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# Use of a personalised depression intervention in primary care to prevent anxiety:

## a secondary study of a cluster randomised trial


## Abstract

**Background**
In the predictD-intervention, GPs used a personalised biopsychosocial programme to prevent depression. This reduced the incidence of major depression by 21.0%, although the results were not statistically significant.

**Aim**
To determine whether the predictD-intervention is effective at preventing anxiety in primary care patients without depression or anxiety.

**Design and setting**
Secondary study of a cluster randomised trial with practices randomly assigned to either the predictD-intervention or usual care. This study was conducted in seven Spanish cities from October 2010 to July 2012.

**Method**
In each city, 10 practices and two GPs per practice, as well as four to six patients every recruiting day, were randomly selected until there were 26–27 eligible patients for each GP. The endpoint was cumulative incidence of anxiety as measured by the PRIME-MD screening tool over 18 months.

**Results**
A total of 3326 patients without depression and 140 GPs from 70 practices consented and were eligible to participate; 328 of these patients were removed because they had an anxiety syndrome at baseline. Of the 2998 valid patients, 2597 (86.6%) were evaluated at the end of the study. At 18 months, 10.4% (95% CI = 8.7% to 12.1%) of the patients in the predictD-intervention group developed anxiety compared with 13.1% (95% CI = 11.4% to 14.8%) in the usual-care group (absolute difference = –2.7% [95% CI = –5.1% to –0.3%]; $P = 0.029$).

**Conclusion**
A personalised intervention delivered by GPs for the prevention of depression provided a modest but statistically significant reduction in the incidence of anxiety.


**Keywords**
anxiety; controlled clinical trial; depression; primary care; primary prevention.

## INTRODUCTION

The average 12-month prevalence of anxiety disorders is 6.7% in the general population,[1] reaching 18.5% in patients in primary care.[2] Between 2007 and 2017, the burden of disease in terms of years lived with disability attributable to anxiety disorders increased by 12.4% and 13.6% for females and males, ranking eighth and 13th in the world, respectively.[3] Although treatments for anxiety disorders are effective,[4] not everyone with anxiety will receive appropriate treatment.[5] Moreover, treatment alone is not sufficient to eliminate the disease burden imposed by anxiety disorders.[6] It will be very difficult to decrease this burden unless the incidence of new cases is reduced, and this is only possible through primary prevention.

Psychological and/or educational interventions are effective at preventing anxiety disorders.[7] Most preventive programmes delivering cognitive behaviour therapy have been carried out in an academic setting and administered by psychologists. Four trials on anxiety prevention have been conducted in primary care, and only two implemented by GPs.[7] The primary healthcare setting is ideal for preventing the onset of illnesses, such as anxiety disorders, because it is easily accessible, provides continuity of care, and is used by a large proportion of the population.[8,9] To the authors' knowledge, there are no interventions administered by GPs to prevent the onset of anxiety disorders in the adult population irrespective of people's individual risk levels (universal prevention).[7,10]

Anxiety and depression frequently occur together,[11] share most of the same risk factors,[12–14] and respond to the same treatments[15] and preventive interventions.[16,17] The authors' research group (the predictD group) developed a personalised novel biopsychosocial intervention, the predictD-intervention, based on the patient's individual level of risk and risk profile of depression, which can be implemented by GPs to

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## How this fits in

To date, very few studies on the prevention of anxiety have been conducted in primary care and only two of these interventions were performed by GPs. In the predictD-intervention, the GP informed each patient about their level of risk (probability) and specific risk factors for depression, and they agreed on a personalised biopsychosocial intervention to prevent depression (constituting different strategies for dealing with the risk factors of each patient and encouraging them to have healthy lifestyle habits and promote their personal resources). The predictD-intervention reduced the occurrence of new cases of major depression compared with usual GP care, although this reduction was modest. This secondary study showed that the predictD-intervention also had a modest effect in preventing anxiety at 18 months. The predictD-intervention seems promising, although further studies are needed to confirm and even improve these results.

prevent the onset of major depression.[18] This intervention provided a modest reduction in the incidence of major depression compared with usual care.[19] It was not statistically significant, but it had a relevant cost utility.[20] The aim of this secondary study was to assess whether the predictD-intervention for the prevention of depression was effective at preventing anxiety in patients in primary care who did not have depression or anxiety.

## METHOD

### Design and setting

The predictD-Cluster, Controlled, Randomised Trial (predictD-CCRT)[18] had two parallel groups (the predictD-intervention and usual care), with cluster assignment by practice, and 18-month follow-up. It was conducted in seven Spanish cities (Malaga, Granada, Jaen, Saragossa, Salamanca, Bilbao, and Barcelona) between October 2010 and July 2012.

The Spanish National Health Service provides universal health coverage for citizens through a public system financed by taxes and is free at the point of use. Each patient is assigned to only one GP, who functions as a gatekeeper to the wider system. Patients can visit their GP as often as they want without having to pay for consultations, even when they do so for preventive reasons. Details of the trial design are provided elsewhere.[18–20]

### Participants

Ten practices in each city and two GPs in each practice were randomly selected using closed opaque envelopes by an independent investigator who was centrally located but not part of the research team.

Four to six patients per day were randomly selected from among the patients who had recently been seen at the practices by independent research assistants using random numbers. GPs reviewed the lists of patients to identify those who met the exclusion criteria. This process continued until there were 26 to 27 eligible patients for each GP. The recruitment was performed from October 2010 to February 2011. All eligible patients were invited to participate, and those who agreed to do so were informed about the study by research assistants. Exclusion criteria for patients were age <18 or >75 years; inability to understand or speak Spanish; documented severe mental disorder (such as psychosis, bipolar disorder, or personality disorder), cognitive impairment, or terminal illness; being scheduled to be out of the city more than 4 months during the 18 months of follow-up; and representatives attending the surgery on behalf of the patient. Trained and independent interviewers administered the Composite International Diagnostic Interview (Depression section)[21,22] at baseline, and patients with a diagnosis of major depression during the previous 6 months were also excluded from the trial. For this secondary study, patients were removed if they had an anxiety syndrome in the previous 6 months, according to the Primary Care Evaluation of Mental Disorders (PRIME-MD-anxiety) questionnaire.[23,24]

### Randomisation and blinding

In each city, five practices were assigned to the control group and five to the intervention group. This random allocation was achieved using closed opaque envelopes by an independent investigator who was centrally located but not part of the research team. GPs and patients were not blind to group allocations. The interviewers who assessed outcomes and investigators who did the statistical analyses were blinded to group allocations.

### Intervention

The predictD-intervention has been described in detail elsewhere.[18,19] Before delivering the intervention, GPs attended a 10- to 15-hour training workshop (see Supplementary Annex S1 for details). GPs communicated to each patient their risk factors for depression and overall probability of developing depression using the Spanish version of the predictD algorithm[12,25] (http://www.predictplusprevent.com/Calculadora.

php?idioma=en). They then gave patients a patient-oriented booklet about preventing depression; enabling patients to actively deal with their risk factors, and feel empowered; and constructed a tailored biopsychosocial intervention for each patient to prevent depression (see Supplementary Annex S2 for details about the different components of the predictD intervention, and Supplementary Figure S1 for a theoretical model for the prevention of depression in primary care). GPs were given recommendations for conducting a GP–patient interview to prevent depression (see Supplementary Box S1 for details) and were directed to a 5-minute video showing a GP delivering an intervention online (see Supplementary Figure S2 for an example of the mechanisms provided by the GP to reduce the likelihood of becoming depressed after the intervention). GPs delivered interventions to patients at baseline and at 6- and 12-month follow-up visits, which each lasted 10–15 minutes. Patients in the predictD-intervention group also continued to receive usual care.

GPs in the control group did not receive information about their patients' profiles and levels of risk, nor did they attend the training workshop. Patients in the control group continued to receive usual care, and were assessed for depression, anxiety, and other information at the same intervals as patients in the intervention group.

### Outcomes

The endpoint of the predictD-CCRT study was cumulative incidence of major depression at 18 months. The endpoint for this secondary study was the cumulative incidence of anxiety syndromes at 18 months measured at 6, 12, and 18 months using the PRIME-MD questionnaire.[23] The Spanish version of PRIME-MD can classify patients who test positive for panic attacks, generalised anxiety, and other anxiety syndromes.[24] A dichotomous anxiety variable was used to indicate when any of the three anxiety syndromes are present in a given patient. The cumulative incidence of anxiety syndromes was also evaluated at 6 and 12 months. It should be noted that the PRIME-MD instrument is not recorded on ClinicalTrials.gov as a secondary outcome; however, it can be found in the protocol publication of this study.[18] Additional information collected from patients, GPs, and practices is described in detail elsewhere (see Supplementary Annex S3 for a summary).[18–20] All patient variables were assessed at baseline and at 6, 12, and 18 months in both study groups. GPs participating in the trial completed a self-administered questionnaire at baseline.

### Statistical analysis

All analyses were performed using Stata (version 13.1) and participants were analysed according to their randomised group. The cumulative incidence of anxiety at 18 months in each study group was compared using generalised estimating equations to account for the cluster randomised design, with multiple imputation to account for missing outcomes. Generalised estimating equations were fitted with a binomial-family, logit-link function; terms for intervention group and baseline probability of depression were included; and an exchangeable correlation structure and robust standard errors were included for clustering on practice, whose intraclass correlation coefficient was 0.029. The statistical power of the secondary study sample was calculated a posteriori, and was 33.2% (rho = 0.029; alpha = 0.05; incidence difference = –0.0267, N1 = 1514, N2 = 1484, number of clusters K1 = 35 and K2 = 35, average number of patients per cluster M1 = 43.26 and M2 = 42.4). It was decided a priori to adjust for baseline probability of depression[18] because it was considered strongly predictive of the outcome and thus clinically prognostic.[26,27] Standardised probabilities of anxiety during the 18-month study were calculated using the margins in Stata. Missing outcomes were accounted for using multiple imputations with chained equations,[28] under a missing-at-random framework. Fifty imputed samples were generated and estimates were combined using Rubin rules.[29]

Sensitivity analysis included the unadjusted incidence of anxiety at 18 months; and the incidence of anxiety at 18 months adjusted for all unbalanced variables. Supplementary analyses were also carried out to evaluate the cumulative incidence of anxiety at 6 and 12 months.

All *P*-values were two-sided and considered significant at ≤0.05. All confidence intervals (CI) were reported at 95%.

## RESULTS

Eligible patients at each stage of the study up to 18 months are shown in Figure 1 (see Supplementary Figure S3 for selection of primary care centres and GPs). A total of 68.7% (*n* = 1889) patients agreed to participate in the control group, and 76.1% (*n* = 1894) agreed to participate in the intervention group. Of the 1453 patients who declined to participate, 72.1% (*n* = 1048),

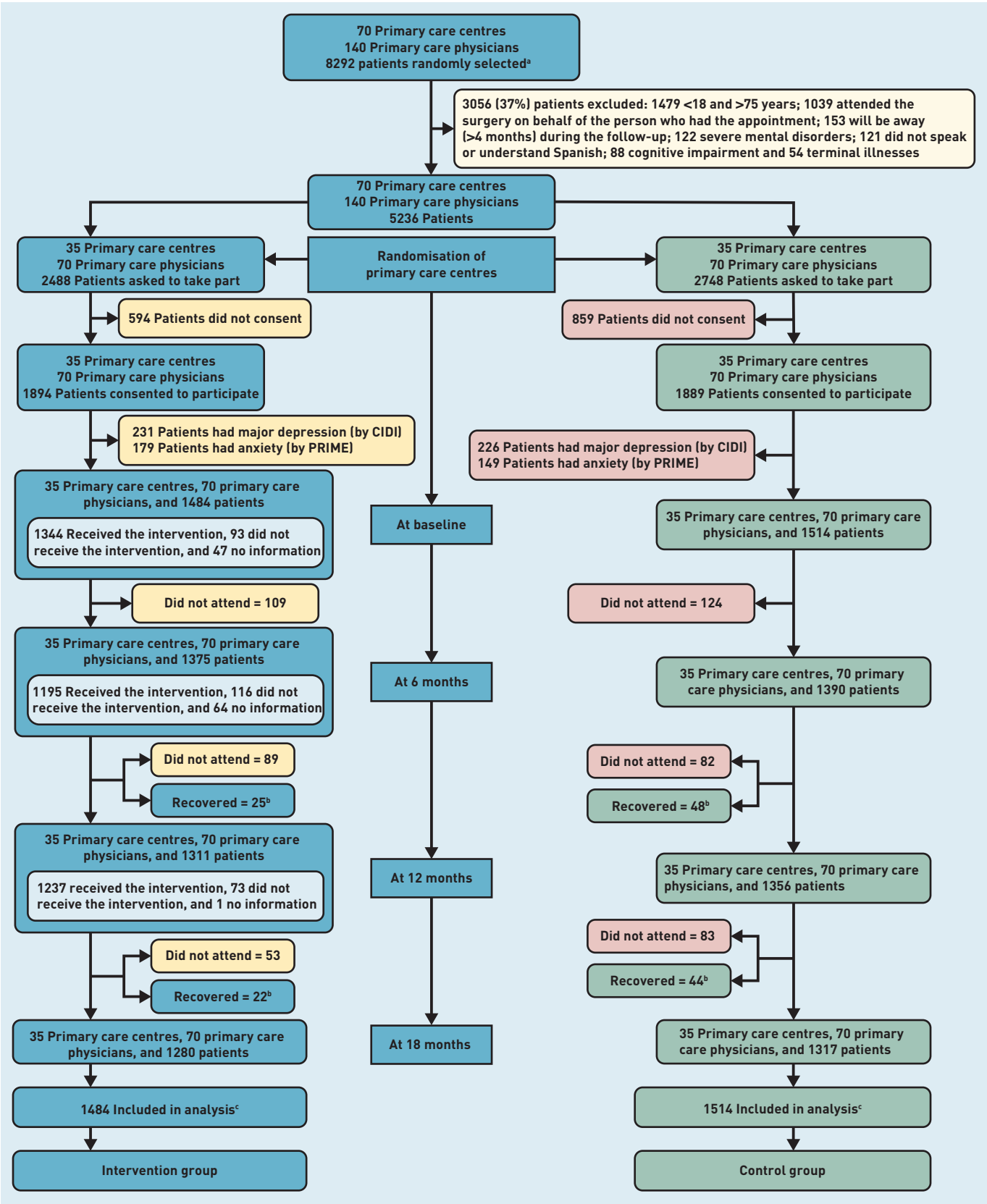


*Figure 1. Study design and operation.*

*[a]Systematic random sampling, from the primary care physicians' appointment lists at random starting points for each day and without replacement. [b]Patients who attended the respective evaluation point, but did not attend any previous point. [c]Analyses conducted using multiple imputation to account for missing outcomes (240 intervention and 250 control patients had missing outcome at 18 months). CIDI = Composite International Diagnostic Interview.*

**Table 1. Baseline characteristics of the primary care centres included in the study**

| Variable | Control group (*n* = 35)[a] | Intervention group (*n* = 35)[a] |
|---|---|---|
| Years in operation, mean (SD) | 18.9 (9.90) | 20.5 (7.29) |
| Enrolled population, mean (SD) | 19 992 (6739) | 20 331 (10 014) |
| Number of primary care physicians, mean (SD) | 11.6 (3.94) | 12.1 (5.83) |
| Number of primary care paediatricians, mean (SD) | 2.5 (1.04) | 2.6 (1.31) |
| Number of primary care nurses, mean (SD) | 12.0 (4.08) | 12.3 (5.33) |
| **Primary care social workers, *n* (%)** | | |
| Half-time or less | 19 (54.3) | 16 (45.7) |
| More than half-time | 16 (45.7) | 19 (54.3) |

[a]*There were no missing values. SD = standard deviation.*

provided information about their age and sex. Compared with participants, these non-participants were slightly more likely to be males (38.4% versus 36.5%) and were of similar age (50.5 versus 50.7 years). A total of 70 practices, 140 GPs, and 3326 non-depressive primary care attendees were recruited at baseline. Of these, 328 patients were removed because in the previous 6 months they had an anxiety syndrome. Therefore, this sub-sample was composed of 2998 primary care patients without depression or anxiety. Baseline characteristics of the participating practices are given in Table 1, and baseline characteristics of the GPs are given in Table 2 (see Supplementary Table S1 for details of baseline characteristics of the patients).

Figure 1 describes the study design and operation. No centre was lost to follow-up. Three GPs in the intervention group could not complete the trial (two because of illness and one because they moved to another practice). Other GPs who were trained in providing the intervention replaced them, with the approval of the steering committee, and provided interventions at 6 and 12 months for the 65 patients who were affected. According to information provided by the GPs, 79.4% (*n* = 1178) of the patients participated in all three GP–patient interviews, 16.5% (*n* = 245) in two interviews, 2.9% (*n* = 43) in one interview, and 1.2% (*n* = 18) in no interviews. Most interviews were carried out face to face, but some were done by telephone (1.3% at baseline [*n* = 19], 7.9% [*n* = 117] at 6 months, and 8.6% [*n* = 128] at 12 months).

At the end of the study (18 months), 1244 (83.8%) patients in the intervention group and 1264 (83.5%) in the control group were evaluated for the cumulative incidence of anxiety. In the intervention group, 1244 (83.8%) participants were evaluated for cumulative incidence of anxiety and 240 (16.2%) participants had missing outcomes in the cumulative incidence of anxiety (and were imputed later). In the control group, 1264 (83.5%) participants were evaluated for cumulative incidence of anxiety and 250 (16.5%) participants had missing outcomes in the cumulative incidence of anxiety (and were also imputed later).

The predictD-intervention was effective at preventing anxiety at 18 months, because 10.4% of patients in the intervention group (95% CI = 8.7% to 12.1%) developed anxiety compared with 13.1% in the control group (95% CI = 11.4% to 14.8%) (absolute difference = –2.67 percentage points; 95% CI = –5.05 to –0.28 percentage points; *P* = 0.029) (Table 3). The intervention was not statistically significant for prevention of anxiety at 6 months or 12 months, although the effectiveness seemed to increase over time (Table 3). The unadjusted analysis was not statistically significant, whereas the analysis adjusted for baseline depression plus additional covariates slightly increased the effectiveness and was statistically significant (absolute difference = –2.78 percentage points; 95% CI = –4.95 to –0.62 percentage points; *P* = 0.012, Table 3).

GPs reported no adverse effects associated with the intervention. Three patients in the intervention group contacted researchers with complaints about their GPs and to request a change of GP.

## DISCUSSION

### Summary

A personalised and novel intervention based on the level of risk and risk profile of depression involving adult patients at low, moderate, and high risk, and implemented by GPs, was effective in reducing the incidence of anxiety syndromes at 18 months. The results of sensitivity analyses were consistent with a modest but robust effect.

### Strengths and limitations

This is the first randomised trial to evaluate the effectiveness of an intervention administered by GPs to prevent depression, which was effective in reducing the onset of anxiety disorders in the adult population. This novel intervention allows for both disorders to be addressed. A large sample of patients were recruited irrespective of their individual risk levels (universal prevention). Furthermore, the trial was delivered by GPs in their practices and was based on usual components of primary care; therefore, it

## Table 2. Baseline characteristics of the family physicians involved in the study

| Variable | Control group (*N* = 70) *n* (%) or mean (SD) | Intervention group (*N* = 70) *n* (%) or mean (SD) |
|---|---|---|
| Sex (male) | 29 (41.4%)[b] | 28 (41.2%)[d] |
| Age (years) | 53.8 (5.97)[d] | 52.1 (7.13)[e] |
| **Size of town where practice located** | [d] | [d] |
| 2500–30 000 inhabitants | 10 (14.7%) | 13 (19.1%) |
| 30 001–200 000 inhabitants | 10 (14.7%) | 11 (16.2%) |
| >200 000 inhabitants | 48 (70.6%) | 44 (64.7%) |
| Primary care physician list size | 1581 (166.02)[f] | 1538 (244.95)[g] |
| Year doctor qualified | 1983 (5.84)[b] | 1984 (7.07)[e] |
| Time working at the health centre (months) | 87.1 (46.20)[b] | 79.8 (45.3)[d] |
| Average time spent per patient <10 minutes[a] | 39 (55.7%)[b] | 41 (60.3%)[d] |
| Relationship with mental health team (good/very good) | 48 (70.6%)[d] | 36 (53.7%)[e] |
| **Satisfaction with support from mental health team** | [c] | [d] |
| Very dissatisfied/dissatisfied | 15 (21.7%) | 14 (20.6%) |
| Neither dissatisfied nor satisfied | 19 (27.5%) | 25 (36.8%) |
| Satisfied/very satisfied | 35 (50.7%) | 29 (42.6%) |
| **Ease and familiarity with handling antidepressants** | [b] | [d] |
| Very uncomfortable/uncomfortable/neither uncomfortable nor comfortable | 10 (14.3%) | 18 (26.5%) |
| Comfortable/very comfortable | 60 (85.7%) | 50 (73.5%) |
| **Relationship with primary care nurses** (good/very good) | 62 (88.6%)[b] | 59 (86.8%)[d] |
| **Active role of primary care nurse with patients with mental health disorders** | [b] | [d] |
| Strongly disagree/disagree | 22 (31.4%) | 30 (44.1%) |
| Neither disagree nor agree | 23 (32.9%) | 20 (29.4%) |
| Agree/strongly agree | 25 (35.7%) | 18 (26.5%) |
| **Relationship with primary care social workers** (good/very good) | 49 (70%)[b] | 45 (66.2%)[d] |
| **Active role of primary care social worker with patients with mental health disorders** | [b] | [d] |
| My team has no primary care social worker | 6 (8.6%) | 8 (11.4%) |
| Strongly disagree/disagree | 16 (22.9%) | 14 (20.0%) |
| Neither disagree nor agree | 23 (32.9%) | 27 (38.6%) |
| Agree/strongly agree | 24 (34.3%) | 18 (25.7%) |
| **Style of professional practice** | | |
| Job satisfaction (range 4–20) | 16.44 (2.32)[b] | 16.09 (2.32)[d] |
| Perception workload (range 4–20) | 14.67 (2.74)[e] | 14.26 (3.65)[d] |
| Biomedical versus psychosocial orientation (range 4–20) | 10.25 (2.96)[d] | 10.38 (3.56)[d] |
| Extraversion (EPQR-A) Low (0 to 4 score) | 35 (51.5%)[d] | 38 (57.6%)[f] |
| Neuroticism (EPQR-A) Low (0 to 4 score) | 67 (95.7%)[b] | 64 (95.5%)[e] |
| Psychoticism (EPQR-A) Low (0 to 4 score) | 68 (98.6%)[c] | 63 (94.0%)[e] |
| Long-term contract (yes) | 65 (92.9%)[b] | 63 (92.6%)[d] |
| Accredited to train residents (yes) | 37 (52.9%)[b] | 37 (54.4%)[d] |
| Training fourth-year resident (yes) | 25 (35.7%)[b] | 24 (35.3%)[d] |
| Training first-year resident (yes) | 17 (24.6%)[c] | 16 (22.9%)[e] |
| Three-to-four year postgraduate training (yes) | 41 (58.6%)[b] | 42 (61.8%)[d] |
| Member of the Communication & Health group (yes) | 6 (8.6%)[b] | 5 (7.4%)[d] |

*[a]Regardless of time per patient assigned on the agenda, what is your average time spent per patient (<10 minutes or ≥10 minutes)? Missing values, number (%): [b]0 (0%); [c]1 (1.4%); [d]2 (2.8%); [e]4 (4.3%); [f]4 (5.7%); [g]5 (7.1%). SD = standard deviation.*

will require little adaptation. This study had several limitations that must be taken into account. The predictD-intervention was performed with the aim of preventing major depression; therefore, this study addresses a secondary objective. The questionnaire used to evaluate the outcome, PRIME-MD, has good reliability and validity indices,[23-24] but it is not possible to rule out classification bias. Moreover, only a syndromic approach was considered as defined by the PRIME-MD (generalised anxiety, panic disorders, and non-specific anxiety).

Although patients were randomly selected by independent research assistants, a potential self-selection bias by patients was possible because there were more refusals to participate in the control group than in

**Table 3. Effectiveness of the study intervention: proportion of patients with anxiety during the study[a]**

| Variable | Intervention group (*n* = 1484, %) (95% CI) | Control group (*n* = 1514, %) (95% CI) | Absolute difference % points (95% CI) | *P*-value |
|---|---|---|---|---|
| **Primary analysis** | | | | |
| Anxiety at 18 months | 10.43 (8.73 to 12.13) | 13.10 (11.4 to 14.79) | −2.67 (−5.05 to −0.28) | 0.029 |
| **Secondary analysis** | | | | |
| Anxiety at 6 months | 4.55 (3.16 to 5.95) | 5.18 (4.04 to 6.32) | −0.63 (−2.43 to 1.17) | 0.492 |
| Anxiety at 12 months | 7.99 (6.43 to 9.55) | 9.56 (8.14 to 10.98) | −1.57 (−3.67 to 0.54) | 0.145 |
| **Sensitivity analysis** | | | | |
| Anxiety at 18 months, unadjusted | 10.69 (8.91 to 12.46) | 12.83 (10.88 to 14.79) | −2.14 (−4.78 to 0.50) | 0.112 |
| Anxiety at 18 months, adjusted for all unbalanced variables[b] | 10.36 (8.81 to 11.91) | 13.14 (11.62 to 14.67) | −2.78 (−4.95 to −0.62) | 0.012 |

*[a]Displays standardised probabilities or predicted margins estimated using generalised estimating equations including an exchangeable correlation structure and robust standard errors for clustering on centre and adjusted for baseline probability of depression. [b]Adjusted for baseline probability of depression, the other unbalanced baseline variables not included in the predictD-Spain risk algorithm (employment status, owner/occupier of an accommodation, perception of safety inside/outside the home, and experiences of discrimination), GPs' familiarity and ease in their relationships with mental health teams, social workers, nurses, and use of antidepressants, and city. CI = confidence interval.*


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## Ethical approval

The predictD-CCRT Study complies with the Declaration of Helsinki. This trial was approved by the following ethics committees in each participating city: Ethics Committee on Human Research of the University of Granada, Ethics and Research Committee of Primary Health District of Málaga, Ethics Committee on Clinical Research of Sant Joan de Déu Foundation (Barcelona) (PIC CEIC-62-09), Ethics Committee of Clinical Research of Aragon (CP06/05/2009), Ethics Committee for Health Research of the Jaén Hospital, Ethics Committee for Clinical Research of Euskadi (03/2009), and Ethics Committee for Clinical Research of the Rio Hortega Hospital of Valladolid (04/2009). Trial registration: ClinicalTrials.gov identifier: NCT01151982.

the intervention group. This, along with the cluster randomisation, could explain the relative imbalance at the patient level.[30,31] Patients in the control group were more satisfied with home life and felt safer than patients in the intervention group, which might have made them generally less likely to develop an anxiety disorder. Similarly, control GPs were more comfortable in their relationships with mental health teams, social workers, nurses, and use of antidepressants than were intervention GPs. When all these variables were adjusted for in the sensitivity analysis, the effectiveness in preventing anxiety was slightly increased (Table 3). Finally, the sample possibly underrepresented patients who are treated infrequently;[32] however, those who are seen frequently are more likely to develop anxiety disorders,[33] and therefore have the most need for preventive strategies.

### Comparison with existing literature

An intervention to prevent major depression that also reduces the incidence of anxiety syndromes could be explained by the fact that depression and anxiety share most of the same risk factors,[12,13] and it is also possible that both are expressions of a latent pathological process.[34] Many interventions have been developed for the prevention of both anxiety and depression disorders, showing successful results in both cases.[15,16] Transdiagnostic interventions seem to be a promising approach, and those aimed at preventing both depression and anxiety are increasing.[35,36] The clinical practice guides consider the use of antidepressants as one of the treatments of choice for generalised anxiety disorders and panic disorder.[37,38]

It is possible that the preventive effect on depression of the predictD-intervention generated the reduction in anxiety through the modification of a set of shared risk between anxiety and depression.[39] Moreover, the mediators of psychological and psychoeducational interventions for the prevention of depression and anxiety are quite similar, being the change in cognitions as the main mediator of both conditions.[40] Another non-exclusive hypothesis might be that the predictD-intervention first reduced the incidence of anxiety and then the incidence of depression or vice versa. Evidence indicates that anxiety disorders temporally precede depression in most comorbid cases[41] and that treatment for an anxiety disorder also produces declines in mood disorders.[42] On the other hand, it might be that the predictD-intervention improves people's mental health in general, leading to prevention of anxiety and depression at once.

The reduction in anxiety syndromes was about the same size as reductions reported in other studies that have evaluated psychological interventions to reduce separately the incidence of anxiety and depression.[7,43,44] However, several studies found greater reductions in the incidence of panic disorder.[45,46]

The reduction of the incidence of anxiety in the current study seemed to increase over time, which might be due to a dose–response effect of the intervention or simply a need for time and the accumulation of intervention visits to create the changes needed to prevent anxiety. A similar finding was observed for the reduction of the incidence of depression through the predictD-intervention,[19] but this was not so in other interventions for the primary prevention of anxiety.[7,47,48]

Most studies into the prevention of anxiety and depression examined interventions with a cognitive behaviour orientation, which have been administered by psychologists.[7,43,44] In the current study, the predictD-intervention is based on each patient's individual risk for major depression, identifies specific risk factors for depression in each patient that are amenable to change, and helps the patient use this information to improve knowledge and alter behaviour. Furthermore, it is delivered by GPs in their practices.

## Implications for research and practice

A personalised intervention based on the level and risk profile of depression implemented by GPs provided a modest but statistically significant reduction in the incidence of anxiety. Although the effect size was a small decrease in anxiety incidence in the predictD-intervention group in comparison with the usual-care group), these relative numbers could be clinically relevant in absolute terms. From the perspective of public health, small effects on prevention could have a high impact, avoiding anxiety and depression, improving quality of life, and reducing costs, if the interventions are cost-effective and scalable to a large number of people, which is possible in a primary care setting. From this perspective, and bearing in mind the findings, healthcare systems could be encouraged to implement and disseminate prevention programmes for both anxiety and depression disorders rather than for each disorder alone.[49] The fact that the predictD-intervention was cost-effective for the prevention of depression when delivered by GPs in their practices[20] would facilitate its implementation. However, it remains to be clarified whether universal prevention of anxiety and depression in primary care is more cost-effective and acceptable for GPs and patients than selective prevention in patients who are high-risk.

In general, patients were pleased to be informed about their risk for depression,[50] and the GPs had a positive experience with the predictD-intervention, as it was easily embedded into their practice.[51] They perceived it useful as a biopsychosocial approach for improving the emotional health of patients and their relationship with them, as well as their own satisfaction as a GP. However, they also detected some barriers such as lack of time, and the need for specific training to effectively communicate the risk of developing depression.[51] For the future implementation of the predictD-intervention, GPs suggested intervention based on level of risk. From their point of view, having to carry out an intervention in all patients regardless of their level of risk (universal prevention) is an unrealistic workload.[51]

It is not known how important patient initiative (dealing with their risk factors, overcoming difficulties, as well as starting healthy behaviours) and empowerment were in the predictD-intervention, nor which or how many of the components of the intervention were involved in each case. Studies to define the active ingredients of the intervention are therefore also necessary. The predictD-intervention seems promising, but further studies to confirm and even improve these results are needed.


### Provenance

Freely submitted; externally peer reviewed.

### Competing interests

The authors have declared no competing interests.

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### Data sharing

Individual participant data that underlie the results reported in this article will be made available on request after de-identification. The proposed use of the data must be approved by an independent review committee.



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