



Postpartum midwifery care and familial psychosocial risk factors in Switzerland: A secondary data analysis

Hebammenbetreuung im Wochenbett und familiäre psychosoziale Risikofaktoren in der Schweiz: eine Sekundäranalyse

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Abstract

Introduction: Psychosocial resources of parents are vital for the health and development of their children. Families in stressful circumstances should receive early seamless care to strengthen their parental resources. Independent midwives provide ambulant postpartum care in most families in Switzerland, and hence could play an important role in the early assessment and care of families at risk.

Methods: Comprehensive routine data of Swiss independent midwives were used for secondary analysis. Frequencies of known psychosocial risk factors were derived and compared to other data sources. Group comparisons were made with respect to family characteristics and midwifery care.

Results: Only some of the considered risk factors are representable in the midwives' data. 18.6% of all families have one and 6.25% have multiple such representable risk factors. Immigrant mothers from developing and emerging countries, very young or older mothers and large families are thereby particularly often affected. Burdened families receive more home visits, but have a later onset of ambulant postpartum care. They suffer more often from breast-feeding problems and are more frequently referred to other disciplines.

Discussion: Independent midwives in Switzerland document some of the known psychosocial risk factors and adapt their care in routine practice. The collection of data with a better coverage of the known psychosocial risk factors, ideally using validated assessment instruments, is recommended, and further research is required for a more in-depth understanding of the current interdisciplinary collaboration and the needs of families and care providers.

Abstract

Einleitung: Elterliche psychosoziale Ressourcen sind grundlegend wichtig für eine gesunde kindliche Entwicklung. Familien in belastenden Umständen sollten früh und nahtlos Unterstützung zur Stärkung ihrer elterlichen Ressourcen erhalten. Frei praktizierende Hebammen betreuen die meisten Familien in der Schweiz zu Hause im Wochenbett und könnten deshalb eine wichtige Rolle spielen für die Erfassung und Betreuung belasteter Familien.

Methode: Umfassende Daten der schweizerischen frei praktizierenden Hebammen wurden für eine Sekundäranalyse herangezogen. Die Häufigkeiten bekannter psychosozialer Risikofaktoren anhand dieser Daten wurden mit denen anderer Datenquellen verglichen und Gruppenvergleiche in Bezug auf Familienmerkmale und Merkmale der Hebammenbetreuung angestellt.

Resultate: Nur ein Teil der untersuchten Risikofaktoren ist in den Daten der Hebammen abbildbar. 18,6% aller Familien weisen einen, 6,25% mehrere solche abbildbare Risikofaktoren auf. Mütter aus Entwicklungs- und Schwellenländern, sehr frühe oder späte Mütter sowie grosse Familien sind dabei besonders oft belastet. Belastete Familien erhalten mehr Hausbesuche, aber zeigen einen späteren Beginn der ambulanten Nachsorge. Zudem leiden sie öfters unter Stillproblemen und werden häufiger an andere Fachpersonen überwiesen.

Diskussion: Frei praktizierende Hebammen in der Schweiz dokumentieren in ihrer täglichen Arbeit einige der bekannten psychosozialen Risikofaktoren und passen die Betreuung beim Vorliegen solcher Risikofaktoren an. Das Erheben von Daten mit einer umfassenderen Abdeckung der bekannten psychosozialen Risikofaktoren, idealerweise mithilfe von validierten Instrumenten, wird empfohlen und weiterführende Forschung ist erforderlich für ein vertieftes Verständnis der aktuellen interdisziplinären Zusammenarbeit und der Bedürfnisse von betroffenen Familien und Fachpersonen.

Keywords

Independent midwife – postpartum care – psychosocial risk factors – infant health – quantitative methods

Keywords

Hebamme – frei praktizierend – Wochenbettbetreuung – psychosoziale Risikofaktoren – kindliche Gesundheit – quantitative Methode



INTRODUCTION

Human infants are born completely dependent and require care from adults for many years in order to survive and thrive. Parental psychosocial and material resources facilitate a healthy development of their children, most importantly through a warm and caring relationship (Grossmann & Grossmann, 2012; Masten & Coatsworth, 1998). However, a lack of such familial resources can hinder the child's development. Indeed, among the risk factors for a healthy infant development, many are related to the health and resources of its parents (Zeanah, Boris, & Larrieu, 1997). The known familial risk factors range from economic scarcity (Duncan, Magnuson, & Votruba-Drzal, 2014; Huston & Bentley, 2010; Thompson, 2014) to mental health problems (Leight, Fitelson, Weston, & Wisner, 2010; Murray & Cooper, 1997) and attitudes (Velders et al., 2011; Wille, Bettge, & Ravens-Sieberer, 2008) from side of the parents, but also include infant characteristics requiring intensified parental care, such as multiple pregnancies, preterm birth, or illness (Leonard & Denton, 2006). Many studies have shown possible middle- and long-term influences of risk factors on infant health leading to increased mental health problems (Ordonez & Collins, 2015; Rolim Lima et al., 2013; Zalsman, Birmaher, & Brent, 2006) as well as emotional and behavioural problems (Edwards & Hans, 2015; Magee & Roy, 2008; Smeekens, Riksen-Walraven, & van Bakel, 2007; Velders et al., 2011). Moreover, it has been shown that the healthy development of a child is particularly at risk, if several psychosocial risk factors occur simultaneously in the family (Bauman, Silver, & Stein, 2006; Edwards & Hans, 2015; Wille et al., 2008). Families in difficult circumstances need special care to strengthen their parental resources. Care and intervention programmes designed to meet the special needs of these families have been shown to lead to enhanced parental resources, and thereby better outcomes for children (Knerr, Gardner, & Cluver, 2013; Komro, Tobler, Delisle, O'Mara, & Wagenaar, 2013; Sidor, Kunz, Eickhorst, & Cierpka, 2013; Windorfer, 2009; Zeanah, Berlin, & Boris, 2011). Mental disorders often have very early origins (Ordonez & Collins, 2015) and stress during pregnancy, and the early years of life are known to be particularly harmful and influential (Buss, Entringer, & Wadhwa, 2012; Lupien, McEwen, Gunnar, & Heim, 2009; Shonkoff, Boyce, & McEwen, 2009; Tegethoff, Greene, Olsen, Schaffner, & Meinschmidt, 2011). Similarly, the negative effects of poverty on a child's development seem to be most pronounced if the exposure happens during the first years of life (Dearing, Berry, & Zaslow, 2005; Duncan et al., 2014; Huston & Bentley, 2010). Therefore, care programmes should set in as early as possible to strengthen the parental resources from the beginning for

an effective prevention of health disadvantages. Another important characteristic for a successful support of burdened families is the coordination of care in a multi-disciplinary team (Hesselink & Harting, 2011; Leonard & Denton, 2006).

In Switzerland, independent midwives (Blöchliger, Kurth, Kammerer, & Frei, 2014) and family nurses (Klausler-Troxler, Kurth, & Spirig, 2014) provide primary care and support for new families complementary to the medical care of physicians. In recent years, a majority of new families utilised the ambulant services of independent midwives at home after hospital discharge (Erdirin, Iljuschin, van Gogh, Schmid, & Pehlke-Milde, 2015). This broad and early access to families by midwives could contribute to a successful seamless care of burdened families from the earliest days on. On the one hand, midwives can be involved performing an early assessment of parental resources and referring families to other disciplines when indicated (Austin, Colton, Priest, Reilly, & Hadzi-Pavlovic, 2013; Berglund, Lindberg, Nystrom, & Lindmark, 2007; Blackmore et al., 2006; Spyridou, Schauer, & Ruf-Leuschner, 2015). On the other hand, midwives can provide prolonged and specialised care for burdened families themselves as part of the interprofessional collaboration team (Ayerle, Makowsky, & Schücking, 2012; Hesselink & Harting, 2011; Sidor et al., 2013; Windorfer, 2009). Caseload midwifery can be a mean to enhance the involvement of midwives and increase referral rates (Rayment-Jones, Murrells, & Sandall, 2015), and educational programmes can support the comfort and competences of midwives and other professionals regarding the assessment of risk factors (Gunn et al., 2006). In Switzerland, there are some local initiatives to facilitate the coordination and collaboration between independent midwives and other disciplines (Frey et al., 2015; Späth, Kurth, & Zemp Stutz, 2014). Furthermore, the scheduled period for the 10 regular home visits by an independent midwife covered by basic insurance has just been extended from 10 days to 8 weeks in 2015. However, there is currently no coordinated, institutionalised involvement of midwives in the assessment and care of families with special needs and little is known about possible existing informal practices to this end.

RESEARCH QUESTIONS

The aim of this study is to assess the status quo among the Swiss independent midwives providing postpartum care at home regarding the assessment of familial risk factors and the care of families burdened with such risk factors by analysing an existing database. In particular, answers to the following questions are sought:

1. Are the known familial psychosocial risk factors with respect to healthy infant development represented



- in the routine documentation of independent midwives?
2. What are the frequencies of these risk factors in new families during the postpartum period in Switzerland?
 3. How do these frequencies in the routine documentation by independent midwives compare with the frequencies of other data sources?
 4. What are the percentages of families burdened with one risk factor and with multiple risk factors in the analysed data?
 5. Is the risk factor load distributed differently in mothers of different domicile, nationality, parity, and age?
 6. Is the postpartum care by independent midwives different in families burdened with representable risk factors than in families without them?

METHOD

We performed retrospective, secondary data analyses on routine data of the Swiss independent midwives. The data stems from a survey by the Swiss Federation of Midwives (SHV/FSSF). A list of familial psychosocial risk factors has been derived from three German-language screening instruments applied in practice: the 'Ludwigshafener peripartaler Erhebungsbogen (LupE)' (Filsinger, Gehrman, Bechtold, Ziegenhein, & Kindler, 2007; Schürmann-Ebenfeld & Kindler, 2015), the 'KINDEX' interview (Spyridou et al., 2015) and the short screening 'ZEPPELIN' (Neuhauser et al., 2014). All items that were present in at least one of the three screening instruments have been chosen for the list of risk factors for this study. The only exception is the country of origin of the mother and the father, being a risk factor in 'KINDEX', which has not been adopted as a risk factor for this study, because immigration per se cannot be regarded as a risk factor in Switzerland in our opinion. However, the nationality of the mother is considered in the analysis of the risk factor load to assess possible differences between mothers of different origin. Subsequently, we classified all factors on this list into one of the following categories according to their representation in the survey data:

- well representable
- vaguely representable
- not representable

Frequencies of all (well or vaguely) representable risk factors in the data were calculated referring to the total of cases with analysable entry for each item. Where reference data were available, comparisons therewith have been made.

For all registered cases in the dataset, the loading of risk factors per family was counted. This number of risk

factors per family was grouped into three categories for further analyses: families without, families with one, and families with several representable risk factors. We analysed this risk factor load per family in group comparisons for nationality, age, and parity of the mother, a regional analysis on the level of the Swiss cantons and different characteristics of midwifery postpartum care. Frequencies and mean values and their 95 % confidence intervals were used in the comparisons, and the results are shown with three significant digits. For the confidence intervals of frequencies, Agresti-Coull intervals were employed. All analyses shown have been performed with R (R Core Team, 2014).

DATA

Data from the survey of Swiss independent midwives ('*Tätigkeitserfassung der frei praktizierenden Hebammen der Schweiz*') were analysed for this study. This is a compulsory survey for all independent midwives in Switzerland carried out each year since 2005 by the SHV/FSSF. The survey uses an online questionnaire for the collection of data, and annual reports on its results are published online (Erdin et al., 2015). The extensive questionnaire covers socio-demographic and obstetric characteristics of the families as well as services delivered by the midwife during pregnancy, childbirth, and the postpartum period. The survey is not based on validated instruments, but was developed to closely match the conventional routine documentation of independent midwives in Switzerland. The data entry is anonymous from the beginning; therefore, some families may be recorded twice or more times in the survey, if they have been cared for by more than one independent midwife. In the 2014 enquiry, in 6.3 % of all entries, the midwife stated that there is another entry for this family, and in 5.3 %, she stated that she did not know whether this was the case. The number of cases in the survey is, therefore, not corresponding to the number of families per se, but to the number of unique midwife-family pairs. Because of this, we use the term 'case' when referring to the entries in the survey.

We used the data of the 2014 enquiry for this study, which were the latest available at the time of the analyses. This enquiry encompasses a total of 62, 917 cases of which 60, 090 comprise postpartum care by the reporting midwife. These 60, 090 cases were used as the dataset for our analyses. However, for the analyses concerning the characteristics of the midwifery postpartum care, cases with no indication of the number of postpartum visits ($n = 3838$) have been excluded, resulting in a sample of 56, 252 cases.



RESULTS

Frequency of Risk Factors

The list of familial psychosocial risk factors from the existing screening instruments taken as a starting point comprised 26 items. Many of these items, such as young age, unemployment, alcohol or drug abuse can concern the mother or the father. As there is no information on the father in our dataset, we subsume all risk factors concerning the father under the term ‘characteristics father’. The resulting list of 27 familial psychosocial risk factors is shown in Table 1. The reference data were found from national censuses (BFS, 2015a; EURO-PERISTAT, 2013; SECO, 2015) and from one meta-analysis (O’Hara & Swain, 1996).

Six risk factors are explicitly stated and unambiguously defined in the dataset and are, therefore, classified as ‘well representable’: young age, single parenthood, low education, and unemployment from side of the mother and preterm birth and multiple births from side of the child. For all of them, reference datasets are available. The frequencies of these factors vary from rare phenomena (e.g., young maternal age, 0.197 %) to rather widespread characteristics (e.g., low maternal education, 13.7 %).

The comparison with the reference data shows a very good agreement for low education of the mother, preterm birth, and multiple births. The maternal unemployment rate in our data, relating to new mothers only, is lower than the unemployment rate of women between 25 and 39 years in Switzerland during the same year, indicating that unemployed new mothers might be underrepresented in our data. The rate of young mothers is higher in the EURO-PERISTAT 2010 report than in the survey data. However, this is expected, as in our definition, only first-time mothers younger than 18 years and mothers with more than one child younger than 20 years are included, whereas the EURO-PERISTAT definition includes all mothers younger than 20 years. The rate of single mothers in our data is considerably lower than in the data of the population census 2000. The explanation for this difference is twofold: Firstly, in our dataset, only single mothers are counted, whereas the reference data count also single fathers. Secondly, the midwives are usually in contact with the families up to a few days or weeks postpartum, whereas in the population census, families with young children up to 1 year have been included. Another six familial psychosocial risk factors are ‘vaguely representable’ in the data of the survey (Table 1). Four of these risk factors are at least partly

Table 1: List of familial psychosocial risk factors derived from existing screening instruments, classified according to their representability in the data of the survey: description of their representation in the data, citation of reference data and frequencies of the risk factors in the survey data and the reference data

	Risk factor	Represented in the data as	Freq. data	Reference data	Freq. Ref. data
well representable	Young mother	< 18y or < 20y and > 1 children	0.197 %	EURO-PERISTAT 2010 < 20y	1.1 %
	Single mother		2.00 %	BFS, population census 2000	5.6 %
	Low education mother	No vocational training	13.7 %	BFS, women’s education 2014	13.8 %
	Unemployment mother		4.44 %	BFS, unemployment rate 2014	5.3 %
	Preterm birth	< 37 weeks of gestation	7.35 %	EURO-PERISTAT 2010	7.4 %
	Multiple birth		2.00 %	BFS, live births 2014	1.8 %
vaguely representable	Social/linguistic isolation	PI*: ‘migration’	2.64 %	BFS, income poverty 2012	7.7 %
	Financial distress	PI*: ‘poverty’	0.637 %		
	Alcohol/drugs mother	PI*: ‘drug abuse’	0.150 %	O’Hara and Swain (1996): postpartum depression rate	13 %
	Maternal medical conditions	‘postpartum depression’, ‘depression’	2.57 %		
	Family violence	PI*: ‘domestic violence’ and ‘suspected child abuse’	0.321 %		
	Infant medical conditions	‘malformation’ and ‘heart defect’	1.30 %		
not representable	Characteristics father	Mother raised in children’s home			
	Nicotine	Lack of personal hygiene			
	Unwanted pregnancy / no rejoice in pregnancy	Lack of self-organisation and planning			
	Short birth spacing	Problems to accept / care for the child			
	Pregnancy complications	Child adopted or in foster home			
	Crowded housing	Family known at youth welfare service			
	Massive couple conflicts	Regulation disorder of the child			
	History of abuse				

* PI: Statement in the category ‘psychosocial indication’ for problems during the postpartum period or as indication for medically prescribed visits after ten days postpartum



Table 2: Total number of representable risk factors per family (n = 60 090)

Number of risk factors	0	1	2	3	4	5	6	7
Number of families	45 161	11 173	2 762	741	193	52	7	1
Frequency of families	75.2 %	18.6 %	4.60 %	1.23 %	0.321 %	0.087 %	0.012 %	0.002 %

matching with statements the midwife can make in the survey in the category ‘psychosocial indications’ (‘migration’, ‘poverty’, ‘drug abuse’ and ‘domestic violence’, and ‘suspected child abuse’). For the risk factor ‘maternal medical conditions’, only mental health problems (‘postpartum depression’ and ‘depression’) are documented, and for ‘infant medical conditions’, the indications ‘malformation’ and ‘heart defect’ can be made in the survey. The six vaguely representable risk factors are, hence, either relying on ill-defined terms (e.g., migration, poverty, depression) or representing only subsets of a risk factor (e.g., drug abuse, mental health problem). We assume that different midwives handle the criteria for indications with ill-defined terms differently. One midwife might, for instance, state ‘poverty’ in a family living clearly below the common standard in terms of housing and recreation, whereas another midwife would only document ‘poverty’ if a family merely can’t afford to buy food, clothing, and diapers. The comparison with the reference data, where available (financial distress and postpartum depression as reference for mental health problems of the mother), shows that the frequencies in the survey data are clearly too low for these factors. That is, the midwives make this statement too seldom in the current documentation procedure. This could have two reasons: first, there are possibly midwives not documenting this indication at all, and second, it could be that many midwives make this statement only if the phenomenon is very obvious and severe. In the case of postpartum depression, the fact that the midwife often sees the family only during the first few days postpartum could further contribute to a comparatively low frequency, as postpartum depression oftentimes develops later on. We presume that the frequencies of the vaguely representable risk factors where no reference data were found are also too low, because the mechanisms explained earlier probably apply to them as well. Additionally, some of them are only subsets of a phenomenon, leading to too low frequencies by definition.

Table 1 shows that numerous risk factors (14 individual risk factors as well as all characteristics concerning the father) have no representation in the data of the survey. The characteristics of the father would include the six characteristics of the mother stated individually in the list, namely young age, single parenthood, low education, unemployment, disease, and alcohol or drug abuse.

Summing up, some of the familial psychosocial risk

factors are well representable in the data of the survey, and the comparison with reference data suggests a high validity for them, others are only vaguely or partly representable, leading to too low frequencies and others are not representable at all.

In a next step, the total number of representable risk factors per family was computed for all 60, 090 cases. The results are displayed in Table 2 and show that 75.2% of all families in our dataset have no recordings of representable risk factors, 18.6 % exhibit one risk factor, and 6.25 % more than one risk factor in their records. It is important to note that these analyses are underestimating the real psychosocial load on families in Switzerland because the frequencies of the vaguely representable risk factors are too low and because some risk factors have no representation in the survey data (as explained earlier). The real shares of families loaded with psychosocial risk factors are, therefore, expected to be larger than the numbers aforementioned. Nevertheless, further analyses on properties of burdened families and differences in the postpartum midwifery care can be made with the existing data under the assumption that the missing risk factors (non-representable or not documented) are not diametrically distributed compared to the documented risk factors.

Family Characteristics

Figure 1 shows the geographic distribution of the proportion of families loaded with more than one risk factor within Switzerland. Dark colours denote higher proportions of families with more than one risk factor. In the region of western and southern Switzerland, proportions of burdened families are particularly high. The largest proportion (more than 12 %) is found in Neuchâtel, a French-speaking canton in western Switzerland. Central and eastern Swiss cantons, on the contrary, exhibit particularly low proportions. The lowest proportion (less than 2 %) is found in Uri, a German-speaking canton in central Switzerland. In the north and northeast of the country, intermediate proportions are observed. The two predominantly urban cantons Geneva and Basel-Stadt show higher proportions than their surroundings. These observed geographical differences could stem from real differences in the population between the cantons, but also from differences in the access to midwifery care or even in documentation behaviour.

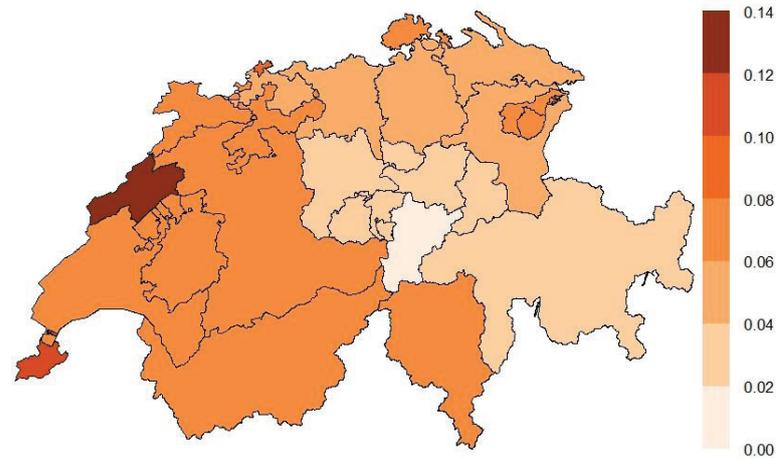


Figure 1: Geographical distribution of the proportion of families with more than one representable risk factor on the level of the Swiss cantons

If, for instance, independent midwives are organised in a network to enhance the referral from hospital to ambulant postpartum care, as to our knowledge was the case in Geneva and Basel-Stadt in 2014 (Kurth, 2013; Späth et al., 2014), a larger proportion of families with psychosocial risk factors might access midwifery care. To assess the possible differences in documentation behaviour, further analyses (not shown) on the geographical distribution of the load with exclusively well-representable risk factors have been made. These factors are quite clear in their definition and are, therefore, expected to be documented uniformly by different midwives. The results showed a similar geographical distribution than the load with all representable risk factors in Figure 1, suggesting that the differences are mainly due to differences in the population and/or differences in the access to midwifery care. A reason for the particularly low proportions in central and eastern Switzerland could lie in the fact that the cantons in this region are relatively wealthy and rural, which could reflect in differences in the population.

In order to assess whether the risk factor load is distributed differently in families with mothers of different nationality, parity, and age, group comparisons of these characteristics between the families with no risk factors, one risk factor, and multiple risk factors have been made. The group comparison for nationality is shown in Figure 2. Nationalities are grouped in different categories and sorted by group size. The largest group are mothers with Swiss nationality, followed by mothers from three European regions: Eastern Europe (incl. Russia), Northern, Central, and Western Europe and Southern Europe. The largest non-European group are mothers from Asia, followed by mothers from Africa, Latin America and Caribbean, North America and Australia and Oceania. Mothers from Switzerland, Northern, Central, and Western Europe, North America and Australia and Oceania exhibit larger proportions of

families with no risk factors and lower proportions of families with one and multiple risk factors than the other groups. Mothers from Africa are markedly more often burdened with multiple risk factors and less often have no representable risk factors than all other groups. The confidence intervals (denoted by delimited black lines at the top of each bar) show that these differences are not produced by random fluctuations, but by real differences between the groups.

Likewise, analyses with group comparisons for maternal age and parity have been made (not shown here for the sake of brevity). Families with mothers younger than 26 years or older than 45 years are markedly more often burdened with one or several representable psychosocial risk factors than families with mothers between 26 and 45 years. It is important to note that one risk factor on our list is defined by very young maternal age (< 18 years or < 20 years with more than one child, cf. Table 1). This leads to a certain increase of risk factor load in young mothers by definition. However, this risk factor is very rarely observed (0.197 %), and the vast majority of mothers younger than 26 years do not fall into this category. Therefore, only a minor distortion is produced by this artefact, and there is no significant influence on the overall result and conclusion. We could imagine higher rates of unplanned pregnancies during these phases of life as one possible reason for the observed accumulation of risk factors in early and late mothers. This could mean that the arrival of a child falls into a situation that is not considered optimal by the parents. For young mothers, the lack of time to educate and professionally establish themselves could additionally increase the risk factor load (e.g., low education, unemployment, financial distress). For parity, the group comparisons show that large families more often have one or several representable psychosocial risk factors than small- or medium-sized families. If all nationalities are included, this effect is

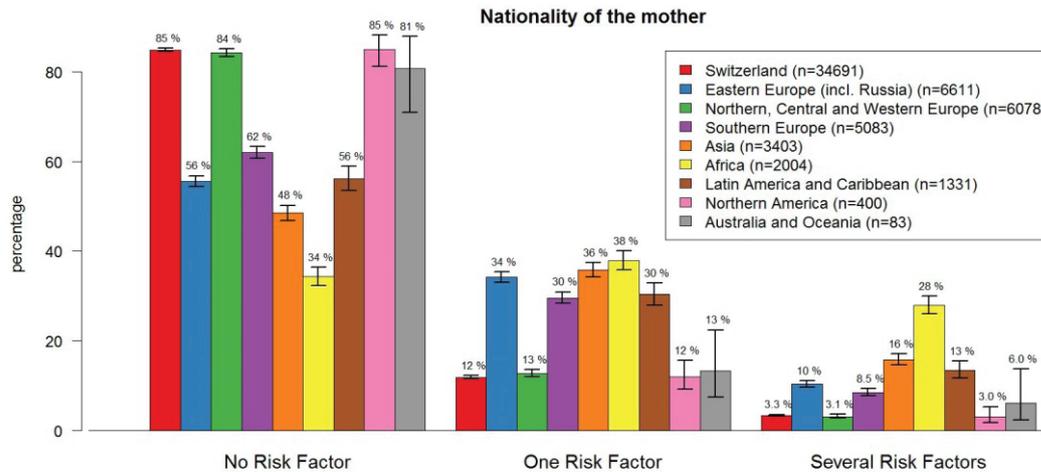


Figure 2: Loading of representable risk factors grouped by the nationality of the mother. A list of countries in each category is provided in the appendix. (The black lines at the top of each bar denote the 95 % confidence interval of each proportion.)

already visible for families with three children. If only Swiss mothers are compared, the effect sets in with the fourth child. Among larger families, the proportion of burdened families increases with every additional child. In small families, however, the contrary is the case: families with two children are slightly less often burdened with representable risk factors than families with one child. We presume that parents of large families are more stressed – economically, physically, and psychologically – which could induce some risk factors (e.g., financial distress, health problems). Inversely, stressful life circumstances as the risk factors in our list might lead to the decision of not having a second child, as well as to unplanned further pregnancies.

Midwifery Care

In a final step, group comparisons for different characteristics of midwifery postpartum care have been made to assess whether the postpartum care by independent midwives is different in families with than in families without representable risk factors. The results of these group comparisons are shown in Table 3. Bold numbers are the empirical mean values and frequencies, the numbers in square brackets are their 95 % confidence intervals. The characteristics with no overlap of confidence intervals between the risk factor groups have a high probability for real differences in the population (i.e., between these groups in general, for instance also in other years). Families with multiple risk factors make demands of more home visits overall on average than families with one risk factor, whereas families with no risk factors exhibit the lowest mean of total consultations. This total number of consultations includes regular home visits during the first 10 days postpartum, second visits on the

same day during the first 10 days postpartum, medically prescribed consultations after 10 days postpartum, breastfeeding advice without medical prescription after 10 days postpartum, and discharge examinations at 6 weeks postpartum. These different consultation categories have been analysed separately in further group comparisons listed in Table 3. Families without representable risk factors more often receive home visits during the first 10 days postpartum than families with risk factors. This is also true for the first day, second to fourth day, and fifth to tenth day postpartum considered separately. The 95 % confidence intervals do not overlap except for the frequency of visits during the first day postpartum in the groups with risk factors, where numbers are relatively small and confidence intervals are, therefore, rather large. For the category of second visits on the same day during the first 10 days postpartum, no differences for overall mean and frequency have been found for the three groups (confidence intervals overlap each other, i.e., the observed differences could well be produced by chance). However, if the comparison of second visits is made separately for families who had regular visits during the first 4 days postpartum and families without such very early visits, differences become visible: Second visits on the same day are more frequent in families without risk factors, if the family has had at least one regular visit during the first 4 days postpartum. In contrast, if the first regular visit took place after the fourth day postpartum, second visits are more frequent in families with one and even more so in families with multiple risk factors. This suggests that families without risk factors more often receive a second visit on the same day, because they are home at a very early postpartum stage (home birth, ambulant birth, exceptionally early hospital discharge), whereas families with risk factors more often require a second

visit because of problems occurring after the fourth day postpartum, when families typically are at home after hospital discharge.

Medically prescribed consultations after 10 days postpartum are considerably more frequent in families with representable risk factors. This suggests increased needs of families with risk factors during the late postpartum period, and increased care by independent midwives and prescriptions for prolonged midwifery care by physicians as a response to these needs. Furthermore, there are far more families with medically prescribed consultations who have not been visited by the midwife during the first 10 days. These families have, thus, not been referred to the reporting midwife until the later postpartum period, indicating a possible gap in the care of families with particular needs after hospital discharge.

Breast feeding advice after 10 days postpartum is similarly frequent in all three risk factor groups, and there is only a slightly higher mean number of such consultations in families with risk factors. In contrast to this, an indication of breast-feeding problems is considerably more often found in families with risk factors. The largest differences, thereby, concern problems with insufficient milk and failure to thrive as well as expressing milk, weaning, and infant formula. We suspect increased maternal distress

in families with risk factors as a possible reason for this higher incidence of breast-feeding problems. The discrepancy that families with risk factors do not receive considerably more breast-feeding advice consultations could be explained by two factors. On the one hand, families with risk factors often receive medically prescribed consultations in the later postpartum period, and breast-feeding advice might be given by the midwife during these visits. On the other hand, the types of breast-feeding problems with the largest differences described earlier suggest that mothers in families with risk factors more often wean early, which could make further breast-feeding advice unnecessary.

Referrals to other disciplines by the reporting independent midwife are overall markedly more frequent in the group of families with multiple risk factors than in the other two groups (c.f. Table 2). In Figure 3, these referrals are analysed in more detail, showing the frequencies of referrals to individual professional groups. Families with multiple risk factors and families with one risk factor are more often referred to social services, psychologists/psychiatrists, paediatricians, other medical specialists, and the unspecific category 'other'. And the referral frequency for all these services is particularly high for families with multiple risk factors. Families in the

Table 3: Characteristics of postpartum midwifery care grouped for risk factor loading: means and frequencies with corresponding 95% confidence intervals

	No risk factor	One risk factor	Several risk factors
Number (n)	42 109	10 521	3622
Total number of consultations: mean	5.35 [5.33, 5.38]	5.57 [5.51, 5.63]	6.09 [5.98, 6.19]
Consultations until 10 days pp			
Mean	4.08 [4.06, 4.10]	3.71 [3.67, 3.75]	3.48 [3.41, 3.54]
frequency	96.8% [96.7%, 97.0%]	92.7% [92.2%, 93.2%]	88.8% [87.7%, 89.8%]
Cons. 1 st day pp: frequency	5.58% [5.37%, 5.80%]	2.17% [1.91%, 2.46%]	2.04% [1.63%, 2.56%]
Cons. 2 nd -4 th day pp: frequency	40.8% [40.3%, 41.3%]	36.1% [35.2%, 37.0%]	29.7% [28.2%, 31.2%]
Cons. 5 th – 10 th day pp: frequency	94.3% [94.0%, 94.5%]	90.7% [90.2%, 91.3%]	87.1% [86.0%, 88.2%]
Second visits on same day during first 10 days pp			
mean	0.275 [0.266, 0.284]	0.247 [0.231, 0.263]	0.264 [0.236, 0.292]
frequency	11.8% [11.5%, 12.1%]	12.0% [11.4%, 12.7%]	13.0% [11.9%, 14.1%]
AND visits during first 4 days: frequency	6.48% [6.25%, 6.72%]	5.09% [4.69%, 5.53%]	4.64% [4.00%, 5.37%]
AND no visits during first 4 days: frequency	5.28% [5.07%, 5.50%]	6.94% [6.47%, 7.44%]	8.37% [7.51%, 9.31%]
Medically prescribed consultations after 10 days pp			
mean	0.460 [0.447, 0.472]	1.04 [1.00, 1.08]	1.76 [1.67, 1.84]
frequency	15.6% [15.2%, 15.9%]	28.4% [27.5%, 29.3%]	42.0% [40.4%, 43.6%]
AND no consultations during first 10 days: frequency	1.10% [1.00%, 1.20%]	5.07% [4.66%, 5.50%]	9.25% [8.35%, 10.2%]
Breast Feeding			
B.f. advice after 10 days pp: mean	0.487 [0.479, 0.495]	0.545 [0.527, 0.563]	0.556 [0.524, 0.588]
B.f. advice after 10 days pp: frequency	29.6% [29.2%, 30.0%]	31.3% [30.4%, 32.2%]	29.7% [28.3%, 31.2%]
B.f. problems, at least once: frequency	46.5% [46.0%, 47.0%]	55.0% [54.1%, 56.0%]	63.9% [62.3%, 65.4%]
Referral to other disciplines			
frequency	12.2% [11.9%, 12.6%]	12.9% [12.3%, 13.6%]	19.5% [18.2%, 20.8%]

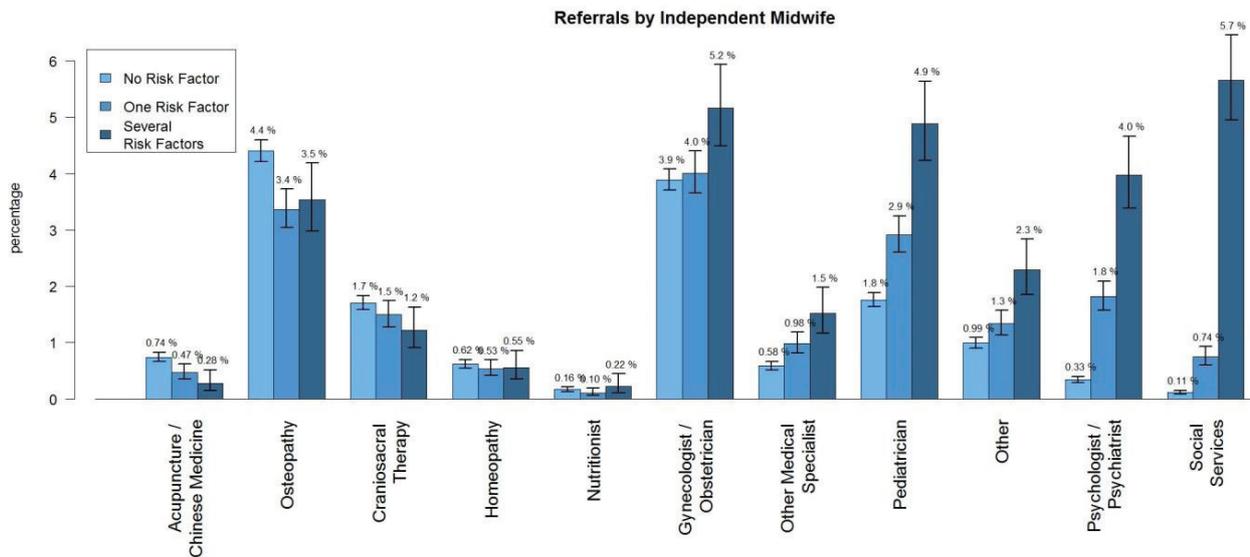


Figure 3: Referral to other disciplines by the independent midwife, grouped by risk factor loading. (The black lines at the top of each bar denote the 95 % confidence interval of each proportion.)

multiple risk factor group are additionally more often referred to gynaecologists/obstetricians than the other two groups. Referrals to nutritionists and homeopathy are about equally frequent in all three groups, whereas referrals to acupuncture/Chinese medicine, osteopathy, and craniosacral therapy seem to be slightly more frequent in families without risk factors. An enhanced need for referral to social, psychological and medical services by families with risk factors is plausible, and independent midwives seem to recognize this need and increase referral rates. The probably slightly lower frequency of referrals to some alternative medicine treatments for families with risk factors could possibly be rooted in more restricted temporal or financial resources.

LIMITATIONS

The data utilised in this study are valuable owing to their completeness and vast sample size, but exhibit considerable shortcomings. First of all, as the survey was developed to adhere closely to the established routine documentation, there is a lack of clear definitions in some questions/categories. This leaves room for interpretation and presumably leads to heterogeneous data collection by different independent midwives, impairing the value of the data. Secondly, the anonymous recording results in double or multiple entries of some families (approximately 7-11%) in the survey, ruling out the possibility of inferring the exact number of families involved. This could affect our results if the families recorded twice or more often had systematically different characteristics than the families recorded only once.

The fact that the study was conducted as a secondary analysis on an existing dataset, which has been collected for a different purpose and does not include validated assessment instruments, leads to the constraint that many known psychosocial familial risk factors are only vaguely representable or not representable at all in the data. Furthermore, not all families in Switzerland are cared for by independent midwives during the postpartum period. And if, for instance, families without postpartum midwifery care had different psychosocial circumstances than families with such care, our results would not represent the overall situation of new families in Switzerland. The true incidence of psychosocially burdened families in Switzerland can, therefore, not be assessed with this dataset.

DISCUSSION

Some of the known familial psychosocial risk factors with respect to infant development are well-represented in the routine documentation of independent midwives in Switzerland. The frequencies of these factors vary from very rare (e.g., teenage motherhood) to quite widespread (e.g., low education, preterm birth) phenomena. The comparison with the reference data shows a fairly good agreement for these well-representable risk factors. This indicates a high quality of the data and accordingly reliable documentation practices by independent midwives for these risk factors. Other risk factors are only vaguely representable in the independent midwives' documentation data, either because the phenomenon is only partly covered, or because of vaguely defined



terms and indication categories. As a consequence, the comparison with reference data, where available, shows an underestimation of the phenomenon in the survey data. The fact that single mothers, unemployed mothers, and possibly also poor families and women with postpartum depression seem to be underrepresented in the independent midwives data might indicate a restricted access of disadvantaged families to postpartum midwifery care. The third and largest group of known risk factors is not representable at all in the employed survey data of routine midwifery documentation. As a consequence, the real total load of psychosocial risk factors among young families in Switzerland is underestimated in this study by definition. Our analyses show that one in four families is loaded with at least one of the risk factors representable (well or vaguely) in the survey data, and one in sixteen is loaded with two or more of them. Knowing that these numbers can only be regarded as a lower bound to real prevalence, familial psychosocial risk factors are assumed to be quite frequent in Switzerland. The collection of data on a wider range of known familial psychosocial risk factors using clear definitions for better validity is recommended for a better assessment of the current situation in Switzerland. A consistent screening with a validated instrument by independent midwives and other health professionals during the postpartum period or even pregnancy could be a highly efficient, low-cost approach for the early assessment and seamless care of families at risk.

Immigrant mothers from developing and newly industrialised countries, very young or older mothers and large families with four or more children are particularly often burdened with psychosocial risk factors. With regard to a screening, it could be interesting to consider adding these characteristics to the list of risk factors to account for the vulnerability of these groups. In fact, this is already the case in some screening instruments employed in practice (Fisch, 2015). Geographically, there is a higher recorded proportion of burdened families in the cantons of western Switzerland and in predominantly urban cantons in the dataset utilised. Further research would be desirable in order to assess different supposable reasons for these regional differences, as real differences in the population or differences in access to midwives by families with risk factors. If it turned out that there are real geographical differences in the prevalence of risk factors, assessment and care programmes would be particularly beneficial for these regions.

Our analyses showed marked differences in the postpartum care by independent midwives between families with and families without risk factors representable in the dataset analysed. Families with risk factors make demand of more visits overall, but of less regular visits during the early postpartum period. They

more often receive prolonged, medically prescribed care during the later postpartum period and are more often referred to other disciplines by the midwife. Independent midwives, hence, seem to recognize a particular need for care in these families and provide it: not only do they prolong and intensify their own care, but also increase referrals to other care providers. Our analyses show that families with risk factors are more often not referred to midwives until after 10 days postpartum. This could be partly due to potentially longer hospital stays of burdened families. However, the typical hospital stay after birth in Switzerland lasts about 4 days postpartum (BFS, 2015b). The existence of a gap in coverage of care for families with psychosocial risk factors during the early postpartum period is, therefore, likely. We could imagine that the capability and/or will to organize midwifery care in advance could be lower in psychosocially disadvantaged families. This could be a reason for the observed care gap in case of a shortage of independent midwives, as it probably exists in Switzerland at least in some places (Erdin et al., 2015). Another reason could lie in a possible lack of referrals from hospitals to ambulant midwifery postpartum care. Closing this supposed gap between hospital discharge and ambulant postpartum care for disadvantaged families would presumably enhance maternal and infant health and reduce overall costs. Our analyses show moreover a higher overall incidence and differences in type of breast-feeding problems in families with risk factors. This implies that these families might require particular attention to facilitate successful and enduring breastfeeding. Conversely, comprehensive general care and support for families at risk might reduce maternal distress, and thereby also enhance breastfeeding. The observed increased referral rate in families with risk factors, particularly to the most relevant professional groups as social, psychological, and medical services highlights an existing participation of midwives in the interprofessional collaboration for seamless care of burdened families, at least to some extent.

Further research is needed to verify these findings and provide a more in-depth understanding of the current role of independent midwives in Switzerland, regarding the early care of psychosocially disadvantaged families. This research should focus on the analysis of current interprofessional collaboration and existing networks, the needs of burdened families during the first days, weeks, and months after birth, and the requirements of care providers in order to contribute to the assessment and care of families with special needs. Subsequently, pilot implementations of risk factor screening by midwives and interprofessional collaboration networks for very early, seamless care should be put into practice and evaluated in order to strengthen the resources of new parents from the beginning.



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Table A.1: List of countries in Figure 2

Category of Nationality	Countries
Eastern Europe (incl. Russia)	Kosovo, Albania, Serbia, Macedonia, Bosnia-Herzegovina, Russia, Croatia, Poland, Romania, Slovakia, Ukraine, Hungary, Czech Republic, Bulgaria, Slovenia, Latvia, Lithuania, Moldova, Estonia, Belarus, Montenegro
Northern Central and Western Europe	Germany, France, Great Britain, Austria, Principality of Liechtenstein, Netherlands, Sweden, Belgium, Finland, Denmark, Ireland, Norway, Island, Luxembourg
Southern Europe	Portugal, Italy, Spain, Greece, Andorra, Cyprus, Malta
Asia	Turkey, Sri Lanka, China, India, Thailand, Syria, Japan, Iraq, Vietnam, Philippines, Afghanistan, Iran, Lebanon, Pakistan, Israel, Bangladesh, Mongolia, Indonesia, Armenia, Nepal, Kazakhstan, Taiwan, Cambodia, North Korea, United Arab Emirates, Azerbaijan, Bhutan, Myanmar, Georgian Republic, Jordan, Kyrgyzstan, Kuwait, Laos, Malaysia, Oman, South Korea, Palestine, Saudi Arabia, Singapore, Tadzshikistan, Turkmenistan, Uzbekistan, Yemen
Africa	Eritrea, Morocco, Tunisia, Somalia, Democratic Republic of the Congo, Cameroon, Angola, Algeria, Ethiopia, South Africa, Côte d'Ivoire, Kenya, Senegal, Nigeria, Republic of the Congo, Cape Verde, Egypt, Madagascar, Togo, Ghana, Guinea, Burundi, Benin, Burkina Faso, Botswana, Central African Republic, Djibouti, Gabon, Gambia, Guinea-Bissau, Equatorial Guinea, Liberia, Libya, Mali, Mozambique, Mauretania, Mauritius, Niger, Rwanda, Sudan, Sierra Leone, Swaziland, Seychelles, Chad, Tanzania, Uganda, Zambia, Namibia, Zimbabwe
Latin America and Caribbean	Brazil, Colombia, Argentina, Mexico, Dominican Republic, Peru, Bolivia, Ecuador, Chile, Venezuela, Cuba, Dominica, Antigua and Barbuda, Costa Rica, Guatemala, Guyana, Honduras, Haiti, Jamaica, Nicaragua, Panama, Paraguay, El Salvador, Trinidad and Tobago, Uruguay
Northern America	United States of America, Canada
Australia and Oceania	Australia, New Zealand, Tonga

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