



ELSEVIER

Contents lists available at ScienceDirect

European Psychiatry

journal homepage: <http://www.europsy-journal.com>

Original article

## Pharmaceutical industry interactions of psychiatric trainees from 20 European countries



F. Riese<sup>a,\*</sup>, S. Guloksuz<sup>b,c</sup>, C. Roventa<sup>d</sup>, J.D. Fair<sup>e</sup>, H. Haravuori<sup>f</sup>, T. Rolko<sup>g</sup>, D. Flynn<sup>h</sup>, D. Giacco<sup>i</sup>, V. Banjac<sup>j</sup>, N. Jovanovic<sup>k</sup>, N. Bayat<sup>l</sup>, C. Palumbo<sup>m</sup>, M. Rusaka<sup>n</sup>, O. Kilic<sup>o</sup>, J. Augénaitė<sup>p</sup>, A. Nawka<sup>q</sup>, M. Zenger<sup>r</sup>, I. Kekin<sup>k</sup>, P. Wuyts<sup>s</sup>, E. Barrett<sup>t</sup>, N. Bausch-Becker<sup>a</sup>, J. Mikaliūnas<sup>p</sup>, E. del Valle<sup>u</sup>, K. Feffer<sup>v</sup>, G.A. Lomax<sup>w</sup>, J.G. Marques<sup>x</sup>, S. Jauhar<sup>y</sup>

<sup>a</sup> Psychiatric University Hospital Zurich, Division of Psychiatry Research and Psychogeriatric Medicine, Lenggstr. 31, 8032 Zurich, Switzerland

<sup>b</sup> Department of Psychiatry and Psychology, Maastricht University Medical Centre, EURON, Maastricht, The Netherlands

<sup>c</sup> Department of Psychiatry, Yale University, New Haven, CT, USA

<sup>d</sup> University Psychiatry Hospital Pr. Dr. Al. Obregia, Bucharest, Romania

<sup>e</sup> Kershaw Unit, Gartnavel Royal Hospital, Glasgow, United Kingdom

<sup>f</sup> Hospital District of Helsinki and Uusimaa, Kellokoski Hospital and National Institute for Health and Welfare, Helsinki, Finland

<sup>g</sup> Psychiatric Clinic, Tartu University Hospital, Tartu, Estonia

<sup>h</sup> Department of Psychiatry, St. Lukes Hospital, Kilkenny, Ireland

<sup>i</sup> Unit for Social and Community Psychiatry, Barts and the London School of Medicine and Dentistry, Queen Mary University of London, London, United Kingdom

<sup>j</sup> Clinic for Psychiatry, University Clinical Center Banjaluka, Banjaluka, Bosnia-Herzegovina

<sup>k</sup> Department of Psychiatry, University Hospital Center Zagreb, Zagreb, Croatia

<sup>l</sup> Arkin Psychiatric Institution, Amsterdam, The Netherlands

<sup>m</sup> Department of Neuroscience and Sense Organ, University of Bari, Bari, Italy

<sup>n</sup> Riga Stradins University, Riga, Latvia

<sup>o</sup> Department of Psychiatry, Cerrahpasa Medical Faculty, Istanbul University, Istanbul, Turkey

<sup>p</sup> Vilnius University Psychiatric Clinic, Vilnius, Lithuania

<sup>q</sup> Department of Psychiatry, First Faculty of Medicine, Charles University in Prague, Prague, Czech Republic

<sup>r</sup> Central Ostrobothnia Hospital District, Kokkola Central Hospital, Kokkola, Finland

<sup>s</sup> UPC KU Leuven, Leuven, Belgium

<sup>t</sup> Our Lady's Hospital for Children, Crumlin, Dublin, Ireland

<sup>u</sup> Centre Hospitalier Universitaire de La Tronche, 38700 Grenoble, France

<sup>v</sup> Shalvata Mental Health Center, Hod Hashron, Israel

<sup>w</sup> South West London and St George's Mental Health Trust, London, United Kingdom

<sup>x</sup> Centro Hospitalar Psiquiátrico de Lisboa, Lisbon, Portugal

<sup>y</sup> Department of Psychosis Studies, Institute of Psychiatry, King's College, London, United Kingdom

### ARTICLE INFO

#### Article history:

Received 17 June 2014

Received in revised form 15 September 2014

Accepted 21 September 2014

Available online 20 November 2014

#### Keywords:

Psychiatric training

Pharmaceutical industry

Conflict of interest

Industry interactions

European Federation of Psychiatric

Trainees

EFPT

### ABSTRACT

**Background:** Interactions between the pharmaceutical industry (PI) and psychiatrists have been under scrutiny recently, though there is little empirical evidence on the nature of the relationship and its intensity at psychiatry trainee level. We therefore studied the level of PI interactions and the underlying beliefs and attitudes in a large sample of European psychiatric trainees.

**Methods:** One thousand four hundred and forty-four psychiatric trainees in 20 European countries were assessed cross-sectionally, with a 62-item questionnaire.

**Results:** The total number of PI interactions in the preceding two months varied between countries, with least interactions in The Netherlands (M (Mean) = 0.92, SD = 1.44, range = 0–12) and most in Portugal (M = 19.06, SD = 17.44, range = 0–100). Trainees were more likely to believe that PI interactions have no impact on their own prescribing behaviour than that of other physicians (M = 3.30, SD = 1.26 vs. M = 2.39, SD = 1.06 on a 5-point Likert scale: 1 “completely disagree” to 5 “completely agree”). Assigning an educational role to the pharmaceutical industry was associated with more interactions and higher gift value (IRR (incidence rate ratio) = 1.21, 95%CI = 1.12–1.30 and OR = 1.18, 95%CI = 1.02–1.37).

\* Corresponding author.

E-mail address: [florian.riese@bli.uzh.ch](mailto:florian.riese@bli.uzh.ch) (F. Riese).

**Conclusions:** There are frequent interactions between European psychiatric trainees and the PI, with significant variation between countries. We identified several factors affecting this interaction, including attribution of an educational role to the PI. Creating alternative educational opportunities and specific training dedicated to PI interactions may therefore help to reduce the impact of the PI on psychiatric training.

© 2014 Elsevier Masson SAS. All rights reserved.

## 1. Introduction

Interactions between health care professionals and the pharmaceutical industry (PI) have been identified as a source of conflict of interest for many years [19,31,2] and have received considerable attention through recent publications aimed at the general public [7,6]. In psychiatry, awareness was heightened by the disclosure of financial links of several prominent US psychiatrists with the PI [30,10,15]. While interactions with the PI can have financial benefits for the individual psychiatrist (e.g. support for research or educational activities), they may result in altered prescribing practices or increased tendency to prescribing in general [19,31,2,26] and undermine the trust of patients in physicians [30,10,15,11]. Consequently, national and international medical as well as psychiatric associations have published guidance on these interactions [3,14]. Already at the level of medical students, there is substantial exposure to pharmaceutical marketing [4] and a recent French study suggests that medical students fail to recognize typical PI interactions (such as sponsored lunches or participation in a sponsored training) as conflict of interest situations [9]. Likewise, psychiatric residents, as current and future prescribers of psychotropic medication, have a high number of interactions with pharmaceutical representatives [13,29,21,5]. However, with the exception of one Turkish study [12], no data is available on PI interactions of European psychiatric trainees. Furthermore, there are no studies that allow for international comparison, and no studies on industry interactions with trainees in child and adolescent psychiatry (CAP). Since access to high quality, unbiased medical education is of paramount importance for postgraduate medical training, the objective of the European Federation of Psychiatric Trainees – psychiatric residents industry relationship survey (EFPT–PRIRS) was to investigate the extent of interactions between the PI and European trainees in psychiatry and CAP and how their attitudes and beliefs influence these interactions.

## 2. Methods

### 2.1. Study design

The EFPT–PRIRS study is an international cross-sectional survey of trainees in psychiatry and child and adolescent psychiatry in 20 European countries (World Health Organization definition of Europe). The study builds on the network generated by the European Federation of Psychiatric Trainees (EFPT), the independent umbrella organization of the national trainee associations in psychiatry and CAP in Europe [24,16,18]. European countries not represented in the survey did either not dispose of a national psychiatric trainee organization at the time of the study (e.g. Norway) or were not able to identify a national coordinator who would take over local responsibility for the study (e.g. Sweden). The EFPT–PRIRS survey questionnaire is a 62-items self-report questionnaire in which interactions with pharmaceutical industry were defined as direct face-to-face contact and personal forms of communication, for example phone calls, emails and lectures. Non-directed forms of communication, e.g. reading an advertisement in a journal were not considered to be interactions. The questionnaire

is based on a modified version of a validated questionnaire originally developed by McKinney and colleagues [20,23]. Minor adaptations were made to the original questions in order to increase fit to the study population. Additional questions were included so that the final questionnaire covered the following aspects: demographics, beliefs on PI interactions, number and type of PI interactions, estimated value of gifts received, alternative funding source for educational conferences, role of senior psychiatrists, knowledge of and perceived adherence to PI interaction guidelines. The survey was piloted among the members of the EFPT–PRIRS study group.

### 2.2. Data collection

The questionnaire was administered anonymously, in paper-format by one or two national co-ordinators per country. In the UK, the survey was administered online since a national database of trainee e-mail addresses was available. For the UK, due to its specific training system, trainees in psychiatric specialties such as consultation and liaison psychiatry were counted as trainees in adult psychiatry. The questionnaire was distributed in English language in all countries, since psychiatric trainees were universally deemed by national coordinators to be in sufficiently good command of English to reliably answer the questions. The participating countries were Albania, Belgium, Bosnia-Herzegovina, Croatia, Czech Republic, Estonia, Finland, France, Germany, Ireland, Israel, Italy, Latvia, Lithuania, The Netherlands, Portugal, Romania, Switzerland, Turkey and the UK. Spain dropped out from participation before data collection. Per country, a number of 50 completed surveys at a response rate of  $\geq 60\%$  were set as recruitment goal, if the total number of trainees in that country allowed it (e.g. in Albania with a total population of  $n = 15$  trainees only 15 responses could be obtained). In most countries, ad hoc samples on national congresses or educational events were chosen in order to reach a sufficient number of responses. Data collection was performed in the years 2010–2012. Prior to the start, approval for the study was sought from local ethics boards under the responsibility of the national co-ordinators but was not required in any of the participating countries. Returning the anonymous questionnaire was considered to be indicative of informed consent. These considerations are in keeping with the ethical principles set out in the declaration of Helsinki. After collection of paper surveys, data was entered into the central study database by the national co-ordinators via the online survey tool SurveyMonkey (SurveyMonkey, Palo Alto, CA, USA).

### 2.3. Statistical analysis

Data was analysed centrally using STATA version 12.0 (STATA Corporation, College Station, TX, USA). Simple frequencies were used for descriptive analyses. Principal-component factor analyses were performed in order to reduce data for further analyses and to identify underlying constructs addressed in each of the scales assessing attitudes toward PI (10 items) and perceived appropriateness of gift acceptance from PI (10 items). Only factors with eigenvalues greater than 1 were included. The factor loadings exceeding 0.4 were treated as significant. Varimax rotation was

performed to improve the interpretability of the factors. Since perceived appropriateness of a gift approval was expected to be positively associated with one another, promax rotation was used to identify the factor patterns of perceived appropriateness of gift approval from PI. Regression factor scores were then based on the factor loadings of the rotation.

Kruskal Wallis test was used to test whether the number of interactions differs among countries, and if so, Mann-Whitney tests were used to compare each country against the rest of the sample ( $n = 20$  post hoc tests, Bonferroni corrected  $\alpha = 0.0025$ ). Since the number of interactions with PI representatives in the last two months is a count measure and most closely approximated a negative binomial distribution rather than a Poisson distribution, multilevel negative binomial regression model using XTNBREG command in STATA was applied to examine the association between the number of interactions with PI representatives in the last two months on the one hand and gender, completed years of training, specialty, responsibility for the prescribing of psychotropic medication, income satisfaction, derived factor scores after factor analyses, degree of aid from senior for interaction with PI representative, available source for conference admission from employer/institution, PI and own personal money on the other hand. Ordered logistic regression model using the GLLAMM command [22,32] in STATA was used to examine the association between the six ordered categories for total value of gifts received from PI during the past year (ranging from  $< 20$  € to  $> 1000$  €) and the same variables that were used to examine the correlates of number of interactions with PI representatives in the last two months. As observations were clustered within countries (not a simple random sample), country was treated as a random effect with observation nested within the country in both regression models. This procedure results in standard errors that are adjusted for clustering within countries. Effect sizes were reported as incidence rate ratios (IRR) with their 95% confidence interval

(95%CI) for the number of interactions and odds ratios (OR) for the gift values. Two-sided statistical significance was set at  $P < 0.05$ .

### 3. Results

#### 3.1. Sampling and sample characteristics

One thousand four hundred and forty-four responses were collected from trainees in 20 countries. Between countries, the number of participants varied between 13 (Latvia) and 307 (United Kingdom; see Table 1 for details of sampling). Almost ninety percent of the sample train in adult psychiatry ( $n = 1268$ , 88.12%). Female trainees were more frequent than male (60% vs. 40% of the sample). The mean age of trainees was 31.5 years (SD: 5.35 years) and the mean duration of training 2.92 years (SD: 2.03 years). More than 87% of our sample prescribed psychotropic medication either independently or under supervision. Satisfaction with income varied greatly between trainees and countries. Detailed general and professional characteristics of the sample are presented in Table 2.

#### 3.2. Interaction frequencies

Of the sample, 73.3% had interacted with a PI representative at least once during the past two months ( $M = 4.88$ ,  $SD = 14.32$ , range = 0–240). The total number of interactions during the prior two months varied between countries ( $P = 0.0001$ ), with the Netherlands ( $P < 0.0001$ ), the United Kingdom ( $P < 0.0001$ ), Croatia ( $P = 0.0014$ ), Lithuania ( $P = 0.0020$ ), at the low end of the spectrum and Portugal ( $P < 0.0001$ ), Romania ( $P < 0.0001$ ), Finland ( $P < 0.0001$ ), and Turkey ( $P < 0.0001$ ) at the high end of the spectrum. The interaction frequencies for all countries are listed in Table 3.

**Table 1**  
Sampling.

	Distributed questionnaires	Valid responses <sup>a</sup> (% of total)	Response rate (%)	Total trainees in country <sup>b</sup>	Sampling frame
Albania	15	15 (1.04)	100	15	All trainees in the country
Belgium	160	35 (2.42)	22	160 <sup>d</sup>	All trainees in Flanders (Flemish speaking part of Belgium)
Bosnia & Herzegovina	40	25 (1.73)	63	45	All trainees in the country
Croatia	80	50 (3.46)	63	103	All trainees in the country
Czech Republic	90	57 (3.95)	63	150	All trainees taking part in national trainee network organization
Estonia	24	21 (1.45)	88	39	All trainees in the country
Finland	110	65 (4.50)	59	280	All trainee attendants of a national conference
France	56	50 (3.46)	89	1400	20 trainee representatives from major French cities were asked to pass on to 1–2 colleagues in each city
Germany	70	51 (3.53)	73	6500	All participants of two centralized preparatory for licensing exam
Ireland	91	55 (3.81)	60	287	All trainees registered with current postal address with the College of Psychiatrists of Ireland
Israel	68	50 (3.46)	74	150	All trainee attendants of national psychiatric congress
Italy	51	51 (3.53)	100	1457	All trainees from two major teaching institutions
Latvia	13	13 (0.90)	100	23	All trainees participating in a nationwide teaching event
Lithuania	65	62 (4.29)	95	95	All trainees from the two major teaching institutions
Netherlands	156	122 (8.45)	78	717	All participants in one Amsterdam region trainee teaching course; all trainees in three national conferences
Portugal	50	50 (3.46)	100	150	50 trainees at national congress
Romania	350	227 (15.72)	65	730	All trainees in university teaching centers
Switzerland	73	57 (3.95)	78	1600	All trainees participating in centralized education course for trainees in Zurich/NorthEast-Switzerland region
United Kingdom	3176 <sup>c</sup>	307 (21.26)	10	3176	All trainees registered with current email address with the Royal College of Psychiatrists
Turkey	100	81 (5.61)	81	700	All trainee attendants of a national conference

<sup>a</sup> Questionnaires were considered valid responses if the demographic section was completed and the participant declared to be trainee in psychiatry and was in training in the country where the questionnaire was delivered.

<sup>b</sup> According to national coordinators (in some countries exact figures are not available since no central registry is kept); if applicable adult psychiatry and CAP trainees where totalled.

<sup>c</sup> Distribution via email.

<sup>d</sup> Flemish speaking part only.

**Table 2**  
Sample characteristics.

	n (%)
<i>Personal</i>	
Gender	
Female	867 (60.21)
Male	573 (39.79)
Age in years <sup>a</sup>	31.50 (5.35)
<i>Professional</i>	
Specialty	
Adult psychiatry	1268 (88.12)
Child and adolescent psychiatry	171 (11.88)
Completed years in training <sup>a</sup>	2.92 (2.03)
Responsibility for the prescribing of psychotropic medication	
Independent prescribing responsibility	723 (50.84)
Prescribing under supervision	523 (36.78)
No prescribing responsibility	176 (12.38)
Income satisfaction	
Very dissatisfied	165 (11.55)
Dissatisfied	357 (25.00)
Neutral	357 (25.00)
Satisfied	466 (32.63)
Very satisfied	83 (5.82)

<sup>a</sup> Reported as mean (SD).

### 3.3. Trainee attitudes towards interactions with the pharmaceutical industry

Psychiatric trainees' attitudes toward PI are reported in [Table 4](#). Only a minority of the trainees (16.2%) agreed that interactions with PI representatives have no impact on physicians' prescribing behaviours. In contrast, 46.4% of respondents declared that interactions with PI representatives and 64.4% of respondents that gifts from PI have no impact on their own prescribing behaviour. The three factors structure according to the inspection of eigenvalues greater than unity and the scree plot was considered as the best solution (MSA = 0.751; Bartlett's test of sphericity = 2,778,645,  $P < 0.0001$ ) and explained 57.9% of the variance. The three factors were named "prescribing", "education" and

**Table 3**  
Total number of industry interactions in the last two months (per country).

Country	Total number of interactions <sup>a</sup> (last two months)			
	Mean	Median	SD	Range
Albania	1.67	0	2.96	0–10
Belgium	3.80	4	2.84	0–10
Bosnia & Herzegovina	4.04	4	2.35	1–10
Croatia	4.22	4	3.16	0–15
Czech Republic	2.67	2	2.48	0–10
Estonia	3.62	4	2.60	0–10
Finland	5.26	5	3.42	0–15
France	3.52	3	2.35	0–12
Germany	2.02	1	2.15	0–8
Ireland	3.51	2	3.94	0–20
Israel	3.16	2.5	2.98	0–10
Italy	4.37	3	4.17	1–20
Latvia	1.15	1	1.14	0–3
Lithuania	1.81	1	2.27	0–10
Netherlands	0.82	0	1.44	0–12
Portugal	19.06	20	17.44	0–100
Romania	8.05	4	25.35	0–240
Switzerland	1.52	1	1.34	0–5
United Kingdom	1.35	0	2.14	0–16
Turkey	18.91	10	32.82	0–200
Total Sample	4.88	2	14.32	0–240

<sup>a</sup> Interactions with pharmaceutical industry were defined as direct face-to-face contact and personal forms of communication, for example phone calls, email and lectures. Non-directed forms of communication, e.g. reading an advertisement in a journal were not considered to be interactions.

"marketing". The Varimax rotated solution of the factor analysis is presented in [Table 4](#). Psychiatric trainees' perceived appropriateness of receiving gifts from PI is reported in [Supplementary data, Table S1](#). The majority of the trainees considered most of the gifts as appropriate to receive in varying degrees, except all-expense paid trips to attend an educational conference, airline tickets to vacation spots, and social dinners at a restaurant. The two factors structure according to the inspection of eigenvalues greater than unity and the scree plot was considered as the best solution (MSA = 0.900; Bartlett's test of sphericity = 1,1196,695,

**Table 4**  
Attitudes towards interactions with the pharmaceutical industry.

Items	Score mean (SD)	Completely agree/somewhat agree n (%)	Factor 1 ("Prescribing")	Factor 2 ("Education")	Factor 3 ("Marketing")
My interactions with pharmaceutical representatives have no impact on my prescribing behavior	3.30 (1.26)	650 (46.42)	0.8664	-0.0564	-0.0623
Accepting promotional gifts from pharmaceutical representatives has no impact on my prescribing behavior	3.74 (1.29)	901 (64.36)	0.7937	0.2464	-0.0526
Interactions with pharmaceutical representatives have no impact on physicians' prescribing behavior	2.39 (1.06)	228 (16.24)	0.6754	0.1811	0.1074
I would have the same amount of contact with pharmaceutical representatives whether or not gifts, including food, were given to me	3.44 (1.30)	739 (52.97)	0.5178	0.2790	-0.3048
Pharmaceutical representatives perform an important teaching function at the institution where I work most of the time	2.33 (1.13)	244 (17.39)	0.0343	0.7505	-0.1101
Pharmaceutical representatives provide useful and accurate information about drugs	2.95 (0.99)	417 (29.70)	0.2029	0.7402	-0.1159
Pharmaceutical representatives should support conferences and speeches in the institution where I work most of the time	3.17 (1.25)	612 (43.78)	0.2759	0.7063	0.0458
Pharmaceutical representatives use marketing techniques in their interactions with residents/psychiatric trainees <sup>a</sup>	3.87 (1.14)	985 (70.20)	0.0453	-0.1337	0.7220
A senior psychiatrist should be present at all presentations by pharmaceutical representatives <sup>a</sup>	3.43 (1.35)	739 (52.71)	-0.1251	-0.0697	0.6945
Pharmaceutical representatives should be banned from giving presentations in the institution where I work most of the time <sup>a</sup>	2.35 (1.24)	249 (17.78)	0.0105	0.5118	0.5816

Factor loadings of the items assessing attitudes toward pharmaceutical industry. Bold print denominates items pertaining to factors. Items were scored on a 5-point Likert scale ranging from 1 "completely disagree" to 5 "completely agree".

<sup>a</sup> These items were reverse coded in factor analysis. After this reverse coding, higher scores indicate greater tendency to perceive pharmaceutical industry favourable for all items.

**Table 5**

Number and type of gifts received during the past two months.

	0 n (%)	1–2 n (%)	3–5 n (%)	> 5 n (%)
Meal while attending an educational lecture, seminar, or conference	605 (43.59)	617 (44.45)	131 (9.44)	35 (2.52)
Catered meal while attending an administrative meeting	1.010 (72.92)	307 (22.17)	54 (3.90)	14 (1.01)
Drug samples for patient use	1.036 (74.64)	229 (16.50)	73 (5.26)	50 (3.60)
Drug samples for personal use	1.313 (94.66)	55 (3.97)	12 (0.87)	7 (0.50)
Local recreational or cultural event	1.255 (90.74)	105 (7.59)	16 (1.16)	7 (0.51)
A pocket medical/psychiatric book	1.145 (82.55)	203 (14.64)	33 (2.38)	6 (0.43)
A medical/psychiatric textbook	1.184 (85.61)	154 (11.14)	39 (2.82)	6 (0.43)
Social meal at a restaurant	1.134 (82.00)	218 (15.76)	24 (1.74)	7 (0.51)
Office supplies such as pens, coffee mugs, notepads, clocks, etc.	548 (39.48)	502 (36.17)	230 (16.57)	108 (7.78)
Computer software related to patient care	1.307 (94.23)	69 (4.97)	7 (0.50)	4 (0.29)
Free or subsidized admission to conferences <sup>a</sup>	854 (61.35)	420 (30.17)	85 (6.11)	33 (2.37)
Costs of travel, meals, lodging or other personal expenses for attending conferences <sup>a</sup>	987 (71.21)	322 (23.23)	56 (4.04)	21 (1.52)
Honoraria for speaking <sup>a</sup>	1.338 (97.10)	33 (2.39)	6 (0.44)	1 (0.07)
Payment in excess of costs for enrolling patients in industry sponsored trials <sup>a</sup>	1.340 (97.38)	33 (2.40)	3 (0.22)	0

<sup>a</sup> Number and types of gifts received during past twelve months.

$P < 0.0001$ ) and explained 71.1% of the variance. The two factors were named “work-related gifts” and “non-work related gifts”. The promax rotated solution of the factor analysis was presented in [Supplementary data, Table S1](#).

### 3.4. Gift acceptance and trainee behaviour during interactions

The total value of received gifts and benefits (including food) during the last year, was stated to be below 20 € by 49.7% of respondents. However, 7.9% of respondents declared to have received gifts with a value of more than 500 €. The estimated numbers of gifts received from PI are presented in [Table 5](#). Of the sample, 57.1% of the trainees had attended at least one presentation of PI during the past two months. More than half (59.1%) of the trainees, who attended a presentation, had chosen to listen to the presentation quietly, whereas 6.0% worked on other things during the presentation, 14.7% asked questions to elicit the reliability of the information, 19.5% asked questions about the use of the drug. Trainees responded to the Likert-type scored items (ranging from 1 = very difficult to 5 = very easy) that the easiest obtained source to go to educational conferences was from own

personal money ( $M = 2.58$ ,  $SD = 1.23$ ) followed by from PI ( $M = 2.42$ ,  $SD = 1.12$ ), and from the institution ( $M = 2.29$ ,  $SD = 1.30$ ). Trainees responded to the Likert-type scored item (ranging from 1 = never to 4 = very often) that senior psychiatrists mostly aid them in their interaction with PI (e.g. by inviting trainees to industry sponsored events or passing on industry sponsored information material) ( $M = 3.02$ ,  $SD = 0.80$ ).

### 3.5. Correlates of interaction with the pharmaceutical industry

[Table 6](#) shows the association between the number of interactions with PI representatives in the last two months, the total value of gifts received from PI during the past year and several possibly explanatory variables. Females and CAP trainees were both less likely to interact with PI and to receive valuable gifts from PI. Increased income satisfaction was associated with increased number of interactions with PI. Factor 2 (“education”) was associated with both the number of interactions with PI and the total value of gifts received from PI. Factor 3 (“marketing”) was negatively correlated with the total value of gifts received from PI. Availability of funds for conference admission from PI and aid from

**Table 6**

Correlates of interaction with the pharmaceutical industry.

	Total number of interaction <sup>a</sup>		Total gift value <sup>b</sup>	
	IRR (95% CI)	P	OR (95% CI)	P
<b>Gender</b>				
Male	1 [Reference]		1 [Reference]	
Female	0.87 (0.77, 0.98)	0.027	0.72 (0.56, 0.93)	0.011
Completed years in training	0.98 (0.94, 1.01)	0.217	1.04 (0.97, 1.11)	0.270
<b>Specialty</b>				
Adult psychiatry	1 [Reference]		1 [Reference]	
Child & adolescent psychiatry	0.82 (0.67, 0.99)	0.049	0.59 (0.40, 0.86)	0.006
<b>Responsibility for the prescribing of psychotropic medication</b>				
Independent prescribing responsibility	1 [Reference]		1 [Reference]	
Prescribing under supervision	1.05 (0.90, 1.22)	0.541	0.77 (0.58–1.04)	0.091
No prescribing responsibility	0.87 (0.70, 1.08)	0.203	0.54 (0.35–0.83)	0.005
<b>Income satisfaction</b>	1.10 (1.04, 1.17)	0.002	0.99 (0.88, 1.12)	0.958
Factor 1 (“Prescribing”)	1.01 (0.95, 1.08)	0.761	0.99 (0.86, 1.13)	0.872
Factor 2 (“Education”)	1.21 (1.12, 1.30)	<0.001	1.18 (1.02, 1.37)	0.022
Factor 3 (“Marketing”)	1.02 (0.95, 1.09)	0.521	0.84 (0.73, 0.96)	0.014
Factor 1 (“work-related gifts”)	1.04 (0.95, 1.13)	0.345	1.56 (1.31, 1.87)	<0.001
Factor 2 (“non-work related gifts”)	0.96 (0.90, 1.03)	0.264	0.95 (0.83, 1.10)	0.521
Source for conference admission from employer/institution	0.98 (0.92, 1.04)	0.457	0.88 (0.78, 0.99)	0.034
Source for conference admission from pharmaceutical industry	1.15 (1.08, 1.22)	<0.001	1.78 (1.56, 2.03)	<0.001
Source for conference admission from own personal money	0.97 (0.92, 1.03)	0.355	0.97 (0.86, 1.09)	0.645
Aid from senior psychiatrist for interaction with pharmaceutical representatives	1.11 (1.03, 1.19)	0.004	1.34 (1.15, 1.55)	<0.001

IRR: incidence rate ratio, OR: odds ratio.

<sup>a</sup> Total number of interactions with pharmaceutical industry representatives in the last two months.<sup>b</sup> Total value of gifts received from pharmaceutical industry during the past year.

senior psychiatrists for interaction with PI representatives were positively associated with both the number of interactions with PI and total value of gifts received from PI. In contrast, availability of funds for conference admission from the employer/institution was negatively associated with total value of gifts received from PI. Factor 1 (“work-related gifts”) was strongly associated with total value of gifts received from PI. In addition to this, the total value of gifts received from PI was lower in trainees without prescribing responsibility compared to that in the trainees with independent prescribing responsibility.

#### 4. Discussion

This cross-sectional survey of European psychiatry trainees from 20 countries is the largest and first international study evaluating the interactions of psychiatric trainees with the pharmaceutical industry. With more than 1400 respondents, it provides a unique view of the current situation across Europe and allows for comparisons between countries. This is also the first study to investigate the exposure to PI interactions among trainees in child and adolescent psychiatry.

##### 4.1. The extent of interaction varies between countries

We have found that interactions vary significantly between countries and can go up to 240 interactions per month. Psychiatric trainees in Finland, Portugal, Turkey, and Romania were exposed to a much higher number of interactions than in the rest of Europe. For Portugal and Turkey, the high number of interactions may be driven by “embedded” pharmaceutical representatives, who stay in some of the teaching hospitals throughout the day and frequently interact casually with trainees in public areas, which may also explain the high range in the number of interactions. In comparison to Turkish data from 2007/2008 [12], the mean number of interactions have not changed substantially. However, the recent introduction of new guidelines or other factors may have decreased this practice both in Turkey as well as in Portugal after our sampling period.

##### 4.2. Other factors associated with interactions

Besides variations between countries, other characteristics were found to be associated with PI interactions: Trainees in CAP interacted less frequently with the PI and received gifts of a lesser value than adult psychiatry trainees. Furthermore, trainees without responsibility for independent prescribing reported to receive gifts with a lower total value. Thus, trainees seem to be more prone to gift-acceptance when prescribing independently and when new drugs have become available in a field – which is currently much less the case in CAP. Similar to previous studies [23,17], gifts related to work (e.g. textbooks, meals in educational contexts) were found to be considered more appropriate to accept than non-work related gifts (e.g. social dinners), which is also reflected in a higher value of received gifts when gifts were found to be work related.

##### 4.3. Trainees underestimate the prescribing impact of interactions

Participants in our study were more likely to believe that interactions with the pharmaceutical industry have higher impact on their peers than on themselves. This is in line with previous findings that physicians tend to judge the impact of interactions with the PI to be higher among their colleagues than among themselves [21,12,23,27]. We also found no correlation between the belief in an impact on prescribing behaviour (factor

“prescribing”) with the number of interactions or the estimated total value of gifts received. This demonstrates that European psychiatric trainees underestimate the impact of interactions, since even single sales visits were shown to have significant impact on prescribing [25].

##### 4.4. The perceived educational role of the pharmaceutical industry as driver of interactions

The belief in the educational role of pharmaceutical representatives was associated with a higher number of interactions. In line with this, acceptance of gifts was considered much more appropriate if the gifts were “work-related” or had educational value. Interactions took place more frequently if access to congress travel funds from PI was considered easy. Indeed, almost 40% of trainees stated to have received free or subsidized admission to conferences in the last twelve months. The number of interactions was also higher when they occurred with the aid of a senior psychiatrist, i.e. with the aid of somebody who regularly has a teaching function for trainees. These are important findings because access to educational opportunities and the role of senior psychiatrists are interaction-driving factors that are potentially modifiable. During presentations by the PI, only a third of trainees participated actively in the educational process by asking questions on the drug or eliciting information about the validity of the presented information. Training in critical appraisal of information may help to increase this number.

##### 4.5. Limitations

Our study has several limitations. As a post hoc, self-report questionnaire, it is subject to recall and reporting bias as well as social desirability bias. Furthermore, inherent to the observational design, it only allows statistical inference of factors facilitating interactions with the PI, but cannot provide definite evidence. Regarding the sampling method, no official data on the total number of psychiatric and CAP trainees is available for many countries in Europe and there is no centralized European database on psychiatric trainees that would allow randomisation. However, the ratio of male to female respondents, and adult psychiatry to CAP are within the expected range, arguing in favour of representativeness of our sample. Based on the annually updated country database of the EFPT, and the information provided by the national co-ordinators, we calculated the total number of psychiatric and CAP trainees in the 20 participating countries to be approximately 19,000. Our 1444 responses therefore amount to a response rate of approx. 7.5% of the total population of European psychiatric trainees. Sampling rates varied between countries, with countries with many psychiatric trainees (e.g. Germany) generally contributing lower sampling rates. In order to counteract this bias, analyses were statistically corrected for country. Overall, the predefined recruitment aim and response rate were met in all countries except for Belgium. The Belgian data was nonetheless included in the analysis since the sample covered approx. Twenty-two percent of the total Belgian trainee population (higher than 7.5% estimated average for total sample).

##### 4.6. The pharmaceutical industry and postgraduate psychiatric training

As indicated by the high number of personal interactions with pharmaceutical representatives that a psychiatry trainee has per month, pharmaceutical companies continue to contribute to medical education in Europe. However, this function should be reserved to educational institutions [1]. Consequently, current practices should be reviewed by the responsible authorities, senior

physicians and local trainees themselves, compliance with existing local conflict of interest regulations should be enforced at all levels and maximum transparency regarding conflicts of interest should be exercised. A recent study suggests that strict conflict of interest disclosure during residency training indeed decreases prescribing of heavily promoted and branded antidepressants [8]. Senior psychiatrist should be aware of their role as facilitators of PI interactions, reflect on their responsibility for shaping future psychiatrists, and help to create alternative, PI-independent educational opportunities. Likewise, psychiatric trainees are responsible for their own conduct and should not be misled e.g. by a sense of entitlement to PI gifts. For the future, specific teaching – beginning at the medical school level – should be dedicated to critical appraisal of research evidence including identification of biased information and the role of the pharmaceutical industry in influencing prescribing. In our sample, the number of interactions or extent of gift acceptance did not differ between different stages of training, indicating that interactions do not seem to simply disappear when trainees progress through psychiatric training. However, when specifically addressing the issue of industry interactions, even a one-time educational event may be effective in changing gift-accepting behaviour [23]. The World Health Organization and Health Action International have produced a practical guide for “Understanding and Responding to Pharmaceutical Promotion” which we recommend as a basis for creation of such a local educational module [28].

### Disclosure of interest

All authors are, or recently have been psychiatric trainees, who have at some point in their careers interacted with the pharmaceutical industry and accepted support from various pharmaceutical companies for attendance of educational events, meals and gifts in line with applicable national guidelines. Dr. Haravuori has received a lecture fee from Pfizer Oy and a grant for organization of a trainee congress from Oy Lundbeck Ab. Dr. Wuyts has received speaker fees from AstraZeneca. All other authors report to have no further competing interests.

### Acknowledgments

We thank M. Randall for permission to use the study questionnaire (original design by P. McKinney) and the European Federation of Psychiatric Trainees for the support of these research activities. Dr. Riese would like to thank for the support through the Swiss National Science Foundation SPUM grant 33CM30-124111. Dr. Guloksuz would like to thank for the support of the European Community's Seventh Framework Programme under grant agreement no. HEALTH-F2-2009-241909 (Project EU-GEI).

### Appendix A. Supplementary data

Supplementary data (Table S1) associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.eurpsy.2014.09.417>.

### References

- Angell M. Relationships with the drug industry: keep at arm's length. *BMJ* 2009;338:b222. <http://dx.doi.org/10.1136/bmj.b222>.
- Appelbaum PS, Gold A. Psychiatrists' relationships with industry: the principal-agent problem. *Harv Rev Psychiatry* 2010;18:255–65. <http://dx.doi.org/10.3109/10673229.2010.507038>.
- Appelbaum P, Arboleda-Florez J, Javed A, Soldatos C, Tyano S. WPA recommendations for relationships of psychiatrists, health care organizations working in the psychiatric field and psychiatric associations with the pharmaceutical industry. *World Psychiatry* 2011;10:155–9.
- Austad KE, Avorn J, Kesselheim AS. Medical students' exposure to and attitudes about the pharmaceutical industry: a systematic review. *PLoS Med* 2011;8:e1001037. <http://dx.doi.org/10.1371/journal.pmed.1001037.t003>.
- Austad KE, Avorn J, Franklin JM, Kowal MK, Campbell EG, et al. Changing interactions between physician trainees and the pharmaceutical industry: a national survey. *J Gen Intern Med* 2013. <http://dx.doi.org/10.1007/s11606-013-2361-0>.
- Ben Goldacre. *Bad Pharma: how medicine is broken and how we can fix it*. UK: HarperCollins; 2012 [1 pp.].
- Elliot C. *White Coat, Black Hat*. Boston, USA: Beacon Press; 2010 [1 pp.].
- Epstein AJ, Busch SH, Busch AB, Asch DA, Barry CL. Does exposure to conflict of interest policies in psychiatry residency affect antidepressant prescribing? *Med Care* 2012. <http://dx.doi.org/10.1097/MLR.0b013e318277eb19>.
- Etain B, Guittet L, Weiss N, Gajdos V, Katsahian S. Attitudes of medical students towards conflict of interest: a national survey in France. *PLoS ONE* 2014;9:e92858. <http://dx.doi.org/10.1371/journal.pone.0092858>.
- Freedman R, Lewis DA, Michels R, Pine DS, Schultz SK, et al. Conflict of interest – an issue for every psychiatrist. *Am J Psychiatry* 2009;166:274. [Available] <http://ajpp.psychiatryonline.org/article.aspx?Volume=166&Page=274&journalID=13>.
- Grande D, Shea JA, Armstrong K. Pharmaceutical industry gifts to physicians: patient beliefs and trust in physicians and the health care system. *J Gen Intern Med* 2011;27:274–9. <http://dx.doi.org/10.1007/s11606-011-1760-3>.
- Guloksuz S, Oral ET, Ulaş H. Attitudes and behaviours of psychiatry residents and psychiatrists working in training institutes towards the relationship between the pharmaceutical industry and physicians. *Turk Psikiyatri Derg* 2009;20:236–42.
- Hodges B. Interactions with the pharmaceutical industry: experiences and attitudes of psychiatry residents, interns and clerks. *CMAJ* 1995;153:553–9.
- Höschl C, Fialová L. European Psychiatric Association guidance on the conflicts of interest. *Eur Psychiatry* 2012;27:142–6. <http://dx.doi.org/10.1016/j.eurpsy.2011.09.003>.
- Insel TR. Psychiatrists' relationships with pharmaceutical companies: part of the problem or part of the solution? *JAMA* 2010;303:1192–3. [Available] <http://jama.jamanetwork.com/article.aspx?articleid=185560>.
- Jauhar S, Guloksuz S, Andlauer O, Lydall G, Marques J, et al. Choice of antipsychotic treatment by European psychiatry trainees: are decisions based on evidence? *BMC Psychiatry* 2012;12:27. <http://dx.doi.org/10.1176/appi.ps.95.5.30>.
- Korenstein D, Keyhani S, Ross JS. Physician attitudes toward industry, a view across the specialties physician attitudes toward industry. *Arch Surg* 2010;145:570–7. <http://dx.doi.org/10.1001/archsurg.2010.75>.
- Kuzman MR, Giacco D, Simmons M, Wuyts P, Bausch-Becker N, et al. Psychiatry training in Europe: views from the trenches. *Med Teach* 2012;34:e708–17. <http://dx.doi.org/10.3109/0142159X.2012.687481>.
- Lexchin J. Interactions between physicians and the pharmaceutical industry: what does the literature say? *CMAJ* 1993;149:1401–7.
- McKinney WP, Schiedermaier DL, Lurie N, Simpson DE, Goodman JL, et al. Attitudes of internal medicine faculty and residents toward professional interaction with pharmaceutical sales representatives. *JAMA* 1990;264:1693–7.
- Misra S, Ganzini L, Keepers G. Psychiatric resident and faculty views on and interactions with the pharmaceutical industry. *Acad Psychiatry* 2010;34:102–8. <http://dx.doi.org/10.1176/appi.ap.34.2.102>.
- Rabe-Hesketh S, Skrondal A, Pickles A. Maximum likelihood estimation of limited and discrete dependent variable models with nested random effects. *J Econometrics* 2005.
- Randall ML, Rosenbaum JR, Rohrbaugh RM, Rosenheck RA. Attitudes and behaviours of psychiatry residents toward pharmaceutical representatives before and after an educational intervention. *Acad Psychiatry* 2005;29:33–9. <http://dx.doi.org/10.1176/appi.ap.29.1.33>.
- Schulze TG, Treichel KC. The European Federation of Psychiatric Trainees (EFPT) – an integral part of the European harmonisation of psychiatric education and practise. *Eur Psychiatry* 2002;17:300–5.
- Schwartz TL, Kuhles DJ, Wade M, Masand PS. Newly admitted psychiatric patient prescriptions and pharmaceutical sales visits. *Ann Clin Psychiatry* 2001;13:159–62.
- Spurling GK, Mansfield PR, Montgomery BD, Lexchin J, Doust J, et al. Information from Pharmaceutical companies and the quality, quantity, and cost of physicians' prescribing: a systematic review. *PLoS Med* 2010;7:e1000352. <http://dx.doi.org/10.1371/journal.pmed.1000352.t009>.
- Steinman MA, Shlipak MG, McPhee SJ. Of principles and pens: attitudes and practices of medicine house staff toward pharmaceutical industry promotions. *Am J Med* 2001;110:551–7.
- Understanding and responding to pharmaceutical promotion – a practical guide (n.d.) Understanding and responding to pharmaceutical promotion – a practical guide. First edition. Available: <http://www.haiweb.org/11062009/drug-promotion-manual-CAP-3-090610.pdf>.
- Varley CK, Jibson MD, McCarthy M, Benjamin S. A survey of the interactions between psychiatry residency programs and the pharmaceutical industry. *Acad Psychiatry* 2005;29:40–6. [Available] <http://ap.psychiatryonline.org/article.aspx?articleID=48191>.
- Wadman M. Pharma payment probe widens its net. *Nature* 2008;455:1017. <http://dx.doi.org/10.1038/4551017a>.
- Wazana A. Physicians and the pharmaceutical industry: is a gift ever just a gift? *JAMA* 2000;283:373–80. <http://dx.doi.org/10.1001/jama.283.3.373>.
- Zheng X, Rabe-Hesketh S. Estimating parameters of dichotomous and ordinal item response models with glamm. *Stata J* 2007;7:313–33.