emigrate*).tw.  | 21942   |
| 4  | “Transients and Migrants”/                                             | 7833    |
| 5  | (migrant* or migrate* or transient*).tw.                               | 281412  |
| 6  | Minority groups/ or Ethnic groups/                                     | 47929   |
| 7  | (foreign* or alien* or minority or minorities or ethnic* or asylum seek*).tw. | 167263  |
| 8  | translating/                                                            | 2500    |
| 9  | (multiling* or biling* or translat* or interpret*).tw.                 | 418678  |
| 10 | ((intercultural or cultural* or language) adj2 (mediator* or broker* or care*)).tw. | 1404    |
| 11 | or/1-10                                                                 | 896512  |
| 12 | language/                                                               | 25049   |
| 13 | (non native or nonnative or language or accent* or speak* or tongue*).tw. | 142159  |
| 14 | 12 or 13                                                                | 154182  |
| 15 | exp Family/                                                             | 220318  |
| 16 | exp child/                                                              | 1466015 |
|   | Term                                                                 | Count     |
|---|----------------------------------------------------------------------|-----------|
| 17 | exp adolescent/                                                      | 1513767   |
| 18 | exp Pediatrics/                                                      | 40968     |
| 19 | (family or families or parent* or father* or mother* or mum* or dad*).tw. | 992903    |
| 20 | (child or children or childhood or adolescence or youth* or pediatric* or paediatric* or boy* or girl* or kid* or juvenil* or under?age* or teen* or minors* or pubescence* or young people or young person* or infant* or preschool* or pre-school* or toddler* or baby or babies or newborn* or neonate*).tw. | 1799944   |
| 21 | or/15-20                                                            | 3860002   |
| 22 | exp communication/ or counseling/                                   | 361878    |
| 23 | professional-family relations/ or professional-patient relations/   | 30963     |
| 24 | (communicat* or informat* or interaction* or dialog* or conversation* or counsel*ing* or counselor* or consultation* or contact* or relation* or intervention*).tw. | 3169792   |
| 25 | multilingualism/                                                    | 2491      |
| 26 | Cultural diversity/                                                 | 9012      |
| 27 | Cultural competency/                                                | 2306      |
| 28 | exp social work/                                                    | 14555     |
| 29 | ((link or social or support) adj2 worker*).tw.                      | 7323      |
| 30 | (parent* adj2 (council or support)).tw.                             | 2501      |
| 31 | (outreach adj2 (target* or program*)).tw.                           | 1480      |
| 32 | ((second adj2 language) and course*).tw.                            | 52        |
| 33 | ((staff* or employee or employed or hire* or hiring or engage*) adj5 (minority or minorities or immigrant* or ethnic*).tw. | 434       |
| 34 | (matching adj2 practice*).tw.                                      | 42        |
| 35 | ((intercultural* or multicultural* or cultural* or interethnic*) adj5 (training or competen* or sensitivity or advocacy or course* or diversity or pluralism*).tw. | 5196      |
| 36 | multiculturalism*.tw.                                              | 243       |
| 37 | or/22-36                                                            | 3443615   |
| 38 | 11 and 14 and 21 and 37                                              | 5841      |
| 39 | randomized controlled trial.pt.                                    | 343687    |
| 40 | controlled clinical trial.pt.                                      | 85434     |
| 41 | clinical trials as topic.sh.                                       | 163033    |
| 42 | random*.ab.                                                         | 619430    |
|   | Searches                                                                 | Results   |
|---|--------------------------------------------------------------------------|-----------|
| 1 | exp migration/                                                           | 35156     |
| 2 | Refugee/                                                                 | 7066      |
| 3 | (immigrant* or immigrate* or emigrant* or emigrate* or refugee*).tw.    | 25124     |
| 4 | (migrant* or migrate* or transient*).tw.                                | 330990    |
| 5 | minority group/ or ethnic group/                                        | 57196     |
| 6 | (foreign* or alien* or minority or minorities or ethnic* or asylum seek*).tw. | 204152    |
| 7 | (multiling* or biling* or translat* or interpret*).tw.                  | 495091    |
| 8 | ((intercultural* or cultural* or language) adj2 (mediator* or broker* or care*)).tw. | 1591      |
| 9 | or/1-8                                                                   | 1077577   |
| 10| language/                                                                | 44291     |
|   | Raw Text                                                                 | Term Count |
|---|--------------------------------------------------------------------------|------------|
| 11| (non native or nonnative or language or accent* or speak* or tongue*).tw.| 175749     |
| 12| 10 or 11                                                                 | 192596     |
| 13| exp family/                                                              | 304315     |
| 14| child/                                                                   | 1248375    |
| 15| adolescent/                                                              | 1227254    |
| 16| exp pediatrics/                                                          | 74280      |
| 17| child welfare/                                                           | 14974      |
| 18| (family or families or parent* or father* or mother* or mum* or dad*).tw.| 1497210    |
| 19| (child or children or childhood or adolescence* or youth* or pediatric* or paediatric* or boy$1 or girl$1 or kid* or juvenil* or under?age* or teen* or minors* or pubescence* or young people or young person* or infant* or preschool* or pre-school* or toddler* or baby or babies or newborn* or neonate*).tw. | 2242676 |
| 20| or/13-19                                                                | 4413282    |
| 21| exp interpersonal communication/ or counseling/                          | 375112     |
| 22| doctor patient relation/                                                 | 78412      |
| 23| (communicat* or informat* or interaction* or dialog* or conversation* or counseling* or counselor* or consultation* or contact* or relation* or intervention*).tw. | 3839515 |
| 24| cultural competence/                                                     | 2440       |
| 25| cultural anthropology/                                                   | 43472      |
| 26| cultural sensitivity/                                                    | 483        |
| 27| social worker/                                                           | 4754       |
| 28| ((link or social or support) adj2 worker*).tw.                          | 10120      |
| 29| (parent* adj2 (council or support)).tw.                                  | 3067       |
| 30| (outreach adj2 (target* or program*)).tw.                               | 1731       |
| 31| ((second adj2 language) and course*).tw.                                | 60         |
| 32| ((staff* or employee or employed or hire* or hiring or engage*) adj5 (minority or minorities or immigrant* or ethnic*).tw. | 517    |
| 33| (matching adj2 practice*).tw.                                           | 49         |
| 34| ((intercultural* or interethnic* or multicultural* or cultural*) adj5 (training or competen* or sensitivity or advocacy or course* or diversity or pluralism*).tw. | 6022    |
| 35| multiculturalism*.tw.                                                    | 256        |
| 36| or/21-35                                                                | 4136930    |
|   |   |   |
|---|---|---|
| 37 | 9 and 12 and 20 and 36 | 6823 |
| 38 | randomized controlled trial/ | 340450 |
| 39 | random*.ab. | 775959 |
| 40 | control*.tw. | 2943107 |
| 41 | trial.ti. | 147150 |
| 42 | Time Series Analysis/ | 12232 |
| 43 | (time adj serie*).tw. | 15836 |
| 44 | cohort analysis/ or longitudinal study/ or observational study/ or retrospective study/ or prospective study/ | 696051 |
| 45 | (longitudinal* or observational or retrospective* or prospective* or cohort*).tw. | 1319369 |
| 46 | follow up/ | 686477 |
| 47 | ((follow up or followup) adj2 study).tw. | 38982 |
| 48 | case control study/ | 74305 |
| 49 | case control.tw. | 82203 |
| 50 | comparative study/ | 693741 |
| 51 | comparative study.tw. | 68014 |
| 52 | cross-sectional study/ | 88721 |
| 53 | cross sectional.tw. | 173748 |
| 54 | epidemiology/ | 172119 |
| 55 | (epidemiologic adj2 study).tw. | 6729 |
| 56 | or/38-55 | 5707834 |
| 57 | 37 and 56 | 2483 |
| 58 | limit 57 to embase | 1492 |
**Database:** PsycINFO 1806 to March Week 1 2013  
**Date:** 08.03.2013  
**Number of hits:** 1521

| # | Searches                                                                 | Results   |
|---|--------------------------------------------------------------------------|-----------|
| 1 | immigration/                                                             | 12619     |
| 2 | (immigrant* or immigrate* or emigrant* or emigrate* or refugee*).tw.    | 19848     |
| 3 | exp human migration/                                                     | 6860      |
| 4 | (migrant* or migrate* or transient*).tw.                                | 22644     |
| 5 | exp "racial and ethnic groups"/ or minority groups/                      | 92917     |
| 6 | (minority or minorities or ethnic*).tw.                                 | 78414     |
| 7 | (foreign* or alien* or asylum seek*).tw.                                | 24240     |
| 8 | exp Foreign Language Translation/                                        | 6567      |
| 9 | interpreters/                                                           | 338       |
| 10| (multiling* or biling* or translat* or interpreter*).tw.               | 42207     |
| 11| ((intercultural or cultural* or language) adj2 (mediator* or broker* or care*)).tw. | 1363     |
| 12| or/1-11                                                                 | 235766    |
| 13| language/ or foreign languages/                                         | 31084     |
| 14| (non native or nonnative or language or accent* or speak* or tongue*).tw. | 175076    |
| 15| 13 or 14                                                                | 177638    |
| 16| exp family/                                                             | 34376     |
| 17| pediatrics/                                                             | 12785     |
| 18| (family or families or parent* or father* or mother* or mum* or dad*).tw. | 430302    |
| 19| (child or children or childhood or adolescen* or youth* or pediatric* or paediatric* or boy$1 or girl$1 or kid* or juvenil* or under?age* or teen* or minors* or pubescence* or young people or young person* or infant* or preschool* or pre-school* or toddler* or baby or babies or newborn* or neonate*).tw. | 695572 |
| 20| or/16-19                                                                | 873490    |
| 21| exp communication/                                                      | 166814    |
| 22| communication barriers/                                                 | 311       |
| 23| counseling/ or community counseling/ or cross cultural counseling/ or multicultural counseling/ | 18781    |
|   | (communicat* or informat* or interaction* or dialog* or conversation* or counseling* or counselor* or contact* or relation* or intervention*).tw. | 1312152 |
|---|---|---|
| 25 | exp multiculturalism/ | 4747 |
| 26 | cultural sensitivity/ | 4761 |
| 27 | exp multilingualism/ | 7099 |
| 28 | exp social workers/ | 8505 |
| 29 | ((link or social or support) adj2 worker*).tw. | 18383 |
| 30 | (parent* adj2 (council or support)).tw. | 4458 |
| 31 | outreach program/ | 797 |
| 32 | (outreach adj2 (target* or program*)).tw. | 949 |
| 33 | ((second adj2 language) and course*).tw. | 578 |
| 34 | ((staff* or employee or employed or hire* or hiring or engage*) adj5 (minority or minorities or immigrant* or ethnic*)).tw. | 883 |
| 35 | (matching adj2 practice*).tw. | 42 |
| 36 | ((intercultural* or multicultural* or cultural* or interethnic*) adj5 (training or competen* or sensitivity or advocacy or course* or diversity or pluralism*)).tw. | 12293 |
| 37 | multiculturalism*.tw. | 2072 |
| 38 | or/21-37 | 1402702 |
| 39 | exp competence/ or training/ or personnel training/ | 26852 |
| 40 | Cross Cultural Treatment/ or Cross Cultural Differences/ or Cross Cultural Psychology/ | 40959 |
| 41 | 39 and 40 | 756 |
| 42 | 38 or 41 | 1402807 |
| 43 | 12 and 15 and 20 and 42 | 8106 |
| 44 | clinical trials/ | 6589 |
| 45 | time series/ | 1166 |
| 46 | (random* or control* or trial).tw. | 545791 |
| 47 | (time adj serie*).tw. | 4704 |
| 48 | cohort analysis/ or exp longitudinal studies/ or followup studies/ or retrospective studies/ | 28470 |
| 49 | (longitudinal* or follow up or prospective* or retrospective* or cohort*).tw. | 197421 |
| 50 | case control.tw. | 5590 |
**Database:** Cochrane Issue 2 of 12, Feb 2013, Other Reviews (DARE) Issue 1 of 4, Jan 2013, Trials (CENTRAL) Issue 1 of 12, Jan 2013, Methods Studies Issue 1 of 4, Jan 2013, Technology Assessments Issue 1 of 4, Jan 2013, Economic Evaluations  
**Date:** 06.03.2013  
**Number of hits:** 594 (Cochrane Reviews: 249, Other Reviews: 2, Trials: 324, Methods Studies: 18, Technology Assessments: 0, Economic Evaluations: 1)  
**Comment:** Results from all sub-bases were downloaded because of low number of hits. In addition, the search profile was cut down.

| ID | Search                                                                 | Hits   |
|----|------------------------------------------------------------------------|--------|
| #1 | MeSH descriptor: [Emigrants and Immigrants] explode all trees         | 52     |
| #2 | MeSH descriptor: [Refugees] explode all trees                          | 57     |
| #3 | (immigrant* or refugee* or immigrate* or emigrant* or emigrate*):ti,ab,kw | 279    |
| #4 | MeSH descriptor: [Transients and Migrants] explode all trees           | 37     |
| #5 | (migrant* or migrate* or transient*):ti,ab,kw                         | 8177   |
| #6 | MeSH descriptor: [Minority Groups] explode all trees                   | 213    |
| #7 | MeSH descriptor: [Ethnic Groups] explode all trees                     | 2348   |
| #8 | (foreign* or alien* or minority or minorities or ethnic* or asylum seek*):ti,ab,kw | 3943   |
| #9 | MeSH descriptor: [Translating] this term only                          | 36     |
| #10| (multiling* or biling* or translat* or interpret*):ti,ab,kw           | 13568  |
| #11| ((intercultural* or cultural* or language) near/2 (mediator* or broker* or care*)):ti,ab,kw | 42     |
| #12| #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11         | 26789  |
| #13| MeSH descriptor: [Language] explode all trees                          | 2638   |
| #    | Query                                                                 | Results  |
|------|----------------------------------------------------------------------|----------|
| S58  | S39 AND S56 Limiters - Exclude MEDLINE records                       | 238      |
| S57  | S39 AND S56                                                           | 1,028    |
| S56  | S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46 OR S47 OR S48 OR S49 OR S50 OR S51 OR S52 OR S53 OR S54 OR S55 | 520,599  |
| S55  | TI (epidemiologic N2 study) OR AB (epidemiologic N2 study)           | 771      |
| S54  | (MH "Epidemiological Research+")                                    | 18,674   |
| S53  | TI cross sectional OR AB cross sectional                            | 30,815   |
| S52  | (MH "Cross Sectional Studies")                                      | 53,850   |
| S51  | TI comparative study OR AB comparative study                         | 3,059    |

**Database**: Cinahl

**Date**: 08.03.2013

**Number of hits**: 238
|   | Description                                                                 | Count  |
|---|-----------------------------------------------------------------------------|--------|
| S50 | TI case control OR AB case control                                         | 8,418  |
| S49 | (MH "Case Control Studies+")                                              | 28,160 |
| S48 | TI (prospective N2 study) OR AB (prospective N2 study)                      | 25,692 |
| S47 | TI ( ((follow up or followup) N2 study) ) OR AB ( ((follow up or followup) N2 study) ) | 4,593  |
| S46 | TI ( (longitudinal* or observational or retrospective* or cohort*) ) OR AB ( (longitudinal* or observational or retrospective* or cohort*) ) | 101,654|
| S45 | (MH "Prospective Studies+")                                               | 141,998|
| S44 | TI (time N2 serie*) OR AB (time N2 serie*)                                  | 1,573  |
| S43 | (MH "Time Series")                                                         | 1,233  |
| S42 | TI ( (random* or control* or trial*) ) OR AB ( (random* or control* or trial*) ) | 273,184|
| S41 | PT clinical trial OR PT randomized controlled trial                         | 65,620 |
| S40 | (MH "Clinical Trials+")                                                    | 112,432|
| S39 | S12 AND S15 AND S22 AND S38                                                 | 3,513  |
| S38 | S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 | 432,691|
| S37 | TI ( ((intercultural* or multicultural* or cultural* or interethnic*) N5 (training or competen* or sensitivity or advocacy or course*)) ) OR AB ( ((intercultural* or multicultural* or cultural* or interethnic*) N5 (training or competen* or sensitivity or advocacy or course*)) ) | 3,702  |
| S36 | TI (matching N2 practice*) OR AB (matching N2 practice*)                    | 19     |
| S35 | TI ( ((staff* or employee or employed or hire* or hiring or engage*) N5 (minority or minorities or immigrant* or ethnic*)) ) OR AB ( ((staff* or employee or employed or hire* or hiring or engage*) N5 (minority or minorities or immigrant* or ethnic*)) ) | 315    |
| S34 | TI ( (second N2 language) and course* ) OR AB ( (second N2 language) and course* ) | 21     |
| S33 | TI ( (outreach N2 (target* or program*)) ) OR AB ( (outreach N2 (target* or program*)) ) | 712    |
| S32 | TI ( (parent* N2 (council or support)) ) OR AB ( (parent* N2 (council or support)) ) | 1,826  |
| S31 | TI ( ((link or social or support) N2 worker*) ) OR AB ( ((link or social or support) N2 worker*) ) OR (MH "Social Workers") | 10,458 |
| S30 | (MH "Cultural Competence") | 4,475 |
| S29 | (MH "Cultural Diversity") | 5,991 |
| S28 | (MH "Multilingualism") | 1,294 |
| S27 | TI ( (communicat* or informat* or interaction* or dialog* or conversation* or counsel?ing* or counselor* or consultation* or contact* or relation*) ) OR AB ( (communicat* or informat* or interaction* or dialog* or conversation* or counsel?ing* or counselor* or consultation* or contact* or relation*) ) | 325,676 |
| S26 | (MH "Professional-Family Relations") | 9,769 |
| S25 | (MH "Professional-Client Relations") | 3,326 |
| S24 | (MH "Counseling") | 12,154 |
| S23 | (MH "Communication+") | 111,336 |
| S22 | S16 OR S17 OR S18 OR S19 OR S20 OR S21 | 530,282 |
| S21 | TI ( (child or children or childhood or adolescen* or youth* or pediatric* or paediatric* or boy# or girl# or kid* or juvenil* or under#age* or teen* or minors* or pubescence* or young people or young person* or infant* or preschool* or pre-school* or toddler* or baby or babies or newborn* or neonate*) ) OR AB ( (child or children or childhood or adolescen* or youth* or pediatric* or paediatric* or boy# or girl# or kid* or juvenil* or under#age* or teen* or minors* or pubescence* or young people or young person* or infant* or preschool* or pre-school* or toddler* or baby or babies or newborn* or neonate*) ) | 274,933 |
| S20 | TI ( (family or families or parent*or father* or mother* or mum* or dad*) ) OR AB ( (family or families or parent*or father* or mother* or mum* or dad*) ) | 113,721 |
| S19 | (MH "Pediatrics+") | 6,258 |
| S18 | (MH "Adolescence+") | 183,729 |
| S17 | (MH "Child+") | 272,030 |
| S16 | (MH "Family+") | 96,492 |
| S15 | S13 OR S14 | 79,439 |
| S14 | TI ( (non native or nonnative or language or accent* or speak* or tongue*) ) OR AB ( (non native or nonnative or language or accent* or speak* or tongue*) ) | 38,777 |
| S13 | (MH "Language+") | 50,178 |
| S12 | S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 | 147,173 |
| S11 | TI ( (intercultural or cultural* or language) N2 (mediator* or broker* or care*)) ) OR AB ( (intercultural or cultural* or language) N2 (mediator* or broker* or care*)) ) | 2,225 |
| S10 | TI ( (multiling* or biling* or translat* or interpret* or multiculturalism*) ) OR AB ( (multiling* or biling* or translat* or interpret* or multiculturalism*) ) | 45,924 |
| S9 | (MH "Interpreter Services") OR (MH "Translations") | 4,086 |
| S8 | TI ( (foreign* or alien* or minority or minorities or ethnic* or asylum seek*) ) OR AB ( (foreign* or alien* or minority or minorities or ethnic* or asylum seek*) ) | 32,550 |
| S7 | (MH "Ethnic Groups+") | 64,644 |
| S6 | (MH "Minority Groups") | 5,856 |
| S5 | TI ( (migrant* or migrate* or transient*) ) OR AB ( (migrant* or migrate* or transient*) ) | 10,318 |
| S4 | (MH "Transients and Migrants") | 1,489 |
| S3 | TI ( (immigrant* or refugee* or immigrate* or emigrant* or emigrate*) ) OR AB ( (immigrant* or refugee* or immigrate* or emigrant* or emigrate*) ) | 6,288 |
| S2 | (MH "Refugees") | 2,875 |
| S1 | (MH "Emigration and Immigration") OR (MH "Immigrants+") | 8,702 |

**Database:** ISI Web of Science  
**Date:** 08.03.2013  
**Number of hits:** 1488
| #   | Results  | Query                                                                                           |
|-----|----------|------------------------------------------------------------------------------------------------|
| 28  | 17,652   | TS=((epidemiologic NEAR/2 study)) OR TI=((epidemiologic NEAR/2 study))                         |
| 27  | 150,068  | TS=(cross NEAR/2 sectional) OR TI=(cross NEAR/2 sectional)                                     |
| 26  | 115,262  | TS=(comparative NEAR/2 study) OR TI=(comparative NEAR/2 study)                                 |
| 25  | 177,994  | TS=((prospective NEAR/2 study)) OR TI=((prospective NEAR/2 study))                             |
| 24  | 41,219   | TS=((followup or “follow up”) NEAR/2 study) OR TI=((followup or “follow up”) NEAR/2 study)     |
| 23  | 776,099  | TS=((longitudinal* or observational or retrospective* or cohort*)) OR TI=((longitudinal* or observational or retrospective* or cohort*)) |
| 22  | 81,484   | TS=(time NEAR/2 serie*) OR TI=(time NEAR/2 serie*)                                              |
| 21  | 4,029,932| TS=((random* or control* or trial*)) OR TI=((random* or control* or trial*))                   |
| 20  | 5,185    | #19 AND #10 AND #7 AND #6                                                                    |
| 19  | 5,201,933| #18 OR #17 OR #16 OR #15 OR #14 OR #12 OR #11                                                 |
| 18  | 6,323    | TS=((intercultural* or multicultural* or cultural* or interethnic*) NEAR/5 (training or competen* or sensitivity or advocacy or course*)) OR TI=((intercultural* or multicultural* or cultural* or interethnic*) NEAR/5 (training or competen* or sensitivity or advocacy or course*)) |
| 17  | 437      | TS=((matching NEAR/2 practice*)) OR TI=((matching NEAR/2 practice*))                          |
| 16  | 1,384    | TS=((staff* or employee or employed or hire* or hiring or engage*) NEAR/5 (minority or minorities or immigrant* or ethnic*)) OR TI=((staff* or employee or employed or hire* or hiring or engage*) NEAR/5 (minority or minorities or immigrant* or ethnic*)) |
| 15  | 429      | TS=((second NEAR/2 language) and course*) OR TI=((second NEAR/2 language) and course*))        |
| #   | Term(s)                                                                 | TS Expression                                                                 |
|-----|------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| 14  | outreach NEAR/2 (target* or program*)                                  | TS=((outreach NEAR/2 (target* or program*))) OR TI=((outreach NEAR/2 (target* or program*))) |
| 13  | parent* NEAR/2 (council or support)                                    | TS=((parent* NEAR/2 (council or support))) OR TI=((parent* NEAR/2 (council or support))) |
| 12  | (link or social or support) NEAR/2 worker*                             | TS=(((link or social or support) NEAR/2 worker*)) OR TI=(((link or social or support) NEAR/2 worker*)) |
| 11  | communicat* or informat* or interaction* or dialog* or conversation*  | TS=((communicat* or informat* or interaction* or dialog* or conversation* or counseling* or counselling* or councelor* or consultation* or contact* or relation* or intervention*)) OR TI=((communicat* or informat* or interaction* or dialog* or conversation* or counseling* or counselling* or councelor* or consultation* or contact* or relation* or intervention*)) |
| 10  | family or families or parent* or father* or mother* or mum* or dad*    | TS=((family or families or parent* or father* or mother* or mum* or dad*)) OR TI=((family or families or parent* or father* or mother* or mum* or dad*)) |
| 9   | child or children or childhood or adolescent* or youth* or pediatric*  | TS=((child or children or childhood or adolescent* or youth* or pediatric* or paediatric* or boy* or girl* or kid* or juvenile* or "under age" or underage or teen* or minors* or pubescence* or "young people" or "young person" or infant* or preschool* or "pre-school" or toddler* or baby or babies or newborn* or neonate*)) OR TI=((child or children or childhood or adolescent* or youth* or pediatric* or paediatric* or boy* or girl* or kid* or juvenile* or "under age" or underage or teen* or minors* or pubescence* or "young people" or "young person" or infant* or preschool* or "pre-school" or toddler* or baby or babies or newborn* or neonate*)) |
| 8   | family or families or parent* or father* or mother* or mum* or dad*    | TS=((family or families or parent* or father* or mother* or mum* or dad*)) OR TI=((family or families or parent* or father* or mother* or mum* or dad*)) |
| 7   | non native or nonnative or language or accent* or speak* or tongue*    | TS=(("non native" or nonnative or language or accent* or speak* or tongue*)) OR TI=(("non native" or nonnative or language or accent* or speak* or tongue*)) |
| 6   | #5 OR #3 OR #2 OR #1                                                   |                                                                                   |
| 5   | intercultural or cultural* or language                                 | TS=(((intercultural or cultural* or language) NEAR/2 (mediator* or broker* or care*))) OR TI=(((intercultural or cultural* or language) NEAR/2 (mediator* or broker* or care*))) |
| 4   | multiling* or biling* or translat* or interpret*                      | TS=((multiling* or biling* or translat* or interpret*)) OR TI=((multiling* or biling* or translat* or interpret*)) |
|   |   |   |
|---|---|---|
| # 3 | 285,932 | TS=((foreign* or alien* or minority or minorities or ethnic* or “asylum seek*”)) OR TI=((foreign* or alien* or minority or minorities or ethnic* or “asylum seek*”)) |
| # 2 | 400,074 | TS=((migrant* or migrate* or transient*)) OR TI=((migrant* or migrate* or transient*)) |
| # 1 | 45,107 | TS=((immigrant* or refugee* or immigrate* or emigrant* or emigrate*)) OR TI=((immigrant* or refugee* or immigrate* or emigrant* or emigrate*)) |

**Database:** Bibsys  
**Date:** 07.01.2013 / 12.03.2013  
**Number of hits:** 511 / 181 / 309  
**Comment:** Three different searches in Bibsys generated many hits, among which many were irrelevant for the research question. The research librarian screened the results and picked out those that were irrelevant. These hits were saved in a different base and were passed to the project leader.

**Search 1 (511) 07.01.2013**

utvalgte felt = minoritet? eller utvalgte felt = minority eller utvalgte felt = minorities eller utvalgte felt = fremmed? eller utvalgte felt = flykting? eller utvalgte felt = asylum eller utvalgte felt = asyl? eller utvalgte felt = refugee? og utvalgte felt = fremmedspråk? eller utvalgte felt = non native? eller utvalgte felt = nonnative? eller utvalgte felt = språk? eller utvalgte felt = accent? eller utvalgte felt = aksent? eller utvalgte felt = tongue? eller utvalgte felt = morsmål? og utvalgte felt = communicat? eller utvalgte felt = kommunikasjon? eller utvalgte felt = dialog? eller utvalgte felt = contact? eller utvalgte felt = kontakt? eller utvalgte felt = relasjon eller utvalgte felt = relation? eller utvalgte felt = consulta? eller utvalgte felt = veileder? eller utvalgte felt = veiledning?

**Søk2 (181) 12.03.2013**

((bs.tittel-ord = "minoritet?") OR (bs.tittel-ord = "minority") OR (bs.tittel-ord = "minorities") OR (bs.tittel-ord = "fremmed?") OR (bs.tittel-ord = "flyktning?") OR (bs.tittel-ord = "asylum?") OR (bs.tittel-ord = "asyl?") OR (bs.tittel-ord = "refugee?") OR (bs.tittel-ord = "innvandr?") OR (bs.tittel-ord = "tolk?") OR (bs.tittel-ord = "broker?") OR (bs.tittel-ord = "interpret?")) AND ((bs.tittel-ord = "cultur?") OR (bs.tittel-ord = "kultur?") OR (bs.tittel-ord = "multikultur?") OR (bs.tittel-ord = "flierspråklig?") OR (bs.tittel-ord = "fremmedspråk?") OR (bs.tittel-ord = "etnisk?") OR (bs.tittel-ord = "ethnic?") OR (bs.tittel-ord = "tolk?") OR (bs.tittel-ord = "broker?") OR (bs.tittel-ord = "interpret?")) AND ((bs.tittel-ord = "møte?") OR (bs.tittel-ord = "meet?") OR (bs.tittel-ord = "counsel?") OR (bs.tittel-ord = "veiled?")))  

**Search3 (309) 07.01.2013**
utvalgte felt = innvandr? og utvalgte felt = møte?

**Database:** Social Care Online

**Date:** 07.03.2013

**Number of hits:** 276+262 (345 uten dubletter)

**Comments:** The search was divided due to large scope.

(Søk 1) /276

(freetext="immigrant*" Or freetext="immigrate*" Or freetext="emigra*" Or freetext="refugee" Or freetext="migrat*" Or freetext="migrant" Or freetext="transient*" Or freetext="foreign*" Or freetext="alien*" Or freetext="minorit*" Or freetext="ethnici*" Or freetext="asyl*") And (freetext="language*" Or freetext="non native" Or freetext="nonnative" Or freetext="accent*" Or freetext="speak" Or freetext="tongue*") And (freetext="family" or freetext="families" or freetext="child*" or freetext="youth" or freetext="boy*" or freetext="girl*" or freetext="juvenil*" freetext="teen*" or freetext="minor*" or freetext="young person*" or freetext="young people*" or freetext="pubescence*" or freetext="infant*" or freetext="preschool*" or freetext="preschool*" freetext="toddler*" freetext="baby*" or freetext="babies*" freetext="newborn*" or freetext="neonate*") And (freetext="communication*" or freetext="counseling*" or freetext="counselling*" or freetext="informat*" or freetext="interaction*" or freetext="dialog*" or freetext="conversat*" or freetext="counselor*" or freetext="consultation*" or freetext="relation*" or freetext="contact*" or freetext="social work*" or freetext="link work*" or freetext="support work*" or freetext="parent council*" or freetext="parent support*" or freetext="outreach target*" freetext="outreach program*" freetext="matching practice*")

(Søk 2)/262

(freetext="multilingual*" or freetext="bilingual*" or freetext="cultural*" or freetext="translat*" or freetext="interprett*" or freetext="intercultural*" freetext="multicultural*" or freetext="interethnic*") And (freetext="language*" Or freetext="non native" Or freetext="nonnative" Or freetext="accent*" Or freetext="speak" Or freetext="tongue*") And (freetext="family" or freetext="families" or freetext="child*" or freetext="boy*" or freetext="girl*" or freetext="juvenil*" freetext="teen*" or freetext="minor*" or freetext="young person*" or freetext="young people*" or freetext="pubescence*" or freetext="infant*" or freetext="preschool*" or freetext="pre-school*" freetext="toddler*" freetext="baby*" or freetext="babies*" freetext="newborn*" or freetext="neonate*") And (freetext="communication*" or freetext="counseling*" or freetext="counselling*" or freetext="informat*" or freetext="interaction*" or freetext="dialog*" or freetext="conversat*" or freetext="counselor*" or freetext="consultation*" or freetext="relation*" or freetext="contact*" or freetext="social work*" or freetext="link work*" or freetext="support work*" or freetext="parent council*" or freetext="parent support*" or freetext="outreach target*" freetext="outreach program*" freetext="matching practice*")
Database: ProQuest Eric
Date: 07.03.2013
Number of hits: 242+90 (308 without duplets)
Comment: The search was divided due to technical problems with the PQ-databases.

Søk 1 (242 treff)
(AB,TI(communicat* OR informat* OR interaction* OR dialog* OR counseling* OR councelor* OR consultation* OR contact* OR relation*)) AND
(SU.EXACT.EXPLODE("Language Minorities") OR SU.EXACT.EXPLODE("Immigrants") OR SU.EXACT.EXPLODE("Refugees") OR SU.EXACT.EXPLODE("Migrants") OR SU.EXACT.EXPLODE("Minority Groups") OR AB,TI(immigrant* OR refugee* OR immigrate* OR emigrant* OR emigrate* OR migrant* OR migrate* OR transient* OR minority OR minorities OR ethnic OR interethnic* OR asylum seek*)) AND
(SU.EXACT.EXPLODE("Linguistics") OR TI(non native OR nonnative OR language OR accent* OR speak* OR tongue*)) AND (AB,TI(random OR control OR trial* OR rct OR longitudinal* OR observational OR retrospective* OR prospective* OR cohort* OR comparative*) OR AB,TI(time NEAR/2 serie*) OR AB,TI("follow up" OR followup) OR AB,TI("case control") OR AB,TI("cross sectional") OR AB,TI(epidemiolog* NEAR/2 (study OR studies)))

Søk2 (90 treff)
(SU.EXACT("Multilingualism") OR SU.EXACT("Bilingualism") OR SU.EXACT("Translation") OR SU.EXACT.EXPLODE("Language Minorities") OR SU.EXACT.EXPLODE("Immigrants") OR SU.EXACT.EXPLODE("Refugees") OR SU.EXACT.EXPLODE("Migrants") OR SU.EXACT.EXPLODE("Minority Groups") OR AB,TI(multiling* OR biling* OR translat* OR interpret*) OR AB,TI((intercultural OR cultural* OR language) NEAR/2 (mediator* OR broker* OR care*)) OR AB,TI(immigrant* OR refugee* OR immigrate* OR emigrant* OR emigrate* OR migrant* OR migrate* OR transient* OR minority OR minorities OR ethnic OR interethnic* OR asylum seek*)) AND (SU.EXACT.EXPLODE("Linguistics") OR TI(non native OR nonnative OR language OR accent* OR speak* OR tongue*)) AND (SU("Cultural Pluralism") OR SU("Cultural Differences") OR SU("Cultural Education") OR SU("Cultural Literacy") OR SU("Social Work") OR TI(NEAR/2 (social OR support) NEAR/2 (worker*)) OR TI,AB(parent* NEAR/2 (council OR support)) OR AB,TI(outreach NEAR/2 (target* OR program*)) OR AB,TI((staff* OR employee OR employed OR hire* OR hiring OR engage*) NEAR/5 (minority OR minorities OR immigrant* OR ethnic*)) OR TI,AB(matching NEAR/2 (practice*)) OR TI,AB((intercultural* OR multicultural* OR cultural* OR interethnic*) NEAR/5 (training OR competen* OR sensitivity OR advocacy OR course*)) AND (AB,TI(random OR control OR trial* OR rct OR longitudinal* OR observational OR retrospective* OR prospective* OR cohort* OR comparative*) OR AB,TI(time NEAR/2 serie*) OR AB,TI("follow up" OR followup) OR AB,TI("case control") OR AB,TI("cross sectional") OR AB,TI(epidemiolog* NEAR/2 (study OR studies)))
Database: ProQuest SSA

Dato: 07.03.2013

Number of hits: 58+40 (82 without dupletts)

Comment: The search was divided because of technical problems with PQ-databases. Both search 1 and 2 were combined with filters (see below).

Search 1 (58 hits)

(SU.EXACT.EXPLODE("Ethnolinguistic Groups") OR SU.EXACT.EXPLODE("Immigrants") OR
SU.EXACT.EXPLODE("Undocumented Immigrants") OR SU.EXACT.EXPLODE("Refugees") OR
SU.EXACT("Emigration") OR SU.EXACT.EXPLODE("Migrants") OR SU.EXACT.EXPLODE("Ethnic Groups") OR SU.EXACT.EXPLODE("Ethnic Minorities") OR SU.EXACT.EXPLODE("Minority Groups") OR AB, TI(immigrant* OR refugee* OR immigrant* OR emigrant* OR emigrate* OR migrant* OR migrate* OR transient*) OR AB, TI(foreign* OR alien* OR minority OR minorities OR ethnic OR interethnic* OR asylum seek*)) AND

(SU.EXACT.EXPLODE("Language" OR "Language Varieties") OR AB, TI(non native OR nonnative OR language OR accent* OR speak* OR tongue*)) AND

(SU.EXACT.EXPLODE("Communication" OR "Computer Mediated Communication" OR "Intercultural Communication" OR "Interpersonal Communication" OR "Manual Communication" OR "Nonverbal Communication" OR "Verbal Communication") OR
SU.EXACT.EXPLODE("Counseling") OR SU.EXACT.EXPLODE("Crosscultural Treatment") OR AB, TI(communicat* OR informat* OR interaction* OR dialog* OR conversation* OR counseling* counselling* OR counselor* OR consultation* OR contact* OR relation*))

Search 2 (40 hits)

(AB, TI((link OR social OR support) NEAR/2 worker*) OR AB, TI(parent* NEAR/2 (council OR support)) OR AB, TI(outreach NEAR/2 (target* OR program*)) OR AB, TI((staff* OR employee OR employed OR hire* OR hiring OR engage*) NEAR/5 (minority OR minorities OR immigrant* OR ethnic*)) OR AB, TI(matching NEAR/2 practice*) OR AB, TI((intercultural* OR multicultural* OR cultural*) NEAR/2 (training OR competent* OR sensitivity OR advocacy OR course*)) OR SU.EXACT("Social Work") OR SU.EXACT.EXPLODE("Biculturalism") OR
SU.EXACT.EXPLODE("Cultural Pluralism") OR SU.EXACT.EXPLODE("Cultural Sensitivity") OR
SU.EXACT.EXPLODE("Cultural Relativism") OR SU.EXACT.EXPLODE("Multilinealism") OR
SU.EXACT.EXPLODE("Billingualism") OR SU.EXACT.EXPLODE("Translateion") OR AB, TI(translate* OR interpret*)) AND

(SU.EXACT.EXPLODE("Ethnolinguistic Groups") OR SU.EXACT.EXPLODE("Immigrants") OR
SU.EXACT.EXPLODE("Undocumented Immigrants") OR SU.EXACT.EXPLODE("Refugees") OR
SU.EXACT("Emigration") OR SU.EXACT.EXPLODE("Migrants") OR SU.EXACT.EXPLODE("Ethnic group") OR SU.EXACT.EXPLODE("Ethnic Minorities") OR SU.EXACT.EXPLODE("Minority Groups") OR AB, TI(immigrant* OR refugee* OR immigrant* OR emigrant* OR emigrate* OR migrant* OR migrate* OR transient*) OR AB, TI(foreign* OR alien* OR minority OR minorities OR ethnic OR interethnic* OR asylum seek*) OR AB, TI((multiline* OR billing* OR translate* OR interpret*) OR AB, TI((intercultural OR cultural* OR language) NEAR/2 (mediator* OR broker* OR care*))) AND (SU.EXACT.EXPLODE("Language") OR "Language"
Varieties") OR AB,TI(non native OR nonnative OR language OR accent* OR speak* OR tongue*)

Filter:
SU.EXACT.EXPLODE("Case Studies") OR SU.EXACT.EXPLODE("Time Series Analysis") OR
SU.EXACT.EXPLODE("Longitudinal Studies") OR SU.EXACT.EXPLODE("Cohort Analysis") OR
SU.EXACT.EXPLODE("Comparative Analysis") OR SU.EXACT.EXPLODE("Crosscultural Analysis") OR
SU.EXACT.EXPLODE("Observation") OR SU.EXACT.EXPLODE("Participant Observation") OR
AB(random or trial* or rct) OR AB((longitudinal* or observational or retrospective* or prospective* or cohort* or comparative*) N/3 (study or studies)) OR
AB(time N/2 serie*) OR AB("follow up" or followup) OR AB("case control") OR AB("cross sectional") OR AB(epidemiolog* N/2 (study or studies)) OR TI(random or trial* or rct) OR
TI((longitudinal* or observational or retrospective* or prospective* or cohort* or comparative*) N/3 (study or studies)) OR TI(time N/2 serie*) OR TI("follow up" or followup) OR
TI("case control") OR TI("cross sectional") or TI(epidemiolog* N/2 (study or studies))

Database: ProQuest SA
Date: 21.01.2013
Number of hits: 30+38+32+15 (104 uten dubletter)
Comments: Search was divided in several parts because of technical problems with PQ-bases. All searches were combined with filters (see below).

Search 1 (30 hits)
(SU.EXACT.EXPLODE("Immigrants") OR SU.EXACT.EXPLODE("Undocumented Immigrants") OR
SU.EXACT.EXPLODE("Refugees") OR SU.EXACT("Emigration") OR
SU.EXACT.EXPLODE("Migrants") OR SU.EXACT.EXPLODE("Ethnic Minorities") OR
SU.EXACT.EXPLODE("Minority Groups") OR SU.EXACT.EXPLODE("Multilingualism") OR
SU.EXACT.EXPLODE("Bilingualism") OR SU.EXACT.EXPLODE("Translation") OR
TI,AB(immigrant* OR refugee* OR immigrate* OR emigrant* OR emigrate* OR migrant* OR
migrate* OR transient*) OR TI,AB(minority OR minorities OR ethnic OR interethnic OR
"asylum seek") OR TI,AB(multiling* OR biling* OR translat* OR interpret*) OR TI,AB
((intercultural OR cultural* OR language) NEAR/2 (mediator* OR broker* OR care*)) AND
(SU.EXACT.EXPLODE("Language") OR SU.EXACT.EXPLODE("Language Varieties") OR
TI,AB("non native" OR nonnative OR language OR accent* OR speak* OR tongue*) OR
SU.EXACT.EXPLODE("Ethnolinguistic Groups") AND SU.EXACT.EXPLODE("Communication" OR
"Intercultural Communication" OR "Interpersonal Communication" OR "Manual Communication" OR "Nonverbal Communication" OR "Persuasion" OR "Verbal Communication") OR SU.EXACT.EXPLODE("Counseling") OR
SU.EXACT.EXPLODE("Crosscultural Treatment")

Search 2 (38 hits)
(SU.EXACT.EXPLODE("Immigrants") OR SU.EXACT.EXPLODE("Undocumented Immigrants") OR
SU.EXACT.EXPLODE("Refugees") OR SU.EXACT("Emigration") OR
SU.EXACT.EXPLODE("Migrants") OR SU.EXACT.EXPLODE("Ethnic Minorities") OR
SU.EXACT.EXPLODE("Minority Groups") OR SU.EXACT.EXPLODE("Multilingualism") OR
SU.EXACT.EXPLODE("Bilingualism") OR SU.EXACT.EXPLODE("Translation") OR
TI,AB(immigrant* OR refugee* OR immigrate* OR emigrant* OR emigrate* OR migrant* OR
migrate* OR transient*) OR TI,AB(minority OR minorities OR ethnic OR interethnic OR
"asylum seek*") OR TI,AB(multiling* OR biling* OR translat* OR interpret*) OR TI,AB
((intercultural OR cultural* OR language) NEAR/2 (mediator* OR broker* OR care*)) AND
(SU.EXACT.EXPLODE("Language") OR SU.EXACT.EXPLODE("Language Varieties") OR
TI,AB("non native" OR nonnative OR language OR accent* OR speak* OR tongue*) OR
SU.EXACT.EXPLODE("Ethnolinguistic Groups")) AND TI(communicat* OR informat* OR
interaction* OR dialog* OR conversation* OR counseling* counselling* OR councelor* OR
consultation* OR contact* OR relation*)

Search 3 (32 hits)
(SU.EXACT.EXPLODE("Immigrants") OR SU.EXACT.EXPLODE("Undocumented Immigrants")
OR SU.EXACT.EXPLODE("Refugees") OR SU.EXACT("Emigration") OR
SU.EXACT.EXPLODE("Migrants") OR SU.EXACT.EXPLODE("Ethnic Minorities") OR
SU.EXACT.EXPLODE("Minority Groups") OR SU.EXACT.EXPLODE("Multilingualism") OR
SU.EXACT.EXPLODE("Bilingualism") OR SU.EXACT.EXPLODE("Translation") OR
TI,AB(immigrant* OR refugee* OR immigrate* OR emigrant* OR emigrate* OR migrant* OR
migrate* OR transient*) OR TI,AB(minority OR minorities OR ethnic OR interethnic OR
"asylum seek*") OR TI,AB(multiling* OR biling* OR translat* OR interpret*) OR TI,AB
((intercultural OR cultural* OR language) NEAR/2 (mediator* OR broker* OR care*)) AND
(SU.EXACT.EXPLODE("Language") OR SU.EXACT.EXPLODE("Language Varieties") OR
TI,AB("non native" OR nonnative OR language OR accent* OR speak* OR tongue*) OR
SU.EXACT.EXPLODE("Ethnolinguistic Groups")) AND (SU.EXACT.EXPLODE("Biculturalism" OR
"Cultural Pluralism") OR SU.EXACT.EXPLODE("Cultural Sensitivity") OR
SU.EXACT.EXPLODE("Cultural Relativism"))

Search 4 (15 hits)
(SU.EXACT.EXPLODE("Immigrants") OR SU.EXACT.EXPLODE("Undocumented Immigrants")
OR SU.EXACT.EXPLODE("Refugees") OR SU.EXACT("Emigration") OR
SU.EXACT.EXPLODE("Migrants") OR SU.EXACT.EXPLODE("Ethnic Minorities") OR
SU.EXACT.EXPLODE("Minority Groups") OR SU.EXACT.EXPLODE("Multilingualism") OR
SU.EXACT.EXPLODE("Bilingualism") OR SU.EXACT.EXPLODE("Translation") OR
TI,AB(immigrant* OR refugee* OR immigrate* OR emigrant* OR emigrate* OR migrant* OR
migrate* OR transient*) OR TI,AB(minority OR minorities OR ethnic OR interethnic OR
"asylum seek") OR TI,AB(multiling* OR biling* OR translat* OR interpret*) OR TI,AB
((intercultural OR cultural* OR language) NEAR/2 (mediator* OR broker* OR care*)) AND
(SU.EXACT.EXPLODE("Language") OR SU.EXACT.EXPLODE("Language Varieties") OR
TI,AB("non native" OR nonnative OR language OR accent* OR speak* OR tongue*) OR
SU.EXACT.EXPLODE("Ethnolinguistic Groups")) AND TI,(link OR social OR support)
NEAR/2 worker*) OR (parent* NEAR/2 (council OR support)) OR TI,AB((staff* OR employee
OR employed OR hire* OR hiring OR engage*) NEAR/5 (minority OR minorities OR immigrant* OR ethnic*)) OR TI,AB(matching NEAR/2 practice*) OR TI,AB((intercultural* OR multicultural* OR cultural*) NEAR/5 (training OR competen* OR sensitivity OR advocacy OR course*)) TI,AB(outreach NEAR/2 (target* OR program*)))

Filter:
SU.EXACT.EXPLODE("Case Studies") OR SU.EXACT.EXPLODE("Time Series Analysis") OR SU.EXACT.EXPLODE("Longitudinal Studies") OR SU.EXACT.EXPLODE("Cohort Analysis") OR SU.EXACT.EXPLODE("Comparative Analysis") OR SU.EXACT.EXPLODE("Crosscultural Analysis") OR SU.EXACT.EXPLODE("Observation") OR SU.EXACT.EXPLODE("Participant Observation") OR AB(random or trial* or rct) OR AB((longitudinal* or observational or retrospective* or prospective* or cohort* or comparative*) N/3 (study or studies)) OR AB(time N/2 serie*) OR AB("follow up" or followup) OR AB("case control") OR AB("cross sectional") or AB(epidemiolog* N/2 (study or studies)) OR TI(random or trial* or rct) OR TI((longitudinal* or observational or retrospective* or prospective* or cohort* or comparative*) N/3 (study or studies)) OR TI(time N/2 serie*) OR TI("follow up" or followup) OR TI("case control") OR TI("cross sectional") or TI(epidemiolog* N/2 (study or studies))

**Database:** Google Scholar  
**Date:** 30.01.2013  
**Number of hits:** 200

(minorit* OR immigrat* OR emigra* OR asylum OR refugee*) AND (languag* OR communicat* OR broker* OR translat* OR linguistic* OR speak* OR tongue*) AND (famil* OR parent* OR mother* OR father*)

**Database:** OpenGREY  
**Date:** 30.01.2013  
**Number of hits:** 152

(minorit* OR immigrat* OR emigra* OR asylum OR refugee*) AND (languag* OR communicat* OR broker* OR translat* OR linguistic* OR speak* OR tongue*)
### APPENDIX 2 – EXCLUDED STUDIES

| Study: First author, year (ref. ID) | Reason for exclusion |
|----------------------------------|----------------------|
| *(Kultursen sitivitet - en balanseknst? : kultursensitivitet i møte med etniske minoritetsfamilier i barnevernet)* 30, 2010 n.f. (2010) | No study: bachelor thesis on cultural sensitivity, literature review |
| *(Aadnesen & Hurem, 2007)* Aadnesen 2007 (5069) | No study: textbook for bachelor students in child welfare and social work |
| *(Alfheim, 1992)* Alfheim 1992 (5653) | No study on the effect of interventions to facilitate communication |
| *(Arriaga & Longoria, 2011)* Arriaga 2011 | Non-eligible intervention: implementation intention intervention |
| *(Bakken, 1983)* Bakken 1983 (5474) | No effect study |
| *(Barkin, Gesell, Po’e, Escarfuller, & Tempesti, 2012)* Barkin 2012 (1203) | Non-eligible intervention |
| *(Barrio & Yamada, 2010)* Barrio 2010 (2248) | Non-eligible population: families with adult-children |
| *(Beeber, Lewis, Cooper, Maxwell, & Sandelowski, 2009)* Beeber 2009 | Non-eligible outcome: reduction av symptoms for depression (main outcome) |
| Reference                                    | Eligibility Notes                                      |
|---------------------------------------------|--------------------------------------------------------|
| (Bischoff et al., 2003) Bischoff 2003 (713) | Non-eligible population: adult patients (over 16 years of age). |
| (Bjørknes & Manger, 2012) Bjørknes og Manger (2012) | Non-eligible intervention and outcome |
| (Burmaz et al., 2007) Burmaz 2007 (1627)     | Non-eligible intervention and outcome |
| (Cunningham, Cushman, Akuete-Penn, & Meyer, 2008) Cunningham 2008 (588) | Non-eligible study design: cross-sectional study |
| (d' Ardenne, Ruaro, Cestari, Fakhoury, & Priebe, 2006) d'Ardenne 2007 (2012) | Non-eligible population: traumatized refugees |
| (Dorner, Orellana, & Li-Grining, 2007) Dorner 2007 (2532) | Non-eligible research question |
| (Ferguson & Candib, 2002) Ferguson 2002 (6117) | Non-eligible study design |
| (Flatebø, 1990) Flatebø 1990 (5710)         | No study |
| (Gany et al., 2007) Gany 2007 (466)          | Non-eligible population |
| (Gehri et al., 1999) Gehri 2009 (868)        | No study |
| (Gonzales et al., 2012) Gonzales 2012 (2108) | Non-eligible population and intervention |
| (Hagen & Qureshi, 1994) Hagen 1994 (5473)    | No study |
| (Harmsen et al., 2005) Harmsen 2005 (626)    | Non-eligible population |
| (Hendrickson, 2005) Hendrickson 2005 (597)   | Non-eligible intervention |
| Reference                                      | Type                          |
|------------------------------------------------|-------------------------------|
| (Hsu, Chen, & Huang, 2012) Hsu 2012 (1157)    | Non-eligible intervention     |
| (Ikeda, Pham, Nguyen, & Mitchell, 2002) Ikeda 2002 (789) | Non-eligible intervention     |
| (Jones et al., 2001) Jones 2001 (792)         | Non-eligible intervention     |
| (Kelly, Huffman, Mendoza, Robinson, & Greenberg, 2003) Kelly 2003 762 | Non-eligible intervention     |
| (LLOYD, 2006) Lloyd 2006 (6116)                | No study                      |
| (Locatis et al., 2010) Locatis 2010 (315)      | Non-eligible population       |
| (Madar, Klepp, & Meyer, 2011) Madar 2011 (191) | Non-eligible intervention     |
| (Martinez & Eddy, 2005) Martinez 2005 (2628)  | Non-eligible intervention     |
| (Mazor, Hampers, Chande, & Krug, 2002) Mazor 2002 (1816) | Non-eligible study design    |
| (Prado et al., 2007) Prado 2007 (2390)         | Non-eligible intervention     |
| (Preyde, 2007) Preyde 2007 (492)              | Non-eligible population       |
| (Reavy, Hobbs, Hereford, & Crosby, 2012) Reavy 2012 (75) | Non-eligible study design    |
| (menn, 2009) Ressurscenter (2010) (5689)       | Non-eligible study design     |
| (Rossiter, 1994) Rossiter 1994 (997)           | Non-eligible intervention     |
| (Rowe & Spees, 1987) Rowe 1987 (1084)          | Non-eligible study design     |
| Reference | Type of Non-Eligibility |
|-----------|------------------------|
| (Scheinmann, Chiasson, Hartel, & Rosenberg, 2010) Scheinmann 2010 (231) | Non-eligible intervention |
| (Schenker, Perez-Stable, Nickleach, & Karliner, 2011) Schenker 2011 (279) | Non-eligible population |
| (Sommerstein, 1989) Sommerstein 1988 (5475) | No study |
| (Søderstrøm, Kittelsaa, & Berg, 2011) Søderstrøm 2011 (4960) | Non-eligible study design |
| (Sørheim, 2000) Sørheim 2000 (5568) | Non-eligible study design |
| (Taylor, Serrano, Anderson, & Kendall, 2000) Taylor 2000 (849) | Non-eligible intervention |
| (Thompson et al., 2012) Thompson 2002 (1162) | Non-eligible intervention |
| (Washington, Stafford, Stomsvik, & Giannini, 1983) Washington 1983 (3294) | Non-eligible intervention |
| (Younas & Tabasam, 2009) Younas 2009 (6106) | Non-eligible study design |
| (Zúñiga de Nuncio et al., 2003) Zuniga 2003 (3183) | Non-eligible intervention |
## Risk of Bias Assessment of the Included Studies

| Study First Author (year) | Selection Bias | Performance Bias | Detection Bias | Attrition Bias | Reporting Bias | Other Sources of Bias | Overall RoB |
|--------------------------|----------------|------------------|---------------|---------------|---------------|----------------------|-------------|
| Crossman 2010            | High           | High             | Low           | Unclear       | Low           | Low                  | High RoB    |
|                          | inadequate generation of a randomized sequence ("calendar day randomization") |                |               |               |               |                      |             |
| Garcia 2004              | Low            | Unclear          | Unclear       | Unclear       | Low           | Non                 | Unclear RoB |
| Hornberger 1996          | High           | Unclear          | Low           | Low           | High          | Low                  | High RoB    |
| Waterman 2008            | Unclear        | Unclear          | High          | High          | Low           | High                 | High RoB    |
| Domain                  | Evaluation | Description                                                                                                                                                                                                 |
|------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| **Selection bias**     |            |                                                                                                                                                                                                             |
| Random sequence generation | High RoB  | Selection bias (biased allocation to interventions) due to inadequate generation of a randomized sequence. Families not seen by a bilingual provider on an enrolment day, were randomly assigned to either the in-person or telephonic-interpreter arms on the basis of a calendar-day randomization. |
| Allocation concealment | High RoB   | Selection bias (biased allocation to interventions) due to inadequate concealment of allocation prior to assignment.                                                                                           |
| **Performance bias**   |            |                                                                                                                                                                                                             |
| Blinding of participants | High RoB  | Participants cannot be blinded                                                                                                                                                                           |
| **Detection bias**     |            |                                                                                                                                                                                                             |
| Blinding of outcome assessment/assessors | Unclear RoB | “Investigators were blinded to the cohort assignment when making these determination”. E633”.                                                                                                              |
| **Attrition bias**     | Low RoB    | “no refusals and no exclusion” (e633)                                                                                                                                                                    |
| Incomplete outcome data |            |                                                                                                                                                                                                             |
| Reporting bias       |          |
|----------------------|----------|
| Selective reporting  | Low RoB  |

| Other bias          |          |
|---------------------|----------|
| Unclear RoB         |          |
|                     | Individuals belonging to the group allocated to bilingual physician was not randomized. |
|                     | Lower RoB for the following comparisons: |
|                     | Telephone interpreter vs. in-person interpreter |

| Overall RoB         | High RoB |
|---------------------|----------|
| Study Design | Garcia et al. (2004) |
|-------------|---------------------|
| Design      | Randomized controlled trial (RCT) |

| Domain       | Evaluation | Description |
|--------------|------------|-------------|
| **Selection bias** |
| Random sequence generation | Low RoB | |
| Allocation concealment | Unclear RoB | “Randomization was by selection of sealed envelopes” (374) |
| **Performance bias** |
| Blinding of participants | Unclear RoB | Not mentionned |
| **Detection bias** |
| Blinding of outcome assessment/assessors | Unclear RoB | Not mentionned |
| **Attrition bias** |
| Incomplete outcome data | Unclear RoB | Unclear how many completed questionnaire |
| **Reporting bias** |
| Selective reporting | Low RoB | unlikely |
| **Other bias** |
| Overall RoB | Unclear |
| Domain                     | Evaluation | Description                                                                                                                                                                                                 |
|---------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| **Selection bias**        |            |                                                                                                             |
| Random sequence generation | High RoB   | “We alternated the use of the control or experimental service at each subsequent visit at 2 weeks, 2 months, 4 months, and 6 months” (p.2)                                |
| Allocation concealment    | Unclear RoB|                                                                                                             |
| **Performance bias**      |            |                                                                                                             |
| Blinding of participants  | Low RoB    | “it was not possible to mask “the subjects to the type of service they used. However, they neither were told the goals of the study nor its major conclusion” (s.7) |
| **Detection bias**        |            |                                                                                                             |
| Blinding of outcome       | Low RoB    | “Coders were not informed about the goals of the study, the major endpoints, or the treatment assignments.” (s.7).                                                                                   |
| Blinding of outcome       | Low RoB    |                                                                                                             |
| Assessment/assessors      |            |                                                                                                             |
| **Attrition bias**        |            |                                                                                                             |
| Incomplete outcome data   | High RoB   | Attrition bias due to amount, nature or handling of incomplete outcome data.                                                                                                                                   |
| **Reporting bias**        |            |                                                                                                             |
|                      | Low RoB   | Unclear                                           | Could be other reasons that mothers were satisfied or not |
|----------------------|-----------|---------------------------------------------------|----------------------------------------------------------|
| Selective reporting  | Low RoB   |                                                   |                                                          |
| **Other bias**       | Unclear   |                                                   |                                                          |
| Overall RoB          | High RoB  |                                                   |                                                          |
| Domain             | Evaluation | Description                                           |
|--------------------|------------|-------------------------------------------------------|
| Selection bias     |            |                                                      |
| Random sequence generation | Unclear RoB | Cluster randomization; no more information           |
| Allocation concealment | Unclear RoB | Not mentioned                                         |
| Performance bias   |            |                                                      |
| Blinding of participants | Unclear RoB | Not mentioned                                         |
| Detection bias     |            |                                                      |
| Blinding of outcome assessment/assessors | High RoB | Outcome assessor the same person as the author.        |
| Attrition bias     |            |                                                      |
| Incomplete outcome data | High RoB | Quite high attrition                                  |
| Reporting bias     |            |                                                      |
| Selective reporting | Low RoB    |                                                      |
| Other bias         |            |                                                      |
| High RoB | Cluster randomization; cluster randomization effect was not taken into account. |

**Overall RoB**
### 7.4 APPENDIX 3 – DATA EXTRACTION OF INCLUDED STUDIES

| Study: Main author year (RefID) | Crossman 2010 (31) |
|--------------------------------|-------------------|
| Quality assessment             | High RoB (for two domains) |
| Study description              | Setting: Children’s Hospital, Denver, Colorado, Emergency department |
|                                | Land: USA |
|                                | Aim as described by the author: “To compare the efficacy of telephonic and in-person medical interpretation to visits with verified bilingual physicians” (as stated in the abstract) |
|                                | Hypothesis: “We hypothesized that families with LEP would differ on objective measures of understanding of the provider’s diagnosis as well as qualitative indicators of satisfaction with that provider’s care based on the type of language service modality used.” (e632). |
|                                | Study design: Non-equivalent controlled design: two groups were randomly assigned to either the in-person or telephonic-interpreter arm based on a calendar-day randomization. In addition, a group of families with LEP who presented on enrollment days managed by a verified bilingual physician was considered in the comparison. “prospective randomized trial” (e631) |
|                                | Inclusion period: “Patients were interviewed immediately after their ED visit or before transfer to their inpatient bed by a Spanish-speaking research assistant.” (e633) |
|                                | (year start-year end: not reported) |
| Intervention                   | Mean / median /minimum / max period of follow-up: - |
| In-person interpreter (N=377)  | |
| Description                    | “In-person interpreter days, interpretation was provided by an ED-dedicated, Spanish-language-speaking, Peruvian medical interpreter who was available promptly by activating a portable communication device” (e632) |
| Comparison 1                   | “Telephonic service” (sequential), N=407 |
| Description                    | “Telephonic services were provided by a proprietary service, CyraCom International, Inc (Tucson, AZ). This service provides double-headset telephones and interpretation in multiple languages with a single-touch button for Spanish. The dual-handset interpreter telephones were placed in triage as well as in all patient care rooms in the ED.” (e632) |
| Comparison 2                   | “Verified bilingual physician”, N=417 |
|                                | Families seen by a bilingual physician communicated directly with their provider. |
Description: “Each bilingual provider’s language skills were verified by the ED’s professional interpreter during formal audits of their Spanish-language skills during actual patient interviews. No providers classified as “bilingual” failed these voluntary audits.” (e633).

Population demographics

| Age: Median (range) age (mo) | In-Person: 23.9 (0-244); Telephonic: 22.2 (=0-225); Bilingual: 28.9 (0-216) |
| Sex:                        | In-Person translator: female: 45.6 %; male 54.4 % |
|                            | Telephonic interpretation: female: 46.9 %; male: 53.1 % |
|                            | Bilingual: female: 46.3 %; male: 53.7 % |

Country of origin of parent

US, n (%): 1 (%)  
Mexico, n (%): 348 (92)  
Other Latin American countries, n (%): 28 (7)

Telephonic:  
US, n (%): 4 (1 %)  
Mexico, n (%): 379 (93)  
Other Latin American countries, n (%): 24 (6)

Bilingual:  
US, n (%): 5 (1)  
Mexico, n (%): 377 (90)  
Other Latin American countries, n (%): 35 (9)

Method (described in study)

Criteria for inclusion: Families presented to the Children’s Hospital, Denver emergency department, with limited English proficiency.

Criteria for exclusion: 'Families were subsequently excluded if the patient presented for a psychiatric evaluation or a suspicion of child abuse existed.’ (e632).

Sampling: randomisering av aktuelle deltakere i to grupper; ikke-randomisering av gruppen som ble tildelt ‘bilingual provider’.

Data collection: "Participants were interviewed immediately after their ED visit before transfer to their inpatient bed by a Spanish-speaking research assistant. Questions were administered verbally to avoid bias caused by literacy issues”. (e633).

Study participants were asked in Spanish to rank the following items on a 4-point scale (1, excellent, 2, good, 3, fair, 4, poor).

Words understood: “Did the physician speak in words that you understood?”

Satisfaction with physician: “How satisfied were you with your provider?”

Overall satisfaction: “What was your overall satisfaction with the visit?” (pe366)

Results

| Question/outcome   | N | Median Score (Range) | Excellent/good score (in %) |
|--------------------|---|----------------------|-----------------------------|
| Words understood   |   |                      |                             |
In-person 375 2 (1-3) 372 (98.7)  
bilingual 415 1 (1-3) 404 (96.9)  
total 1201

Satisfaction with physician

|                  | telephonic | In-person | bilingual | total    |
|------------------|------------|-----------|-----------|----------|
| telephonic       | 407 (1-3)  | 399 (98.0)|          | 1199     |
| In-person        | 375 (2-3)  | 370 (98.7)|          |          |
| bilingual        | 417 (1-3)  | 405 (97.1)|          |          |

Overall satisfaction

|                  | telephonic | In-person | bilingual | total    |
|------------------|------------|-----------|-----------|----------|
| telephonic       | 407 (1-4)  | 366 (89.9)|          | 1199     |
| In-person        | 375 (2-4)  | 338 (90.2)|          |          |
| bilingual        | 417 (1-4)  | 373 (89.4)|          |          |

# Not all families answered every question. 4-point Likert scale ranging from 1=excellent, 2=good, 3=fair to 4=poor

*Kilde: Crossman et al. (2010), p. e634.*

For the questions ‘Did the physician speak in words that you understood?’, ‘How satisfied were you with your provider?’, ‘What was your overall satisfaction with the visit?’ participants in the in-person cohort scored their visit worse than in the bilingual and telephonic cohorts (p<.001).

Concordance results: ‘The families’ reports of their children’s diagnosis were compared with the discharge diagnosis recorded in the medical record. There were no statistically significant differences across the cohorts: 95.1 % of families in the telephonic-interpreter arm, 95.5 % of families in the in-person-interpreter arm, and 95.4% of families seen by a bilingual physician accurately reported on their discharge diagnosis.” (e634).

*Drop-out: ingen rapportert.*

*Drop-out analysis: ikke-relevant*

**Comments**

Author’s conclusion: “Professional interpreters can ensure that adequate communication takes place between a provider and a family. The type of interpreter modality used may not be as important as the fact that one is being used. Although our study detected no differences in the objective outcomes studied, more work is needed to examine what unmeasured differences may exist. In addition, the relative differences in duration of interpretation, manpower allocation...
issues, and overall cost effects of these methods of interpretation demand further investigation.”

| Study/ Main author (år) | Garcia (2004) |
|-------------------------|---------------|
| **Study quality rating** | Unclear RoB |

| Study description | Setting: | Children’s Medical Center in Dallas, Texas |
|-------------------|----------|------------------------------------------|
|                  | Land:    | USA                                      |

**Aim as described in the study:** “To determine whether mode of interpretation influences satisfaction of limited English-proficient parents presenting to a tertiary care pediatric emergency department”. (p.373)

**Hypothesis as described:** -

**Study design:** Randomized controlled study

**Inclusion period (year start-year end):** mai 2000 – juni 2001

**Mean / median/minimum / max period of follow-up:** -

| Intervention | Type: | Hospital-trained interpreters, offered as part of normal hospital service (N=60) |
|--------------|-------|----------------------------------------------------------------------------------|
| Description: | "Hospital-trained interpreters required to demonstrate fluent Spanish and English skills by scoring 85 % or greater on a screening language test, are trained in medical Spanish and interpretation techniques, and are required to undergo ongoing education and testing” (p. 374). |

**Comparison 1**

| Type: | Telephone interpreters (N=60). |
|-------|---------------------------------|
| Description | "Telephone interpreters … provided by a national available service, and interpretation was simultaneous by speakerphone when possible” (p.374). |

**Comparison 2**

| Type: | Ad hoc interpreter (N=60) |
|-------|----------------------------|
| Description | "…consist of anyone within the hospital setting, including family members who act as interpreters but have no formal training or testing of fluency. If an ad hoc envelope was selected and a family member or friend wished to interpret, they were allowed to do so; otherwise, most of the interpretation was by the selected method” (374) |

| Population characteristics | Population defined as ‘families presenting to the pediatric emergency referral center at Children’s Medical Center who were in need of language assistance.’ (p.374). |
Most of the children were born in the US [n=197 (86%)], while mothers and fathers emigrated predominantly from Mexico [n=164 (69%) and n=169 (72%), respectively].

14% of mothers (n=31) and 13% of fathers (n=29) stated that their child was born outside the US.

Table 3. One-Way Analysis of Variance of Selected Demographic Characteristics

| Interpreter Type | Adhoc | Hospital Training | Telephone | None |
|------------------|-------|-------------------|-----------|------|
|                  | N     | Mean (SD)         | N         | Mean (SD) | N     | Mean (SD) | N   | Mean (SD) |
| Mother's age     |       |                   |           |         |       |           |     |           |
|                  | 51    | 28 (5.1)          | 53        | 27 (7.0) | 57    | 27 (7.3)  | 34  | 29 (7.4)  |
| Father's age     |       |                   |           |         |       |           |     |           |
|                  | 50    | 31 (7.1)          | 52        | 30 (7.8) | 56    | 31 (8.0)  | 51  | 31 (6.9)  |
| Child's age      |       |                   |           |         |       |           |     |           |
|                  | 53    | 3 (4.5)           | 58        | 3 (4.3)  | 54    | 3 (3.0)   | 59  | 5 (4.7)   |

Table 5. Summary of Selected Demographic Characteristics

| Interpreter Type | Adhoc | Hospital Training | Telephone |
|------------------|-------|-------------------|-----------|
|                  | N     | %                 | N         | %     |
| Income (P<0.001) |       |                   |           |       |
| < than US$ 10,000/y | 23    | 40.4              | 33        | 56.9  | 30    | 51.7    |
| US$ 10,000/y to less than US$ 20,000/y | 29    | 50.9              | 20        | 34.5  | 24    | 41.4    |
| US$ 20,000/y plus | 5     | 8.8               | 5         | 8.6   | 4     | 6.9     |
| Education (P<0.001) |       |                   |           |       |
| Less than high school | 23    | 38.3              | 29        | 48.3  | 34    | 57.6    |
| High school graduate | 32    | 53.3              | 24        | 40.0  | 18    | 30.5    |
| More than high school | 5     | 8.3               | 7         | 11.7  | 7     | 11.9    |
Method

**Inclusion criteria**

“All families presenting to the pediatric emergency referral center at Children’s Medical Center who were in need of language assistance.” (p. 374)

**Criteria for exclusion**

Non-reported

**Sampling**

“Parents were randomly assigned to receive interpretation services by 1 of 3 currently employed methods: hospital-trained interpreters, ad hoc interpreters, or telephone interpreters. Randomization was by selection of sealed envelopes for each group assured an equal number of participants from each group.” (p. 374).

**Data collection**

‘Satisfaction with interpreters,’:

Physician Satisfaction Index:
Physician satisfaction was “measured by a summative index of 5 items, …that measured varying levels of satisfaction
1) Made me feel confident in his/her ability
2) Overall, I was satisfied with doctor
3) Took my child’s problem seriously
4) Spent sufficient time with my child
5) Listened to what I had to say about my child

Nurse Satisfaction Index:
Nurse satisfaction was “measured by a summative index of 5 items, …that measured varying levels of satisfaction
1) Overall I was satisfied with nurse
2) Made me feel confident in their ability
3) Took my child’s problem seriously
4) Spent sufficient time with my child
5) Listened to what I had to say about my child

Overall satisfaction

Ability to communicate: Parent’s self-rating of their ability to communicate with hospital staff was measured by a single item measured by a 4 point-Likert scale where 4 equals “strongly agree” and 1 “strongly disagree”.

**Drop out analysis**

Non-reported

**Results**

Primary outcome: satisfaction with interpreter, ability to communicate

| Interpreter type | None (1) Mean (SD) | Translator (2) Mean (SD) | Ad hoc (3) Mean (SD) | Telephone (4) Mean (SD) | Anova F | P | Post hoc* |
|------------------|--------------------|--------------------------|----------------------|-------------------------|---------|---|---------|

Source: Garcia (2004), p.375.
|                      | Physician satisfaction | Nursing satisfaction | Ability to communicate | Overall visit satisfaction |
|----------------------|------------------------|----------------------|------------------------|---------------------------|
|                      | 87 (16.9)              | 86 (19.4)            | 89 (17.9)              | 89 (16.8)                 |
|                      | 96 (8.7)               | 89 (13.2)            | 78 (17.1)              | 79 (16.2)                 |
|                      | 83 (15.6)              | 77 (15.4)            | 71 (23.0)              | 72 (17.2)                 |
|                      | 81 (16.4)              | 89 (15.4)            | 63 (18.7)              | 74 (15.3)                 |
|                      | 11.56                  | 8.88                 | 20.66                  | 13.91                     |
|                      | <0.001                 | <0.001               | <0.001                 | <0.001                    |
|                      | 1,3,4<2                | 3,4                  | <1,2                   | 2,3,4<1                   |
|                      |                        |                      |                        |                           |

The numbers in parentheses in column heads refer to the numbers used for illustrating significant differences in the last column titled “Post hoc”.

*Either Tukey HSD or Tamhane multiple comparison corrections were used as appropriate for the data.

Source: Garcia, p. 376.

**Comment**

Main conclusion as given by main author: “It is apparent from this research that trained interpreters are a valuable and needed resource for hospitals throughout the country and are the ideal way of providing interpreters to LEP parents. While it may be impossible to train and provide interpreters for every language and dialect, it seems logical to identify the most frequently spoken languages at individual institutions and aim to provide these services. …. If professional interpreters are not available, other interpreters including telephone and ad hoc interpreters should be used, as long as the limitations are understood.” (p.606).
| Study: Main author year (RefID) | Hornberger 1996 (3164) |
|---------------------------------|-----------------------|
| Study quality (RoB)             | High RoB              |
| Study description               | Setting: Well-baby Clinic of the Santa Clara Valley Medical Centre, North Carolina, USA |
|                                 | **Country**: USA      |
|                                 | Aim described by the study authors: "A new language service was developed in which interpreters are trained in the skills of simultaneous interpretation commonly used at international conferences. The interpreters are linked from a remote site to headsets worn by the clinician and patient through standard communication wires. [...] The aim of this study is to assess in a randomized protocol the quality of communication, interpretation, and level of patient, interpreter, and physician satisfaction with these two language services." (p.845) |
|                                 | Study hypothesis: not reported |
|                                 | Study design: quasi-randomised controlled trial |
|                                 | **Inclusion period: not reported** |
|                                 | **Mean / median /minimum / max period of follow-up: -** |
| Intervention                    | 'remote-simultaneous interpretation' |
|                                 | Description: "We equipped the examination room with two headsets, one each for the mother and the physician. Each headset included a receiver and microphone. In a separate room, located approximately 100 meters from the examination room, an interpreter had a similar headset and a control panel electronically linking all headsets. The interpreter could choose to hear the mother's and physician's voices simultaneously or, by turning on a switch on the control panel, could hear each voice alone. With another switch, the interpreter could similarly control what the mother or the physician heard. When the interpreter heard the physician speaking, the physician's utterances were interpreted simultaneously to the mother. As in usual simultaneous-conference interpretation, the interpreter began the interpretation even while the physician was speaking. When the mother responded, the interpreter reversed the process through use of the control panel. The headsets of the physician and mother muffled the voice of the other party so that they heard the interpreted phrases in their own language only and not the voices of each other." (p.3) |
| Comparison 1                    | 'proximate-consecutive interpretation' |
|                                 | Description: 'Control visits had an interpreter in the room performing proximate-consecutive interpretation. Specifically, the physician paged the interpreter to the clinic. The interpreter stood or sat near the patient in the examination room. The physician directed comments in English to the interpreter, who then repeated them to the patient in Spanish in third-person tense. The patients also directed comments in Spanish to the interpreter, who repeated them to the physician in English in third-person tense. Typically only one person would speak at a time.' (p. 2) |
| Comparison 2                    | -                      |
|                                 | -                      |

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Demographics of population

Age: not reported

Spanish speaking mothers (N=59)

Method reported in study

Criteria for inclusion: ‘Mothers who spoke only Spanish and were in the hospital for delivery of a baby.’ (p.2)

Criteria for exclusion: -

Sampling: "We randomly assigned the first well-baby visit to the control or experimental service. We alternated the use of the control or experimental service at each subsequent visit at 2 weeks, 2 months, 4 months, and 6 months." (s.2)

Data collection: The authors of the study reported that they ‘…tape-recorded each encounter to assess the duration of the visit, the quality of the medical discourse, and the accuracy of interpretation. Three native Spanish speakers who spoke fluent English were recruited to code audiotapes. They underwent 10 hours of supervised training in the coding methodology. They were not coached as to one methodology being favored over another nor told the type of interpretation used in the visits or the goals or endpoints of the study.’

First session:
Utterances spoken by the mother were coded as ‘questions’ (referring to mother’s utterances about the baby) ‘explanations’ (referring to the mother’s utterances in response to questions) and ‘requests for clarity’ (referring to mother’s utterances to better understand the physician’s comments).

Second sessions: Coders listened to audiotapes to assess the accuracy of the intervention, based on a system developed by Barik.
The recorded whether mother utterance was interpreted correctly or was an ‘addition’, ‘omission’ or ‘substitution’. (p.3)

Results

| Type of utterance | Control | Experimental | Model 1 | Model 2 |
|-------------------|---------|--------------|---------|---------|
| Mothers           |         |              |         |         |
| Questions         | 3.1     | 3.6          | 4.3 (3.8, 4.9) | 0.9 (-1.1, 2.9) |
| Explanations      | 34.2    | 43.7         | 7.4 (4.7, 10.1) | 9.9 (1.8, 18.0) |
| Requests for clarity | 0.3     | 0.7          | 3.4 (3.2) | 0.6 (0.1, 1.1) |
| Total             | 37.6    | 48.0         | 9.1 (6.1, 12.1) | 11.4 (2.4, 20.4) |

|               | Number of utterances<sup>a</sup> | Difference in Number of utterances<sup>b</sup> |
|---------------|---------------------------------|---------------------------------------------|
| Type of utterance | Control | Experimental | Model 1<sup>c</sup> | Model 2<sup>d</sup> |
| Mothers       |         |              |         |         |
| Questions     | 3.1     | 3.6          | 4.3 (3.8, 4.9) | 0.9 (-1.1, 2.9) |
| Explanations  | 34.2    | 43.7         | 7.4 (4.7, 10.1) | 9.9 (1.8, 18.0) |
| Requests for clarity | 0.3     | 0.7          | 3.4 (3.2) | 0.6 (0.1, 1.1) |
| Total         | 37.6    | 48.0         | 9.1 (6.1, 12.1) | 11.4 (2.4, 20.4) |

<sup>a</sup> Mean number of utterances in first and second visits (standard error; n=35 control visits; n=36 experimental visits)

<sup>b</sup> Mean estimated difference between utterances per experimental visit and control visit (95% confidence interval)

<sup>c</sup> Mean difference calculated using data from first and second visits (i.e., D in Equation 1)
**Kilde:** Table 2: Number of Mothers Utterances per Visit. Hornberger (1996), p. 6.

| Type of utterance | % Inaccurate Utterancesa | Difference in % of Inaccurate utterancesb | Model 1c | Model 2d |
|-------------------|--------------------------|-----------------------------------------|---------|---------|
| Mothers           |                          |                                         |         |         |
| Additions         | 2.3                      | 1.6                                     | 0.2 (-0.6, 0.9) | 0.1 (-2.0, 2.2) |
| Omissions         | 14.9                     | 9.1                                     | -2.8 (-3.6, -1.9) | -5.1 (-11.1, 0.8) |
| Substitutions     | 5.7                      | 6.4                                     | 0.9 (-0.3, 2.1)  | 0.8 (-2.7, 4.3)  |
| Total             | 22.9                     | 17.1                                    | -3.0 (-5.4, -0.6) | -4.2 (-11.3, 2.8) |

a Percent of utterances in first and second visits (standard error; n=35 control visits; n=36 experimental visits)
b Estimated percent difference between utterances per experimental visit and control visit (95% confidence interval)
c Percent difference calculated using data from first and second visits (i.e., D in Equation 1)
d Percent difference calculated using data only from first visits.

Kilde: Table 3: Accuracy of Interpretation. Hornberger (1996), p. 6.

**Drop-out: N=9**

Drop-out analysis: ikke-rapportert.

**Comments**
Main conclusion give by the main author: ‘...we found that patients [...] significantly preferred the new method of delivering languagee services [remote-simultaneous interpretation] to the control method [proximate-consecutive interpretation]. We achieved significant endpoints despite some ambivalence by the interpreter about their role with remote-simultaneous interpretation. Our study suggests that remote-simultaneous interpretation may be an acceptable, and perhaps a preferred, alternative language service when a same-language encounter is unfeasible.’ (p.7).
| **Study: Main author year (RefID)** | Waterman 2008 (94) |
|-----------------------------------|-------------------|
| **Quality assessment RoB**        | High RoB          |
| **Study description**             | Setting: English-as a Second Language Classes; Altura School District (ASD), (pseudonym), a large urban school district in Colorado; Elementary schools in ASD offering ESL classes. |
| **Country:**                      | USA               |
| **Aim as described in the article:** | ‘…the main purpose of the study is examining the influence of integrating authentic parent-involvement goals into school-based adult ESL-classes.” (p.228) |
| **Hypothesis as described in the article:** | “…I examine the, hypothesis that school-based adult ESL classes intentionally focused on English-language acquisition and parent involvement could yield an increase in both ESL and parent-involvement skills, simultaneously and synergistically [...] In this article, I will focus on findings pertaining to the ways that school-based adult ESL classes could support meaningful parent-school collaboration.” (p.228f.) |
| **Study design:**                 | cluster-randomized study |
| **Inclusion period:**             | 2004-2005 [information given by (R. A. Waterman, 2008)] |
| **Intervention**                  | English as a Second Language adult classes |
| **Description**                   | ‘English as a Second Language adult classes as a way to support parental involvement, in spite of the dominant influence of language barriers.’ (p.228) |
| **Comparison**                    | Alternative English as a Second Language classes |
| **Comparison**                    | ‘Similar to many adult ESL classes offered in public schools with primary focus on English-language acquisition. In most cases, skills in English were taught as isolated skills, such as word lists and specific grammatical concepts.’ (p.231) |
| **Population demographics**       | Age: Average age: 32.2 years |
|                                   | Sex: mothers with Mexican origin |
|                                   | SES: Low SES, low income |
|                                   | Average amount of formal education: 6th grade |
|                                   | Time living in the US: 3.5 years on average |
|                                   | Criteria for inclusion: ‘women of Mexican origin who had at least one child in the participating school.’ (p.230) |
**Methods reported in study**  
*Criteria for exclusion:* - -  
Sampling strategy: 'Drawing from the 15 schools that met these criteria [having at least 50% immigrant parents and more than 85% students of low SES; and a principal who expressed an interest in receiving and supporting the adult ESL class], [the author] randomly selected a single ESL class from each of four different schools to receive the support of the study’s intervention and did the same for the selection of a comparison (control) group. The author included women of Mexican origin who had at least one child in the participating school.

*Data collection strategy:* ‘...all students completed a pre- and posttest of the Basic English Skills Test (Center of Applied Linguistic, 1989), a valid and reliable oral assessment; students can achieve a score of 0-75. Each student also took a pre- and post-parent-involvement survey, which contained 20 questions.’ (p.233).

**Results**

|                          | N   | Treatment group, mean score | Control group, mean score | P value |
|--------------------------|-----|-----------------------------|---------------------------|---------|
| ESL*, pre-               | 77  | 16.1                        | 21.7                      | 0.30    |
| ESL, post-               | 67  | 40.6                        | 28.7                      | 0.01*** |
| ESL, change over time    | 57  | 24.5                        | 7                         | <0.0001*** |
| Parent Involvement*, change over time | 56  | 11.4                        | 1.8                       | <0.0000*** |

*Students could attain a possible 75 points on the ESL test.

**Students could attain a possible 20 total points on the Parent Involvement survey questions measuring change over time.

***Statistically significant at the p<0.01 level.

*Table 1: ESL and Parent Involvement Scores.
*Kilde: Waterman 2008, p. 234.*

*Drop-out: N=21

Drop-out analysis: Not reported

**Comments**

Main conclusion given by the main author: ‘In conclusion, the findings presented in this paper reinforce a central component of the research base: Mexican mothers are highly motivated to support their children’s education and partner with schools. Language barriers and a lack of familiarity with aspects of U.S. schools often impede these women from fully expressing their commitment to education and parent-school collaboration.’ (246).
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