CORE
Metadata, citation and similar papers at core.ac.uk

doi: 10.3325/cmj.2010.51.237

Effects of Training Program on Recognition and Management of Depression and Suicide Risk Evaluation for Slovenian Primary-care Physicians: Follow-up Study

Saška Roškar[1], Anja Podlesek[2], Maja Zorko[1], Rok Tavčar[3], Mojca Zvezdana Dernovšek[3], Urban Groleger[3], Milan Mirjanič[4], Nuša Konec[5], Evgen Janet[6], Andrej Marušič[4*]

[1]Institute of Public Health of the Republic of Slovenia, Ljubljana, Slovenia

[2]Department of Psychology, Faculty of Arts, University of Ljubljana, Ljubljana, Slovenia

[3]Psychiatric Clinic Ljubljana, Ljubljana, Slovenia

[4]PINT, University of Primorska, Koper, Slovenia

[5]Institute of Public Health, Celje, Slovenia

[6]Institute of Public Health, Ravne na Koroškem, Slovenia

*Late Prof. Andrej Marušič was the initiator of the study.

Aim To implement and evaluate an educational program for primary care physicians on recognition and treatment of depression and suicide prevention.

Method The study was conducted in 3 Slovenian neighboring regions (Celje, Ravne na Koroškem, and Podravska) with similar suicide rates and other health indicators. All primary care physicians from Celje (N = 155) and Ravne na Koroškem (N = 35) were invited to participate in the educational program on depression treatment and suicide risk recognition. From January to March 2003, approximately half of them (82 out of 190; educational group) attended the program, whereas the other half (108 out of 190; control group 1) and physicians from the Podravska region (N = 164; control group 2) did not attend the program. The prescription rates of antidepressants and anxiolytics before and after the intervention were compared between the studied regions. Also, suicide rates three-years before and after the intervention were compared.

Results From 2002 to 2003, there was a 2.33-fold increase in the rate of antidepressant prescriptions in the educational group ($P < 0.05$) and only 1.28-fold ($P < 0.05$) and 1.34-fold ($P < 0.05$) increase in control groups 1 and 2, respectively. However, the 12% decrease in suicide rate in the intervention regions was not significantly greater than the 4% decrease in the non-intervention region ($P > 0.05$).

Conclusion Our training program was beneficial for primary care physicians' ability to recognize and manage depression. However, there was no significant decrease in local suicide rates.

Received: January 13, 2010

Accepted: April 23, 2010

Correspondence to:
Saška Roškar
Trubarjeva 2
1000 Ljubljana, Slovenia
saska.roskar@ivz-rs.si

Slovenia is an example of a high suicide rate country, with between 25 and 30 suicides per 100 000 population (years 2000-2006). The suicide rate is highest in the northeastern part of the country and gradually decreases toward the southeast. Such uneven distribution pattern is similar to the situation in Europe (1).

Suicidal behavior often manifests in people with mental illness, mostly depression (2). If depression is not recognized in primary care setting (3,4), it can deteriorate and subsequently lead to a development of suicidal behavior. Most persons who engaged in suicidal behavior had had contact with a primary care physician within a month prior to death (5-7), which suggests that education of primary care physicians on depression could contribute to suicide prevention. The first study on education of general practitioners on depression, conducted in 1983 in the Swedish island of Gotland, increased the prescription of antidepressants and decreased the prescription of anxiolytics (8-9). Furthermore, it decreased the number of women's suicides by two thirds, whereas the number of men's suicides remained more or less the same (10-12). Since then, many replications of the study have been done, with different outcomes. Similar programs have increased the prescription of antidepressants and substantially decreased suicide rates, eg, in some regions of Sweden (11,12), Hungary (13), and Japan (14). Furthermore, education programs for primary care physicians have improved the detection and treatment of depression in the UK (15), Australia (16), US (17), and the Northern Ireland (18). Studies in some other countries, such as Brazil (19), UK (20), and the USA (21), have failed to confirm a beneficial effect of such programs. Other forms of community-based intervention programs have also been effective in reducing the suicide rate and improving care for patients with depression. European Alliance Against Depression, which besides co-operation with primary care physicians included public relations effort, co-operation with professionals (priests, teachers, pharmacists, etc), and help for patients and their relatives showed a significant reduction in suicide rate by about 20%, both with respect to a 1-year-baseline and the control region (22).

Primary care physicians were chosen as the target group for our program because in the Slovenian health care system they have a gatekeeping role of referring patients to specialists. The aim of our study was to develop, follow-up, and measure the effects of primary-care physicians' training on recognition and management of depressive disorder and evaluation of suicide risk. The effects were divided into short-term ones, like improvement in the ways of prescribing antidepressants and anxiolytics, and long-term ones, like a potential decrease in the local suicide rates.

METHODS

The study was conducted in 3 Slovenian neighboring regions, Podravska, Savinjska, and Koroška, with the highest suicide rates in Slovenia and similar health indicators (Table 1). These regions were also chosen due to shortage of outpatient psychiatric services, which is why the treatment of patients with mental disorders there relies more on primary care physicians.

TABLE 1. Basic statistical data for three Slovenian regions included in the study (www.stat.si)

Region	Average annual suicide rate (2000-2002)*	Population	GDP (level index†)	Area (km^2)
Podravska	31.7	319 235	84.5	2170
Savinjska	34.7	257 375	89.2	2383
Koroška	39.2	73 745	77.5	1041

*Average annual suicide rate in Slovenia in the same period was 28.5.
†Average gross domestic product (GDP) level index for Slovenia is 100.

Education program

From January to March 2003, 68 out of 155 primary care physicians from Savinjska and 14 out of 35 primary care physicians from Koroška region completed a 4-hour educational program. The program consisted of two lectures providing theoretical information about depression and suicide (etiology, prevalence, etc) and practical guidelines about treatment of depression. The lectures were followed by a longer workshop including a role play between a physician and a depressive/suicidal patient. The aim of the workshop was to train the physician how to ask the patients about their symptoms in order to ensure a more accurate diagnosis, ensure patients' compliance, recognize and ask about suicidal thoughts, make an anti-suicide pact, design the follow-up treatment, etc. The overall attendance rate to the educational program in the two regions was 43%. The group of physicians attending the educational program (the educational group, n = 82) was compared with two groups: the group of physicians from the same regions not attending the program (control group 1, n = 108) and the group of physicians from Podravska region not attending the program (n = 164) (control group 2). The inclusion criteria were working in primary care as a primary care specialist and prescribing at least 5 prescriptions of antidepressants at the baseline period (March-December 2002).

Data analysis and statistics

The statistical analyses were based on the number of outpatient clinic prescriptions of psychotropic medications (antidepressants and anxiolytics as sorted according to the Anatomical Therapeutic Chemical Classification system – N06A, N05B) from primary care physicians in Slovenia. The baseline measurement of prescription rates was carried out before the training, from March to December 2002, and another measurement was carried out after the training, from March to December 2003 to examine the effect of the education program. For each primary care physician we calculated (i) the ratio of antidepressants prescribed before and after the training (the number of prescribed drugs after the training was divided by the number of prescribed drugs before the training) and (ii) the ratio of anxiolytics prescribed before and after the training. The ratio >1.0 indicated that more drugs of a certain type were prescribed after the training, while the ratio <1.0 indicated that more drugs were prescribed before the training. The ratio of the two values (comparison between the years 2002 and 2003) was chosen instead of the difference between the years because there was a large variability among the physicians in the baseline amount of prescribed drugs. Analysis of variance was used to compare the ratios in the three groups.

Distributions of the variables were positively skewed and Kolmogorov-Smirnov test showed significant declines from the normal distribution. This is why we used the bias-corrected and accelerated bootstrap approach (23) in SPSS/PASW 18.0 (SPSS Inc., Chicago, IL, USA) with 1000 generated samples for assessing the 95% confidence intervals of different statistics (bias-corrected and accelerated 95% CI).

A χ^2 test with continuity correction was used to compare the number of suicides in the studied regions between two periods: 2000-2002 period (the period before the intervention) and 2004-2006 period (the period after the intervention). Hence, the 3 years before the intervention (2000-2002) represented a baseline period, and the 3 years after the intervention (2004-2006) represented a period with a possible effect of education program, indicated with a decrease in the number of suicides in the intervention regions, but not in the control region. All the hypotheses were tested at the α error rate of 0.05.

TABLE 2. Baseline levels for the three groups in the number of antidepressants and anxiolytics prescriptions

Drugs	No.	Median (BCa 95% CI)*
Antidepressants:		
educational group	82	57.0 (76.1-128.3)
control group 1	108	56.0 (63.3-96.3)
control group 2	164	55.5 (72.8-111.5)
Anxiolytics:		
educational group	82	661.0 (745.3-1045.7)
control group 1	108	666.5 (738.8-1061.2)
control group 2	164	694.0 (730.8-1008.7)

*BCa 95% CI – 95% confidence interval derived with bias-corrected and accelerated bootstrap approach (23).

RESULTS

Prior to our study, primary care physicians from different groups did not prescribe significantly different number of antidepressants (for descriptive statistics see Table 2) ($F[2, 351] = 0.91$, $P = 0.403$, mean square error = 12 083.96, partial $\eta^2 = 0.01$, power = 0.207) or anxiolytics ($F[2, 351] = 0.08$, $P = 0.920$, mean square error = 633 547.05, partial $\eta^2 = 0.00$, power = 0.063).

After the training, there was a significant increase in the number of antidepressant prescriptions in all three groups (Table 3; average ratios and their confidence intervals in all the groups were above 1.0). Whereas the average in-

TABLE 3. Descriptive statistics for the ratio of the number of drugs prescriptions after and before the educational training

Drugs	No.	Mean	Bias for mean	Standard deviation	Standard error	BCa 95% CI*
Antidepressants:						
educational group	82	2.33	0.01	3.04	0.34	1.81-3.03
control group 1	108	1.28	0.00	1.43	0.14	1.05-1.55
control group 2	164	1.34	0.00	1.51	0.12	1.15-1.60
Anxiolytics:						
educational group	82	1.51	-0.01	2.44	0.27	1.08-2.02
control group 1	108	0.86	0.00	0.71	0.07	0.75-1.00
control group 2	163	1.25	-0.01	3.62	0.28	0.91-1.83

*BCa 95% CI – 95% confidence interval derived with bias-corrected and accelerated bootstrap approach (23).

TABLE 4. Reduction of the number of suicides in the three-year period after the intervention as compared with the three-year period before the intervention (observed in the intervention regions and the control region)*

	Men		Women		Total	
Year	interventional regions	control region	interventional regions	control region	interventional regions	control region
2000	99	78	39	31	138	109
2001	107	84	22	16	129	100
2002	107	76	25	19	132	95
2003	123	93	17	26	140	119
2004	102	67	33	22	135	89
2005	76	72	22	30	98	102
2006	95	76	24	26	119	102
Total 2000-2002	313	238	86	66	399	304
Total 2004-2006	273	215	79	78	352	293
Change in percents	-13	-10	-8	18	-12	-4

*Data were obtained from the Mortality database at Institute of Public Health of the Republic of Slovenia.

crease in the rate of prescribed antidepressants was 28% in the control group 1 and 34% in the control group 2, it was as much as 133% in educational group. The analysis of variance showed a significant effect of the group on the ratio of antidepressant prescriptions ($F[2, 351] = 8.51$, $P \leq 0.001$, mean square error = 32.41, adjusted $R^2 = 0.05$, power = 0.97). Post-hoc tests did not show a significant difference between the control group 1 and control group 2 (mean difference = -0.06, bias = 0.00, standard error [SE] = 0.18, bias-corrected and accelerated 95% CI = -0.29, 0.43). The difference between educational group and control group 1 was significant (mean difference = 1.05, bias-corrected and accelerated 95% CI = 0.47, 1.80, bias = 0.01, SE = 0.36) and so was the difference between educational group and control group 2 (mean difference = 0.99, bias-corrected and accelerated 95% CI = 0.40, 1.69, bias = 0.01, SE = 0.36). To sum up, even though the antidepressants prescription rate increased in all the studied groups, the increase was significantly higher in the educational group than in the two control groups.

There was also an increase in the number of prescribed anxiolytics in the educational group – the average increase in the rate of prescribed anxiolytics was 51% and the ratio of prescriptions after and before the training was significantly greater than 1.0 (Table 3). In the control group 2, the increase in the number of prescribed anxiolytics did not reach significance. In the control group 1, the number of prescribed anxiolytics decreased by 14%, and this decrease was significant. The analysis of variance, however, did not show the ratios in the three groups to be significantly different ($F[2, 350] = 1.34$, $P = 0.264$, mean square error = 7.60, adjusted $R^2 = 0.00$, power = 0.29) (Table 4).

The 12% decrease in the number of suicides between the two observation periods in the intervention regions was not significantly larger than the 4% decrease in the control region ($\chi^2_1 = 0.56$, $P = 0.453$, power = 0.58; see Table 4 for frequencies). When the samples were divided according to sex, although there was a tendency toward a greater decrease in number of suicides in the intervention regions than in the control region, the regional differences remained non-significant: for men ($\chi^2_1 = 0.05$, $P = 0.828$, power = 0.44) and for women ($\chi^2_1 = 0.98$, $P = 0.323$, power = 0.63).

DISCUSSION

Our training program on depression and suicide for primary care physicians increased the number of prescribed antidepressants, but also unexpectedly increased the number of prescribed anxiolytics in the intervention group. However, the increase in the number of prescribed anxiolytics was not as large as the number of prescribed antidepressants.

The increase in the number of prescribed antidepressants in the intervention group in comparison with the control group is very encouraging. It indicates that primary care physicians are no longer only "symptom focused" and, besides previously preferred anxiolytics, they prescribe more antidepressants or a combined antidepressant/anxiolytics therapy.

Even though our study was systematically conducted and planned (every primary care physician from the intervention regions was invited to take part in the educational program), we were not able to prevent the participants

from attending other similar educational programs (organized by pharmaceutical companies, medical chamber, etc.). Therefore, our results may not be exclusively attributable to our program but may also reflect the impact of educational programs provided by other sources. This could explain the finding that the antidepressants prescription increase was noticed in all three groups of primary care physicians rather than in the educational group only. Physicians from both intervention regions also underwent another educational program on depression and suicide (within a project called European Alliance Against Depression) shortly after our training program. This can explain the increase in antidepressant prescriptions in the physicians from the intervention region who did not attend our educational program. Besides, the physicians might have obtained information about the content of our program from their colleagues.

Although the study was conducted several years ago and many things might have changed since, we believe that it is still relevant today, as primary care physicians are important gatekeepers in regard to depressive disorder and suicidal behavior.

Some of the studies that have reported increased prescription of antidepressants also have reported a decline in suicide rates (11-14). Although we did record a larger increase in antidepressant prescriptions in the educational group than in the control group 2, we did not record a significantly different decrease in the suicide number either in the intervention or the control regions. From the clinical point of view, the absolute number of suicides was much lower in the intervention regions, but the decrease was not large enough to detect the actual effect. This can perhaps be explained by the fact that primary care physicians who did not attend our educational program (ie, physicians included in the control group 1) did not increase the number of antidepressant prescriptions as much as those in the educational group, so the overall effect of the increase in antidepressants prescription rate was not high enough in the intervention regions, or at least it was not a lot higher in the intervention regions than in the control region.

Even though we did not find a significant decrease in the number of suicides in the intervention regions and this result may seem discouraging at first sight, such a short intervention in a small group of physicians could have hardly produced a strong effect. Besides that, in the field of suicide prevention even a slight move toward the desired effect can be encouraging.

To be able to draw more valid conclusions on the impact of the educational program on the number of suicides, it is necessary to conduct similar programs in a specific region for a longer period of time. Since educational programs for primary care physicians are only a part of suicide prevention, it seems reasonable to ensure booster sessions on the same topic (9), where primary care physicians could update their knowledge and skills on how to recognize and treat a suicidal patient. Focusing on primary care physicians for suicide prevention is necessary but other primary health care workers must also be included. We must also be aware of the time and provision restraints within general practices. Some studies found systematic collaboration between general practitioners and nurses, such as nurse telehealth care (24) or telephone care management with structured cognitive-behavioral psychotherapy (25) feasible as they fit well within the busy primary care setting (26).

Despite the mentioned shortcomings, the results are encouraging as our study confirms the previously reported positive effects of educational programs on antidepressant prescription (15-18). This leads us to believe that such programs are necessary in order to ensure an adequate depression treatment.

Acknowledgment

The research was supported by the Slovenian research agency (grant No. L3-4209).

References

1 Marusic A. Suicide mortality in Slovenia: regional variation. Crisis. 1998;19:159-66. Medline:10331313

2 Bostwick JM, Pankratz VS. Affective disorders and suicide risk: a reexamination. Am J Psychiatry. 2000;157:1925-32. Medline:11097952 doi:10.1176/appi.ajp.157.12.1925

3 Hirschfeld RM, Keller MB, Panico S, Arons BS, Barlow D, Davidoff F, et al. The National Depressive and Manic-Depressive Association consensus statement on the undertreatment of depression. JAMA. 1997;277:333-40. Medline:9002497 doi:10.1001/jama.277.4.333

4 Goldman LS, Nielsen NH, Champion HC. Awareness, diagnosis, and treatment of depression. J Gen Intern Med. 1999;14:569-80. Medline:10491249 doi:10.1046/j.1525-1497.1999.03478.x

5 Luoma JB, Martin CE, Pearson JL. Contact with mental health and primary care providers before suicide: a review of the evidence. Am J Psychiatry. 2002;159:909-16. Medline:12042175 doi:10.1176/appi.ajp.159.6.909

6 Andersen UA, Andersen M, Rosholm JU, Gram LF. Contacts to the health care system prior to suicide: a comprehensive analysis

using registers for general and psychiatric hospital admissions, contacts to general practitioners and practising specialists and drug prescriptions. Acta Psychiatr Scand. 2000;102:126-34. Medline:10937785 doi:10.1034/j.1600-0447.2000.102002126.x

7 Rodi PM, Roskar S, Marusic A. Suicide victims' last contact with the primary care physician: report from Slovenia. Int J Soc Psychiatry. 2010;56:280-7. Medline:19592448 doi:10.1177/0020764009105330

8 Rutz W, Carlsson P, von Knorring L, Walinder J. Cost-benefit analysis of an educational program for general practitioners by the Swedish Committee for the Prevention and Treatment of Depression. Acta Psychiatr Scand. 1992;85:457-64. Medline:1642130 doi:10.1111/j.1600-0447.1992.tb03212.x

9 Rutz W. Prevention of suicide and depression. Nord J Psychiatry. 1996;50 Suppl 37:61-7. doi:10.3109/08039489609099732

10 Rutz W, Walinder J, Pihlgren H, von Knorring L, Rihmer Z. Lessons from the Gotland study on depression, suicide and education: Effects, shortcomings and challenge. Int J Methods Psychiatr Res. 1996;6:S9-14.

11 Rutz W, von Knorring L, Walinder J. Frequency of suicide on Gotland after systematic postgraduate education of general practitioners. Acta Psychiatr Scand. 1989;80:151-4. Medline:2801163 doi:10.1111/j.1600-0447.1989.tb01318.x

12 Rutz W. Preventing suicide and premature death by education and treatment. J Affect Disord. 2001;62:123-9. Medline:11172879 doi:10.1016/S0165-0327(00)00356-6

13 Rihmer Z, Belso N, Kalmar S. Antidepressants and suicide prevention in Hungary. Acta Psychiatr Scand. 2001;103:238-9. Medline:11240584

14 Takahashi K, Naito H, Morita M, Suga R, Oguma T, Koizumi T. Suicide prevention for the elderly in Matsunoyama Town, Higashikubiki County, Niigata Prefecture: psychiatric care for elderly depression in the community [in Japanese]. Seishin Shinkeigaku Zasshi. 1998;100:469-85. Medline:9778997

15 Hannaford PC, Thompson C, Simpson M. Evaluation of an educational programme to improve the recognition of psychological illness by general practitioners. Br J Gen Pract. 1996;46:333-7. Medline:8983250

16 Naismith SL, Hickie IB, Scott EM, Davenport TA. Effects of mental health training and clinical audit on general practitioners' management of common mental disorders. Med J Aust. 2001;175 Suppl:S42-7. Medline:11556436

17 Pignone MP, Gaynes BN, Rushton JL, Burchell CM, Orleans CT, Mulrow CD, et al. Screening for depression in adults: a summary of the evidence for the U.S. Preventive Services Task Force. Ann Intern Med. 2002;136:765-76. Medline:12020146

18 Kelly C. The effects of depression awareness seminars on general practitioners knowledge of depressive illness. Ulster Med J. 1998;67:33-5. Medline:9652197

19 Valentini W, Levav I, Kohn R, Miranda CT, Mello AA, Mello MF, et al. An educational training program for physicians for diagnosis and treatment of depression [in Portuguese]. Rev Saude Publica. 2004;38:522-8. Medline:15311292

20 Thompson C, Kinmonth AL, Stevens L, Peveler RC, Stevens A, Ostler KJ, et al. Effects of a clinical-practice guideline and practice-based education on detection and outcome of depression in primary care: Hampshire Depression Project randomised controlled trial. Lancet. 2000;355:185-91. Medline:10675118 doi:10.1016/S0140-6736(99)03171-2

21 Lin EH, Simon GE, Katzelnick DJ, Pearson SD. Does physician education on depression management improve treatment in primary care? J Gen Intern Med. 2001;16:614-9. Medline:11556942 doi:10.1046/j.1525-1497.2001.016009614.x

22 Hegerl U, Schäfer R. From the Nuremberg Alliance Against Depression to a European network (EAAD) – extending community-based awareness-campaigns on national and European level [in German]. Psychiatr Prax. 2007;34 Suppl 3:S261-5. Medline:17786879 doi:10.1055/s-2007-986172

23 Efron B. Better bootstrap confidence intervals. J Am Stat Assoc. 1987;82:171-85. doi:10.2307/2289144

24 Hunkeler EM, Meresman JF, Hargreaves WA, Fireman B, Berman WH, Kirsch AJ, et al. Efficacy of nurse telehealth care and peer support in augmenting treatment of depression in primary care. Arch Fam Med. 2000;9:700-8. Medline:10927707 doi:10.1001/archfami.9.8.700

25 Simon GE, Ludman EJ, Tutty S, Operskalski B, Von Korff M. Telephone psychotherapy and telephone care management for primary care patients starting antidepressant treatment: a randomized controlled trial. JAMA. 2004;292:935-42. Medline:15328325 doi:10.1001/jama.292.8.935

26 Szanto K, Kalmar S, Hendin H, Rihmer Z, Mann JJ. A suicide prevention program in a region with a very high suicide rate. Arch Gen Psychiatry. 2007;64:914-20. Medline:17679636 doi:10.1001/archpsyc.64.8.914