Comparison of Chiropractic Treatment Outcomes Depending on the Language Region in Switzerland: A Prospective Outcomes Study

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ABSTRACT

Objectives: Switzerland has optimal conditions for research of language-based cultural influences on low back pain (LBP). The aim of this study was to compare LBP treatment outcomes after chiropractic care between patients from the German- and French-speaking regions of Switzerland.

Methods: Baseline Numeric Rating Scale for pain (NRS), demographic, and Oswestry Disability Index (ODI) data were collected from patients presenting to 51 Swiss-German and 12 Swiss-French chiropractors. Prospective outcome data included the proportion reporting clinically relevant improvement on the Patient Global Impression of Change scale and the NRS change scores collected at 1 week; 1, 3, and 6 months; and 1 year. ODI change scores were collected until 3 months. The proportion improved between the 2 groups was compared using the χ^2 test. NRS and ODI change scores were compared using the unpaired t test.

Results: At baseline, only patient age comparing 853 Swiss-German and 215 Swiss-French patients revealed a significant difference. The Patient Global Impression of Change, NRS, and ODI had no significant differences between both patient groups up to 6 months. Between 6 months and 1 year the proportion reporting improvement continued to increase to 83.5% for German-speaking Swiss but reduced to 73.1% for French-speaking Swiss ($P = .01$). The NRS change scores were also higher for German speaking Swiss at 1 year compared with Swiss-French citizens ($P = .01$).

Conclusion: Treatment outcome data for LBP are comparable in the German and French parts of Switzerland until the 1-year time point, when people located in the French-speaking regions are more likely to have an increase in pain levels. (J Chiropr Humanit 2017;24:1-8)

Key Indexing Terms: Low Back Pain, Mechanical; Treatment Outcome; Cultural Diversity; Chiropractic; Spinal Manipulation

INTRODUCTION

After Gordon Waddell published a new multidimensional model on underlying causes of low back pain (LBP) in 1987, the scientific community began to turn their attention from a strictly biological model to a biopsychosocial model of LBP.^{1,2} There have been many studies published on the psychological and social aspects of LBP.³⁻⁹ Psychological factors, including depressive

mood, distress, somatization, catastrophizing, passive coping, and fear avoidance, have been reported as negative predictors for LBP improvement.^{5,10} Employment circumstances, formal education status, health care/insurance system, and ethnocultural aspects are the main social components.^{8,11-15} It is known that cultures and norms vary between countries and even within countries if language and customs significantly vary.^{8,14,15}

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Sociocultural Aspects of Low Back Pain in the Literature

The issue of ethnocultural effects on pain and especially LBP has been a controversial and much disputed subject within the literature. Some authors differentiate between the biologically determined terms *race* and *culture* or *ethnicity* as dynamic social ideas, whereas other authors use these terms as synonyms.^{16,17} In this study the terms *culture* and *ethnicity* are based on social attitudes and beliefs in the context of a response to a health problem. This corresponds

to a definition of culture by M.M. Free¹⁸: “Culture is a concept defined as a set of societal rules and standards developed over time and shared by the members of a particular society.”

In relation to LBP, different characteristics have been taken as a proxy for racial and cultural influence: language, skin color, nationality, immigration, and indigenous background.^{9,13-15,19-25} However, further social factors influencing LBP, including workplace, access to care, and formal education status, can operate as confounding factors while exploring cultural differences.^{26,27} To avoid these possible influences it is necessary to perform studies in a society where persons with different cultural backgrounds have an equal social security system and similar educational levels/opportunities and workplace distribution. Switzerland, a small country in the center of Europe with 8.3 million inhabitants (as of 2015) and 4 language-based microcultures within the overall Swiss culture, is an ideal site for such studies.²⁸

Switzerland, a Country With Language-Based Cultural Differences

There are 4 official languages in Switzerland: German, French, Italian, and Romansch. In a recent federal survey, 63.3% of the population reported speaking German or Swiss-German as their main language.²⁹ French, with 22.7% of the population, was the second most spoken language. Different studies on variable medical topics such as organ donation, use of hearing aids, antibiotic consumption, patients' needs in doctor-patient consultations, and mortality as a result of different diseases comparing Swiss-German, Swiss-French, and Swiss-Italian citizens have been conducted and revealed a culture-based diversity.³⁰⁻³⁴ However, not only medical properties have cultural differences. Political elections often indicate a significant barrier between the Swiss-German and Swiss-French voters. Swiss people humorously call it the *Röstigraben*, a traditional Swiss-German meal with hashed potatoes.³⁵

The Burden of Low Back Pain in Switzerland. As with most developed countries, low back pain is a major health problem in Switzerland. The Swiss Federal Office of Statistics stated the prevalence of people who suffered mild or strong LBP in the previous 4 weeks as 37.6%.³⁶ LBP was found to be the second most work-relevant disease after weakness and tiredness. A recent survey conducted on behalf of the Swiss League of Rheumatology reported 78.7% having experienced LBP at least once in the past year.³⁷ The total direct costs of LBP in Switzerland for medical treatment in 2005 were quoted at €2.6 billion, which corresponded to 6.1% of the total health care expenditure in Switzerland.³⁸ The indirect costs were calculated at approximately €6.3 billion.

Differences in Low Back Pain Between Swiss-German and Swiss-French Citizens. Investigations comparing Swiss-German and Swiss-French citizens for LBP-caused absenteeism from

work found that both groups declared similar percentages of absence. A total of 17% of Swiss-German citizens and 19% of Swiss-French citizens have been absent once from work, and 16% of the Swiss-German and 18% of the Swiss-French have been absent several times from work.³⁷ Zurbriggen et al³⁹ and Schulz et al¹⁹ compared workplace and psychosocial differences in LBP patients between the language regions of Switzerland. Swiss-German citizens attributed LBP more likely to hard physical labor, whereas the Swiss-French linked it more to psychosocial stress. Furthermore, they found differences in coping strategies with LBP. Swiss-Germans tended to react with active coping, believed in self-efficacy, and rated stress positively. Conversely, Swiss-French people chose passive coping strategies and had poor self-efficacy and a high analgesic use. Another interesting finding was that the Francophones had a stronger belief in physicians' influence on one's back pain.

As noted earlier, many studies have investigated ethno-cultural influences on LBP, a few of which were conducted in Switzerland. However, little research has been published on cultural influences on treatment outcomes for LBP. No previous studies have specifically investigated the differences in treatment outcomes after chiropractic care between Swiss-German and Swiss-French citizens with LBP. This is relevant, considering that they have significantly different coping strategies for their pain and attitudes as to the cause.^{19,39} Outcome data can be dependent not only on patients but also providers properties, social factors, and health care systems. By matching 3 out of these 4 factors (ie, social factors, health care system, and provider education), this study aims to compare treatment outcomes after chiropractic care between people with LBP in the Swiss-German and Swiss-French regions to see if patient cultural factors may be related to treatment outcomes.^{40,41}

METHODS

The present study is a secondary analysis of data from a prospective outcomes study comparing 2 cohorts of LBP patients presenting to chiropractors practicing in either the German- or French-speaking regions of Switzerland.

Patients

All active members of the Swiss Chiropractic Association were asked to participate in this study by sending them a notification by e-mail and presenting the study protocol at the annual continuing education convention. Sixty-three Swiss chiropractors contributed a total of 1101 patients with acute or chronic low back pain to this prospective cohort outcomes study with a follow-up of 1 year. Predictors of improvement after chiropractic treatment were previously published using this database, but patient language and location in either the German- or French-speaking regions of Switzerland were not factors included in that prediction

model.⁴² Patients were older than 18 years of age and had not received any chiropractic or manual therapy in the prior 3 months. They had to be fluent in either German or French. Exclusion criteria were pathologic conditions of the lumbar spine that are relative contraindications to chiropractic manipulative therapy, such as acute fractures, severe osteoporosis, infections, tumors, inflammatory entities, and Paget disease. The patients in the present study were divided into a Swiss-German and Swiss-French group according to the language spoken in the city where the chiropractor was practicing. Thirty-three patients had to be excluded because the 3 chiropractors who enrolled them for the study were bilingual and worked in a bilingual city.

Patients with missing data for some of the data collection time points were not excluded unless outcome data for 3 consecutive outcome time points were missing.

Treatment

Participating chiropractors were encouraged not to change their usual treatment methods because the goal was to evaluate the outcomes of routine chiropractic care. Techniques, length of appointment, and treatment numbers were not standardized. However, according to a published chiropractic job analysis in Switzerland the most popular therapies were “diversified” and “drop” techniques, trigger point therapy, and giving advice for daily living. Most chiropractors (58%) reported a consultation length of 11 to 15 minutes.⁴³

Outcome Measures

Outcomes after chiropractic intervention were measured several times during a 1-year follow-up period. Data collection for both language groups started at the same time point and lasted, in total, 5 years. Baseline data were collected by the participating chiropractors and office assistants in their practices directly before the first treatment. This included patient age, sex, Numeric Rating Scale (NRS) for pain score, Oswestry Disability Index (ODI) score, and duration of pain. To facilitate correct use of the outcome measurements, a workshop was performed at the annual Swiss chiropractic convention. The follow-up outcome data were collected at 1 week, 1 month, 3 months, 6 months, and 1 year after baseline measurements independent of chiropractic visits. Several trained research assistants from the chiropractic medicine department at the University of Zürich collected the data by telephone interviews, not knowing the patients or the referring chiropractors. Although the research assistants spoke either French or German to the patients when collecting the telephone data, they were blinded to the purpose of this study and the questions asked to each group were identical.

The follow-up outcome measures included the Patient Global Impression of Change (PGIC) scale as the primary outcome measure.⁴² The PGIC is a 7-item scale that includes factors such as overall improvement, quality of life, and activities of daily living. Responses include “much

better,” “better,” “slightly better,” “unchanged,” “slightly worse,” “worse,” and “much worse.” Only the responses “much better” and “better” were considered improved. Additionally the ODI, which has been validated in German and French, and the NRS for pain were collected as secondary outcome measures.^{44,45} The ODI data were only collected up to the 3-month time point.

Furthermore, social situation parameters, only collected at 6 months and 1 year, included acceptable quality of life, work without pain, off work last 3 months and level of satisfaction. The first 2 parameters were evaluated with yes-or-no questions, whereas the latter 2 provided more than 2 possible answers. For “off work last 3 months,” the options “yes,” “no,” “not working,” and “retired” were provided. For the evaluation of the “level of satisfaction,” possible answers were “very satisfied,” “satisfied,” “undecided” “dissatisfied,” and “very dissatisfied.”

Statistical Analyses

Statistical analyses were done within the scope of a prospective cohort design with a follow-up period of 1 year. Baseline parameters were obtained using descriptive statistics. To distinguish whether or not the continuous baseline data were normally distributed, a Kolmogorov-Smirnov test and Shapiro-Wilk test were performed and further analyzed using a box plot and histogram. For the normally distributed baseline data of patients’ characteristics, the Student *t* test for 2 independent samples was carried out to compare both language groups.

To assess the PGIC, NRS, and ODI values within 1 language group, first a descriptive statistic was used. The 7 possible responses of the PGIC score were dichotomized into “improved” (“much better” or “better”) and “not improved” (all other responses).⁴² Then these responses were compared between the Swiss-German and Swiss-French groups at all outcome time points using the χ^2 test. For the NRS and ODI change scores (baseline value – follow-up value) at all follow-up time points the Student *t* test was performed. Additionally, the proportion of patients “improved” for each adjacent time point was compared within each language group using the McNemar test. Finally, the NRS and ODI values for each adjacent time points were compared within each language group using the Wilcoxon test.

The social situation parameters, which were collected at 6 months and 1 year, were analyzed using descriptive statistics and the responses compared between the 2 language groups using the χ^2 test.

All analyses were carried out with the statistical software SPSS Version 22 (SPSS, Armonk, New York).

Ethics

Ethics approval was obtained from the Orthopaedic University Hospital of Balgrist ethics committee and the ethics committee of the Canton of Zürich in 2009. The

Table 1. Baseline Patient Characteristics^a

Variable	Swiss-German, n = 853	Swiss-French, n = 215	P
Sex			.060
Male	51.3%	50%	
Female	48.7%	50%	
Age, y	42.70 (±14.09)	45.11 (±15.84)	.029 ^a
NRS (SD)	5.79 (±2.18)	5.74 (±2.14)	.753
ODI total (SD)	13.018 (±7.84)	13.020 (±7.43)	.998
Duration			.178
Acute (0-4 wk)	56.3%	59.2%	
Subacute (4-12 wk)	15.5%	13.6%	
Chronic (>12 wk)	28.2%	27.2%	

ODI, Oswestry Disability Index; SD, standard deviation.

^a $P < .05$ is considered significant.

ethics number is EK-16/2009. A written informed consent was obtained from all patients.

RESULTS

In total, 63 Swiss chiropractors (doctors of chiropractic) participated in the study, of whom 51 were Swiss-German, and 12 were Swiss-French. The number of patients included in the study totaled 1068.

Baseline Patient Characteristics

The distribution of acute, subacute, and chronic patients did not differ significantly ($P = .178$) between the 2 groups (Table 1).

Assessment of Disability, Pain, and Improvement

The proportion of patients improved (according to PGIC results) for the German- and French-speaking patients is shown in Table 2 for all data collection points. There was no significant difference in the proportion of patients improved between the 2

groups at any of the data collection time points until 1 year, when the percentage of the German-speaking patients reporting clinically relevant improvement continued to increase, but fewer French-speaking patients were improved compared with their 6-month time point ($P = .01$). Reduction of pain over time (NRS change scores) also had no significant differences between the German- and French-speaking patients until the 1-year data collection time point. Once again, the German-speaking patients reported higher levels of pain reduction compared with the baseline scores ($P = .01$) (Table 2).

There were significant ($P < .05$) differences between the baseline NRS values and the follow-up values (ie, change scores) at all time points for both groups. When comparing the NRS values for each adjacent time point in order to track the course of the pain within each language group, the Swiss-German cohort had a significant pain reduction ($P < .05$) at each data collection time point until 6 months. For the Swiss-French cohort there was a significant pain reduction only until the 3-month time point, when it leveled off to the 6 month time point ($P = .81$). There was then a significant pain increase between the 6-month and 1-year time point ($P = .019$).

Disability was measured with the ODI after 1 week, 1 month, and 3 months. In both groups a significantly ($P < .05$) constant improvement of the ODI score over 3 months was observed, but no significant differences between both language groups were identified (Table 2).

Outcomes on Social Situations at 6 Months and 1 Year

Six months after the first chiropractic treatment patients were asked about 4 different parameters: acceptable quality of life, work without pain, off work last 3 months, and satisfaction level. "Acceptable quality of life" was significantly different ($P = .037$) between the Swiss-German and Swiss-French groups at 6 months, with a better outcome for the French-speaking patients (

Table 2. Disability, Pain, and Improvement

Time Elapsed and Test	Swiss-German Mean Score (SD)	Swiss-French Mean Score (SD)	P
1-wk PGIC improved	49.3%	58.8%	.070
1-wk NRS Δ	1.98 (±2.48) (n = 690)	2.06 (±2.46) (n = 157)	.709
1-wk ODI Δ	3.93 (±6.05) (n = 708)	4.10 (±6.83) (n = 166)	.762
1-mo PGIC improved	71.8%	73.7%	.215
1-mo NRS Δ	3.15 (±2.70) (n = 724)	2.99 (±2.79) (n = 172)	.502
1-mo ODI Δ	6.72 (±7.48) (n = 742)	6.78 (±7.68) (n = 179)	.923
3-mo PGIC improved	80.6%	75.3%	.287
3-mo NRS Δ	3.55 (±2.79) (n = 690)	3.49 (±2.93) (n = 159)	.812
3-mo ODI Δ	8.20 (±8.14) (n = 709)	7.64 (±8.12) (n = 167)	.424
6-mo PGIC improved	81.0%	80.1%	.929
6-mo NRS Δ	3.77 (±2.87) (n = 692)	3.54 (±3.02) (n = 152)	.372
1-y PGIC improved	83.5%	73.1%	.010 ^a
1-y NRS Δ	3.92 (±2.77) (n = 690)	3.28 (±3.00) (n = 163)	.010 ^a

NRS, Numeric Rating Scale for pain; ODI, Oswestry Disability Index; PGIC, Patient Global Impression of Change.

^a $P < .05$ is considered significant.

Table 3). In the other outcome parameters, no significant differences were identified between the 2 groups.

After 1 year the patients were asked the same questions as at 6 months, except the criteria “off work last 3 months,” which was changed into “off work last 6 months.” No significant differences were identified between the 2 language groups (Table 3).

DISCUSSION

The purpose of this study was to compare treatment outcome data up to a 1-year follow-up after chiropractic care between the German and French regions of Switzerland because not only does the language vary between the 2 regions but so does the culture and attitude towards LBP.^{19,39} No significant differences between language groups were found during the first 6 months in terms of the proportion of patients reporting clinically relevant improvement, disability, and pain scores. However, between the 6-month and 1-year time points the percentage of patients improved decreased for the French-speaking Swiss patients, whereas it continued to slightly increase for the German-speaking patients, suggesting that some of the French-speaking patients experienced a relapse. Related to this is the fact that the pain scores started to increase significantly again in the Swiss-French group between the 6-month and 1-year time points, whereas in the Swiss-German group they remained unchanged. Some of this difference could be due to the fact that there was a larger loss to follow-up rate for the French-speaking patients, particularly at 6 months. Perhaps patients with worse outcomes did not respond to the telephone calls at this time point, biasing the data. However, this would be unusual because other studies have reported that nonresponders to treatment are more likely to complete outcome measures.^{46,47}

Table 3. Social Situation Parameters

	Swiss-German		Swiss-French		P	
	6 mo	1 y	6 mo	1 y	6 mo	1 y
Acceptable quality of life					.037 ^a	.203
Yes	92.2%	92.9%	97.4%	96.4%		
No	7.8%	7.1%	2.6%	3.6%		
Work without pain					.261	.069
Yes	92.0%	90.4%	91.5%	90.5%		
No	8.0%	9.6%	8.5%	9.5%		
Off work last 3-6 mo					.129	.400
Yes	4.6%	5.5%	7.9%	5.4%		
No	82.8%	83.2%	75.7%	79.0%		
Not working	3.1%	2.0%	2.6%	2.4%		
Retired	9.5%	9.3%	13.8%	13.2%		
Satisfaction					.485	.984
Very satisfied	61.2%	62.0%	6.1%	59.5%		
Satisfied	27.9%	25.0%	25.5%	27.4%		
Undecided	7.4%	9.5%	11.8%	10.1%		
Dissatisfied	2.3%	2.5%	2.0%	1.8%		
Very dissatisfied	1.1%	1.0%	.7%	1.2%		

^a $P < .05$ is considered significant.

The assessment of “acceptable quality of life” revealed a significant difference between the 2 groups at 6 months but not at 12 months, with a better quality of life in the French-speaking region. Other social situation parameters influenced by LBP, such as “work without pain,” “off work last 3 [or 6] months,” and “satisfaction level,” did not identify any cultural differences.

Both language and cultural groups generally reported good outcomes after chiropractic care. Improvement in pain scores are comparable with other chiropractic outcome studies.⁴⁸ However, at 6 months in the Swiss-French group the pain levels started to increase again and the number of patients with significant improvement decreased. This may be explained with findings from a study by Schulz et al,¹⁹ who reported that LBP patients in the French part of Switzerland used predominantly passive coping strategies and expressed the feeling of being powerless concerning their LBP. In contrast they found that Swiss-German patients seem to have a more sustainable way of coping with LBP.¹⁹ However, this trend toward relapse could also be considered as part of the natural history of LBP or as a consequence of the significantly older age of the Swiss-French group.^{49,50}

Skovron et al⁹ performed a study on risk factors for the occurrence of LBP in a similar language setting in Belgium, comparing the Flemish- and French-speaking populations. In their observation the French language was a strong predictor for a “first episode of LBP” and “ever had LBP” but not “daily LBP.” The conclusion that the language-based cultural differences have an impact on LBP can be confirmed to some extent in our study, because we observed a higher rate of recurrence of LBP in the French-speaking group. In geographically very small countries such as Switzerland and Belgium, which contain dramatically diverse language and cultural regions, it is very unlikely that such differences in outcomes would be identified between cities in the same language or cultural part of the country compared with large countries with a single language.

Carey et al¹³ and Cedraschi et al²⁵ researched cultural influences on the outcomes of LBP. The first research group examined differences in pain levels, disability, work status, and diagnostic and therapeutic interventions as well as satisfaction between black and white patient groups over a follow-up period of 22 months while being under the care of a general practitioner, chiropractor, or orthopedic surgeon.¹³ Interestingly the black patient group started with a higher pain and disability level and had a less intensive diagnostic and therapeutic approach but a similar recurrence rate and the same “time off work” as the white patient group. Cedraschi et al²⁵ reported a better outcome for a back-school program if patients and providers’ cultural backgrounds were equal or nearly equal and if prior representations of back pain were taken into account.

An assessment of cultural influences on pain and especially LBP has been performed many times in the literature.⁵¹ However, using a sociocultural variable in epidemiologic studies can be very controversial and a breeding ground for racism.^{16,17,22,24,52} Several limitations have to be considered while studying this topic. To begin with, defining the boundaries of a culture is a very complex

issue. In the present study, the aspects of pain and disability after chiropractic treatment in a cultural context were analyzed using language regions in Switzerland, but the concern regarding the heterogeneity of variable subcultures remains. Both language regions have a large number of immigrants with different cultural backgrounds. Additionally, the differences between urban and rural areas were not taken into account. Furthermore, the identity of an individual and membership in a defined culture, especially within a multicultural society, is not always simple. Persons with 1 Swiss-French and 1 Swiss-German parent cannot be allocated easily to 1 language group. However, patients had to be fluent in either the French or German language in order to participate in the study. Therefore, many new immigrants would have been excluded.

For these reasons different authors plead for a careful use of cultural variables in research and clarity about the research purpose.^{16,17,52} Culture research should never give legitimization to the idea of the superiority of 1 group over another, but rather should help in understanding different views and identifying ways to cope with them.

Limitations and Strengths

Because this study had a large number of participants, there might be statistical limitations concerning significances as a result of sample size. It is easier to obtain statistical significance, which may not be clinically relevant, with large sample sizes.

A further limitation exists concerning the duration and number of treatments. To the authors' knowledge, no literature about differences in treatment numbers between the Swiss-German and Swiss-French parts of the country has been published so far. In addition, further possible confounding factors for LBP (eg, smoking or body mass index), were not taken into account.

One of the main strengths of this study is the setting in which it was performed. Switzerland, with its 4 language-based microcultures, is ideal for researching cultural influences on health issues, because further influencing variables, such as the social security system, educational level, and workplace distribution, are similar countrywide. Another locational benefit of researching chiropractic properties is the homogeneity of the professional education and similar treatment concepts because all Swiss chiropractors are required to complete a full-time, 2.5-year postgraduate program, which is standardized across all cultural regions of the country.⁴³ Thus, this investigation is able to identify some regional variations in patient outcomes after chiropractic care that should not be related to significant practitioner variability.

CONCLUSIONS

Treatment outcome results after chiropractic care are comparable in the German- and French-speaking regions of Switzerland until sometime between the 6-month and 1-year time points, when people in the French-speaking region are

more likely to relapse. Together with findings from previous research, this study illustrates the similarities and differences between a Swiss-German and Swiss-French patient group as an example of culture-based influences on LBP.^{19,37,39} Putting this evidence into practice, the health care providers could encourage especially those in the French-speaking region to undertake secondary prevention measures and highlight the importance of an active way of coping with LBP.

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No funding sources or conflicts of interest were reported for this study.

CONTRIBUTORSHIP INFORMATION

Concept development (provided idea for the research): C.P.

Design (planned the methods to generate the results): D.G., C.P., B.K.H.

Supervision (provided oversight, responsible for organization and implementation, writing of the manuscript): C.P., B.K.H.

Data collection/processing (responsible for experiments, patient management, organization, or reporting data): C.P.

Analysis/interpretation (responsible for statistical analysis, evaluation, and presentation of the results): D.G.

Literature search (performed the literature search): D.G.

Writing (responsible for writing a substantive part of the manuscript): D.G.

Critical review (revised manuscript for intellectual content, this does not relate to spelling and grammar checking): C.P., B.K.H.

Practical Applications

- There were no differences in treatment outcomes between the French and German speaking Swiss up to the 6 month data collection time point.
- At the 1 year time point the percentage of French speaking Swiss who were significantly improved decreased while the percentage of German speaking Swiss who improved continued to increase.
- The French-speaking Swiss also had lower levels of pain reduction at 1 year compared to the German speaking Swiss suggesting that they were more likely to relapse.

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