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IZVORNI ZNANSTVENI RAD
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Savitljiva mobilna djelomična zubna proteza: istraživanje o stajalištima i znanju doktora dentalne medicine u Grčkoj i Hrvatskoj

Flexible Removable Partial Denture Prosthesis: A Survey of Dentists' Attitudes and Knowledge in Greece and Croatia

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Sažetak

Svrha: U ovom su se istraživanju s pomoću upitnika željeli istražiti znanje, stajališta i moguće razlike u korištenju savitljivih pomičnih djelomičnih proteza (PDP) među doktorima dentalne medicine (DDM) u Grčkoj i Hrvatskoj. **Materijali i metode:** Upitnik od 16 pitanja sastavljen je izvorno na engleskome jeziku te je preveden na grčki i hrvatski dvosmjernim prevođenjem. Nakon toga testirani su smisao, točnost, jasnoća i homogenost prijevoda upitnika, a u tome je sudjelovalo nekoliko grčkih i hrvatskih doktora dentalne medicine koji govore engleski gotovo kao materinski jezik. Nakon potrebnih ispravaka upitnici su korišteni u dvjema *online* anketama koje su, zajedno s informacijom o anketi i upitom o pristanku ispitanika na anketu, poslane na e-adrese gotovo četiri tisuće doktora dentalne medicine u svakoj državi. Prikupljeni podatci analizirani su Hi-kvadrat testom uz razinu značajnosti od a = 0,05. **Rezultati:** U istraživanju je sudjelovalo 378 DDM-a iz Grčke i 304 iz Hrvatske. Njih 137 (36,2 %) iz Grčke i 56 (18,4 %) iz Hrvatske opskrbljivali su svoje pacijente savitljivim PDP-ima. Statistička analiza provedena među svim DDM-ima koji izrađuju savitljive proteze nije otkrila značajnu razliku među spolovima ($P > 0,05$), ali jest značajnu razliku među dobnim skupinama ($P < 0,01$), godinama rada u struci ($P < 0,05$), specijalizaciji ($P < 0,001$) te instruiranosti o savitljivim protezama ($P < 0,001$). Analiza među DDM-ima u objema državama pokazala je razliku u spolu i dobnim skupinama ($P < 0,01$), ali ne i među grupama DDM-a s više iskustva, specijalizacijom ili instruiranosti o savitljivim protezama ($P > 0,05$). **Zaključak:** Istraživanje je upozorilo na razlike među zemljama u postotcima DDM-a koji upotrebljavaju, odabiru i svojim pacijentima omogućuju izradu savitljivih PDP-a. Dob DDM-a, godine rada i instruiranost bili su povezani s opskrbom pacijenata savitljivim protezama, a udobnost, estetika i cijena bili su razlozi za odluku o uporabi savitljivih PDP-a. **Kliničke implikacije:** Premda DDM-i tijekom školovanja nisu educirani o savitljivim PDP-ima, njih gotovo trećina svojim pacijentima predlaže takvu vrstu terapije. Kako bi ovi protetski radovi bili dugoročno uspješni, potrebno je kliničko obrazovanje, više iskustva i svakako više istraživanja u ovom području.

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Ključne riječi
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Uvod

Funkcionalna i estetska rehabilitacija potpune ili djelomične bezubosti uključuje širok raspon terapijskih mogućnosti koje se razlikuju po stupnju invazivnosti i revezibilnosti, a povezane su i s rizicima i s koristi. Nekad pacijenti nisu mnogo očekivali od estetike i funkcionalnosti uobičajene pomične proteze. No danas su se očekivanja pacijenata bitno promijenila pa su zahtjevi, kad je riječ o estetici proteza, sve veći. To se osobito odnosi na pacijente suočene s djelomičnom bezubošću i posljedičnom uporabom metalnih kvačica

Introduction

Functional and esthetic rehabilitation of a completely or partially edentulous patient includes a battery of treatment modalities varying in the degree of invasiveness and reversibility along with the risks and benefits. In the past, patients had low expectations for the esthetic and functional outcomes of conventional removable dental prostheses. However, nowadays these expectations have changed leading to more patients demanding the esthetic aspect of their prostheses.

pomičnih djelomičnih proteza (PDP) u estetskom području. To je danas nepoželjno iz estetskih i psiholoških razloga pa je sve više pacijenata koji ih izbjegavaju ili ih jednostavno ne žele upotrebljavati (1,2). Kao odgovor na ove promjene u očekivanjima i zahtjevima pacijenata, proizvođači dentalnih materijala, doktori dentalne medicine i zubotehničari razvili su inovativne estetske materijale prirodnog izgleda, te nove metode za izradu pomičnih proteza.

Od 50-ih godina prošlog stoljeća termoplastične smole dostupne su za izradu PDP-a i pomičnih potpunih proteza (PPP) (3 – 7). Mnogi termoplastični materijali, poput najlona (poliamidi), poliestera (polietilentetraftalat), polikarbonata, akrilata (polimetil metakrilat), polipropilena i acetatnih smola (polioksimetilen), mogu se upotrebljavati za izradu savitljivih PDP-a (8,9). Od spomenutih materijala, najlon, te acetatne smole, polipropilen i akrilatne smole u široj su uporabi (1).

Termoplastične PDP-e uglavnom su poznati kao savitljive proteze, ali uobičajeni su i drugi nazivi, primjerice, proteze bez kvačica, bezmetalne proteze ili proteze s nemetalnim kvačicama (2). Proteze od ovih materijala trebale bi pokazati neke prednosti u odnosu na uobičajene akrilatne. Budući da su ovi materijali savitljivi, podminirana mjesta na alveolarnom grebenu mogu se iskoristiti za poboljšanje retencije, a i umetanje u usta mnogo je lakše, što je vrlo važno u slučaju mikrostomije (primjerice, pri sklerodermiji.). Kako su materijali otporni na plastičnu deformaciju i lom, baza proteze može biti tanja negoli kod klasične akrilatne proteze. Nema ni opasnosti od alergijske reakcije (nema zaostalog monomera), a poboljšana je i estetika jer su materijali transparentni pa omogućuju refleksiju boje sluznice. Također nema ni metalnih kvačica pa je proteza gotovo nevidljiva u ustima (10). Savitljive PDP-e obično ne sadržavaju nikakve metalne elemente (osim ako je metalna baza proteze kombinirana s termoplastičnim retentivnim elementima), a moguće je izraditi i estetske kvačice u boji zuba. Premda su savitljivi PDP-i dostupni dentalnoj medicini već gotovo 65 godina i u posljednja dva desetljeća intenzivno se reklamiraju, u literaturi nema podataka temeljenih na dokazima o njihovoj kliničkoj uporabi, praćenju uspješnosti ili učestalosti korištenja (1,8). Većina relevantnih članaka prikazi su slučajeva ili serije prikaza slučajeva i u njima se vrjednuju fizikalnomehanička svojstava termoplastičnih materijala (11 – 14). Kliničku učinkovitost i kako pacijenti prihvaćaju PDP-e ili PPP-e izrađene od najlona, u usporedbi s onima izrađenima od akrilatnih smola, procjenjivalo se tijekom 18 mjeseci u dva istraživanja (15, 16). U prvom istraživanju (15) autori su izvijestili o samo dvije frakture po središnjoj liniji, dok su mastikacija, fonetika i tolerancija na nošenje bile poboljšane kod savitljivih gornjih pomičnih proteza uz prirodne zube u nasuprotnoj čeljusti. Pacijenti su primijetili postupno blijeđenje boje gradivnog materijala i odljepljivanje zuba. U drugom istraživanju (16) u kojem je sudjelovalo 18 pacijenata koji su zamijenili akrilatne proteze savitljivima, svi su dali 100-postotnu prednost savitljivim protezama u svim mjerenim funkcijskim parametrima, poput iritacije sluznice, halitoze, lomova i udobnosti. Demografski podatci, odnosno podatci incidencije savitljivih PDP-a, bilježeni su tijekom četiri mjeseca

Particularly for the patients facing partial edentulism, the metal clasps of removable partial denture prostheses (RPDPs) in the esthetic area seem to be undesirable for both esthetic and psychological reasons with an increasing number of them avoiding and disliking their use (1, 2).

In response to this shift in expectations and demand, manufacturers and dental healthcare providers (dentists, dental technicians) have developed innovative, esthetic, natural-looking materials and methods for fabricating removable dental prostheses.

From the 1950s thermoplastic resins have been available and can be used to fabricate RPDPs or removable complete denture prostheses (RCDPs), (3-7). Many types of thermoplastic materials like nylon (polyamides), polyesters (polyethylene terephthalate), polycarbonates, acrylics (polymethyl methacrylate), polypropylenes and acetal resin (polyoxymethylene) can be used to fabricate flexible RPDPs (8, 9). From the aforementioned materials, nylon, acetal resin, polypropylene and acrylic resin are the most widely used (1).

Thermoplastic RPDPs have been mostly known as flexible dentures but other commonly used terms are non-clasp dentures, metal-free dentures, clasp free dentures and non-metal clasp dentures (2). Dentures made of these materials should show some advantages over the conventional acrylic ones. Since the materials are flexible, undercuts of the alveolar ridges can be engaged for improved retention and insertion in the mouth is much easier, which is especially important in cases of microstomia (e.g. scleroderma). Since the materials are resistant to plastic deformation and fracture, the denture base may be thinner than in classic acrylic dentures. Also, there is no risk of any allergic reaction (no residual monomer) with improved esthetics due to the transparency of the material that reflects the shade of the mucosa and the absence of metal clasps which makes dentures almost invisible in the mouth (10).

Flexible RPDPs typically do not contain any metal elements (unless a metal structure is combined with thermoplastic retentive elements) and tooth colored clasps are an esthetic option. Even though flexible RPDPs have been available to the dental profession for almost 65 years and have received much attention in the dental advertisements over the past two decades there is almost no evidence-based information in the relevant literature concerning clinical performance, follow-up or incidence data for these prostheses (1, 8). Most relevant articles focus on case or case series reports and evaluation of physicomechanical properties of thermoplastic materials (11-14).

The clinical performance and patient's acceptance of nylon RPDPs and RCDPs compared to acrylic resin ones were evaluated for 18 months in two studies (15, 16).

In the first study only two cases of midline fracture were reported, and mastication, phonetics and tolerance found to be improved with flexible maxillary dentures opposing natural mandibular teeth. Patients also reported gradual fading of color and teeth debonding. In the second among 18 patients who replaced their acrylic resin prostheses with flexible ones, they denoted 100% preference for the flexible dentures in all

u istraživanju koje je obuhvaćalo pet zubotehničkih laboratorija u Wisconsinu (SAD). Incidencija savitljivih PDP-a bila je 5,2 posto od ukupno izrađenih 903 PDP-a raznih tipova (17). Iz navedenoga je očito kako u relevantnoj literaturi nema dovoljno podataka i informacija o stajalištima, znanju i svjesnosti DDM-a o savitljivim PDP-ima.

Svrha ovog istraživanja bila je s pomoću upitnika istražiti znanje, stajališta i moguće razlike u korištenju savitljivih PDP-a među doktorima dentalne medicine u Grčkoj i Hrvatskoj.

Materijali i metode

Upitnik na engleskome jeziku sa 16 pitanja stvoren je online korištenjem *Polldaddy's survey toola* (www.polldaddy.com) i da bi bili sigurni kako je razumljiv, točan, jasan i homogen, testirali su ga grčki doktori dentalne medicine koji govore engleski gotovo kao materinski jezik. Nakon nužnih ispravaka, konačni oblik upitnika preveli su bilingvalni prevoditelji na grčki i hrvatski jezik, te je ponovno testiran i prema potrebi prilagođen određenom jeziku. Ovaj proces uključivao je dvosmjerno prevođenje (18). URL poveznice dvaju upitnika, također stvorene online s pomoću *Polldaddy's survey toola,* poslane su na e-adrese gotovo četiri tisuće doktora dentalne medicine u svakoj od zemalja s namjerom da se dobije odgovor oko 370 doktora dentalne medicine. Ovaj unaprijed definirani broj ispitanika baziran je na intervalu pouzdanosti (CI) od pet posto, odnosno na razini pouzdanosti od 95 posto. Broj od četiri tisuće označava ukupan broj DDM-a u Hrvatskoj te trećinu aktivnih DDM-a u Grčkoj (iz glavnih središta). Za istraživanja u obje zemlje dopuštenja su dale mjerodavne institucije (Grčka stomatološka udruga – Greek Dental Association i Etičko povjerenstvo Stomatološkog fakulteta Sveučilišta u Zagrebu).

Stvoreni online upitnici sadržavali su dihotomna i politomna (nominalna i redna) pitanja definiranih odgovora (pitanja zatvorenog tipa) i početnu poruku kojom su sudionici istraživanja obaviješteni o ciljevima istraživanja, te o povjerljivosti i anonimnosti podataka.

Većina pitanja obilježena su kao obvezatna, pitanja s rangiranim odgovorima bila su nasumično raspoređena i s jednog računala moglo se samo jedanput odgovarati na upitnik. Ishodišna, engleska inačica upitnika, nalazi se u tablici 1.

Stalno je praćen tijek istraživanja i broj DDM-a koji su odgovorili na upitnik, te su tijekom tri mjeseca poslane dvije elektroničke poruke s podsjetnicima za sudjelovanje u istraživanju kako bi se postigla ciljana veličina uzorka. Oba krozsekcijska (transverzalna) istraživanja bila su istodobna i završena su u isto vrijeme. Prikupljeni podatci vrjednovani su s obzirom na preciznost i konzistenciju te su statistički analizirani Hi-kvadrat testom s a = 0,05 granicom značajnosti.

Rezultati

U istraživanju je sudjelovalo 378 DDM-a iz Grčke (5 % CI) i 304 iz Hrvatske (5,4 % CI). Malobrojni ispitanici preskočili su barem jedno neobvezatno pitanje i zato se postotfunctional parameters evaluated, such as mucosal irritation, halitosis, fractures and comfort.

Demographic or incidence data of flexible RPDPs were reported in a survey of 5 dental laboratories in Wisconsin within a 4-month period. The incidence of flexible RPDPs was 5.2% of 903 RPDPs of all types fabricated (17).

From the aforementioned, the lack of data in the relevant literature is obvious and information on attitudes, knowledge and awareness of dentists towards flexible RPDPs. The purpose of this study was to investigate through a questionnaire the knowledge, attitudes and possible differences in the use of flexible RPDPs among dentists in Greece and Croatia.

Material and methods

An English questionnaire of 16 questions was originally created online using Polldaddy's survey tool (www.polldaddy.com) and tested for its apprehension, precision, clarity and homogeneity by a number of native English speaking Greek dentists. Following the necessary corrections, the final questionnaire was translated by bilingual professionals into Greek and Croatian language which was again tested and changed accordingly for best language adaptation. This process included two way translations (18). The URLs of the two questionnaires, also created online by Polldaddy's survey tool were sent by email to nearly 4000 dentists of each country, in order to have a response number of about 370 dentists, a predefined sample size based on a 5% confidence interval (CI) and 95% confidence level. The number of 4000 represents the total number of dentists in Croatia and the 1/3 of active dentists in Greece, from most of its major areas. For both surveys permission was given by the respective authorities (Greek Dental Association, Ethics Committee of the School of Dental Medicine, University of Zagreb).

The created online surveys contained dichotomous and polytomous (nominal and ordinal) closed-ended questions, and a start message informing the participants about the aims of the study, its confidentiality and anonymity. Most of the questions were signed as mandatory, rank ordered questions were randomized and only one response per computer was allowed. The English questionnaire is given in Table I.

Progress and response rate of the survey was monitored and 2 reminding emails were sent before the reach of the final sample units number, in a period of 3 months. Both cross-sectional surveys took place and completed about the same period of time. Collected data were evaluated for their accuracy and consistency and analyzed statistically by chi-square tests at a=.05 level of significance.

Results

378 dentists from Greece (5% CI) and 304 from Croatia (5.4% CI) participated in the study. A small number of respondents skipped at least one non-obligatory question and

Tablica 1. Engleski upitnik pripremljen kao osnova za prijevod na grči i hrvatski
Table 1 The English questionnaire prepared as the base for the Greek and Croatian

1. Your sex
Male ☐ Female ☐
2. Your age
<36 ☐ 36-45 ☐ 46-55 ☐ 56-65 ☐ >65 ☐
3. Years of practicing dentistry
0-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ 21-25 ☐ 26-30 ☐ 30 ☐
4. School of graduation
Athens ☐ Thessaloniki ☐ Other ☐ ……. / Zagreb ☐ Rijeka ☐ Other ☐ ……..
5. Are you practicing …
General dentistry ☐ Dental specialty ☐ define …….
6. Rank your preference for RPDP types when all could be used
Metallic framework ☐ Flexible ☐ Acrylic ☐
7. Have you ever been instructed the concept of flexible dentures?
Yes ☐ No ☐
8. How often do you provide flexible dentures?
Never ☐ Rarely ☐ Quite often ☐ Flexibles only ☐
9. Rank the following reasons for your decision to provide a flexible denture
Better aesthetics ☐ More comfort for the patient ☐ Less fabrication time ☐
Allergy to metals ☐ Less cost ☐
10. Your flexible dentures are planned for …
Temporary use only ☐ Permanent use only ☐ Both ☐
11. The decision to make a flexible denture is taken by …
You ☐ The patient ☐
12. Do you know the commercial name of the product you are using for the construction of flexible dentures
No ☐ Yes ☐ give us the name ……..
13. What problems have you noticed during the use of flexible dentures
Discoloration of the base ☐ Clasp fracture ☐ Debonding of teeth ☐
Fracture of the base ☐ None ☐ Other ……..
14. Which of the following reasons was mostly responsible for the replacement of a flexible denture.
Reasons related to teeth and abutments ☐ Reasons related to flexible base material ☐
Reasons related to gums/oral mucosa ☐
15. The replacement of the flexible denture was done in …
<1 year ☐ 1-2 years ☐ 3-4 years ☐ 5-6 years ☐ >6 years ☐
16. How satisfied you were from the overall usage of flexible dentures, one year after placement.
Not at all ☐ Little ☐ Enough ☐ Much ☐ Very much ☐

ci temelje na stvarnom broju ispitanika koji su odgovorili na pojedino pitanje. U tablici 2. nalaze se detalji o spolu, dobi, godinama rada u struci, specijalizaciji, instruiranosti (poduci) i primjeni savitljivih proteza za sve uključene ispitanike. Statistička analiza (Hi-kvadrat test) pokazala je značajnu razliku između dvaju ciljanih uzoraka u odnosu na većinu navedenih parametara, osim za specijalizaciju i instruiranost o savitljivim protezama (tablica 2.).

O pružanju usluge izrade savitljivih PDP-a svojim pacijentima, kao terapijske mogućnosti, pozitivno se izjasnilo 137 DDM-a Grčke i 56 iz Hrvatske (tablica 3.). Profil i razlike između DDM-a u dvjema zemljama prikazani su u tablici 3. Statistička analiza koja je objedinila sve DDM-e pokazala je da nema značajne razlike između spolova (P > 0,05), ali postoji značajna razlika između dobnih skupina (P < 0,01), godina rada u struci (P < 0,05), specijalizacije (P < 0,001) i instruiranosti o savitljivim PDP-ima (P < 0,001) (tablica 3.). Analiza između dviju zemalja pokazala je razlike kad je riječ

for this reason the percentages were based on the actual number of respondents for each question. Table II shows details for gender, age, years in practice, specialty, instruction (taught) and provision of flexible dental prostheses of all respondents. Statistical analysis (chi square test) revealed significant differences between the two target samples in respect to most of the above parameters, except for the specialists and the instructed to flexibles respondents (Table II).

137 dentists from Greece and 56 from Croatia responded positively for providing flexible RPDPs as part of their treatment options offered (Table II). Their profile and differences between the two countries are shown in Table III. Statistical analysis for all the providers together, indicated no significant difference between genders (P>.05), but significant differences between age groups (P<.01), years in practice (P<.05), specialization (P <.001), and instruction on flexible prostheses (P <.001) (Table III). Analysis between the two countries showed differences for gender and age grou-

Tablica 2. Profil ispitanika i razlike između dviju država
Table 2 Respondents' profiles and differences between the two countries.

Pojam • Item	Grupe • Group	Grčka • Greece broj (%) • no (%)	Hrvatska • Croatia broj (%) • no (%)	Ukupno • Total broj (%) • no (%)	$P_{Gr\text{-}Cr}$
Spol • Sex	Muškarci • Male	232 (62.4)	86 (28.9)	318 (47.5)	<.001
	Žene • Female	140 (37.6)	211 (71.1)	351 (52.5)	
Dob • Age	<36	99 (26.6)	123 (41.4)	222 (33.2)	<.001
	36-45	121 (32.5)	77 (25.9)	198 (29.6)	.063
	>45	152 (40.9)	97 (32.7)	249 (37.2)	.029
Godine staža u struci • Years in practice	<11	124 (33.3)	139 (46.8)	263 (39.3)	<.001
	11-20	114 (30.6)	73 (24.6)	187 (28.0)	.082
	>20	134 (36.1)	85 (28.6)	219 (32.7)	.043
Specijalizacija • Specialty	Ne • No	294 (79.2)	253 (85.2)	547 (81.9)	.048
	Da • Yes	77 (20.8)	44 (14.8)	121 (18.1)	
Sklonost izradi proteze • Preference	Metalna • Metallic	246 (78.3)	191(71.4)	437 (69.1)	.001
	Akrilatna • Acrylic	49 (13.0)	64 (14.2)	113 (17.9)	.045
	Savitljiva • Flexible	33 (8.7)	49 (14.4)	82 (13.0)	.024
Instruiran o savitljivim PDP-ima • Instructed in flexibles	Ne • No	309 (83.3)	251 (86.0)	560 (84.5)	.346
	Da • Yes	62 (16.7)	41 (14.0)	103 (15.5)	
Opskrbljuje pacijente savitljivim PDP-ima • Provision of flexibles	Ne • No	235 (63.2)	240 (81.1)	475 (71.1)	<.001
	Da • Yes	137 (36.8)	56 (18.9)	193 (28.9)	

$P_{Gr\text{-}Cr}$= c vjerojatnost za razliku u postotcima ispitanika između zemalja • probability for differences in respondent's percentages between countries.

Tablica 3. Broj i postotci* ispitanika koji opskrbljuju pacijente savitljivim PDP-ima; razvrstani prema spolu, dobi, godinama rada u struci (staž), specijalizaciji i instruiranosti (podučenosti) o konceptu savitljivih proteza
Table 3 Number and percentages* of respondent's provision of flexible RPDPs according to their sex, age, years in practice, specialization and instruction.

Grupe • Groups	Grčka • Greece Broj (%) • No (%)	Hrvatska • Croatia Broj (%) • No (%)	Ukupno • Total Broj (%) • No (%)	$P_{Gr\text{-}Cr}$
Muškarci • Male	84 (36.2)[a]	16 (18.6)[a]	100 (31.4)[a]	.003
Žene • Female	53 (37.8)[a]	40 (18.9)[a]	93 (26.5)[a]	<.001
Dob < 36 g. • Age <36 y	29 (29.3)[a]	24 (19.5)[a]	53 (23.9)[a]	.089
Dob 36–45 g. • Age 36-45 y	45 (37.2)[a]	15 (19.5)[a]	60 (30.3)[ab]	.008
Dob > 45 g. • Age >45 y	63 (41.4)[a]	17 (17.5)[a]	80 (32.1)[b]	<.001
Staž < 11 g • Practice <11 y	40 (32.2)[a]	25 (18.0)[a]	65 (24.7)[a]	.007
Staž 11 –20 g. • Practice 11-20	37 (32.4)[a]	15 (20.5)[a]	52 (27.8)[ab]	.076
Staž > 21 g. • Practice >21y	60 (44.8)[b]	16 (18.8)[a]	76 (34.7)[b]	<.001
Opći praktičar • GPractitioner	120(40.8)[a]	38 (15.1)[a]	158 (28.9)[a]	<.001
Specijalist • Specialist	17(22.1)[b]	7 (15.9)[a]	24 (19.8)[b]	.413
Neinstruiran • Not instructed	90 (29.1)[a]	23 (9.2)[a]	113 (20.2)[a]	<.001
Instruiran • Instructed	47 (75.8)[b]	22 (53.6)[b]	69 (67.0)[b]	.512

*Percentages are based on respondent's number in each group to the number of all respondents in the group for each country.
Column $P_{Gr\text{-}Cr}$ shows statistical differences between countries in the frequencies for the same horizontal group.
Different superscript letters indicate statistical differences between groups in each item of the same column. Same letters mean no difference at a = .05.

o spolu i dobnim skupinama (P < 0,01), ali nije bilo razlike između skupina iskusnijih DDM-a (11 – 20 godina rada u struci), onih sa specijalizacijom i DDM-a instruiranih o PDP-u (P > 0,05).

Sklonost ispitanika prema vrsti PDP-a zabilježena je kao težinski rang. PDP-i s metalnom bazom imali su najniži, odnosno najbolji rezultat (1,40), savitljivi PDP-i drugi najniži (2,14), a akrilatne proteze najviši, odnosno najlošiji (2,45) rezultat. Razlozi za odabir savitljivih PDP-a također su rangirani i težinski rezultati pokazali su da je *veća udobnost za pacijenta* (2,85) razlog s najnižim rezultatom, a slijedili su *bolja estetika* (2,91), *kraće vrijeme izrade* (3,00), *alergija na metal* (3,06) i *po-*

ps (*P*<.01) but no differences between the more experienced (over 11y), specialized or instructed groups (*P* >.05).

The preference of respondents for RPD type was recorded as weighted ranks. RPDPs with metallic framework had the lowest (best) score (1.40), flexibles the second lowest (2.14) and acrylics the highest (worst) (2.45). The reasons for provision of flexible RPDPs were also ranked and the weighted scores showed that "more comfort for the patient" was the reason with the lowest score (2.85), followed by "better esthetics" (2.91), "less fabrication time" (3.00), "allergy to metal" (3.06) and "less cost" (3.16). Statistical analysis showed that preferences for RPDPs were significantly different

voljnija cijena (3, 16). Statistička analiza pokazala je da je sklonost prema uporabi savitljivih PDP-a bila značajno različita (P < 0,001), ali ne i razlozi za odluku o izradi savitljivoga PDP-a (P > 0,05). Nije pronađena značajna razlika između dviju zemalja bilo u sklonostima (P > 0,05), bilo u razlozima za izradu savitljivih PDP-a (P > 0,05). Razlozi za izradu ili zamjenu savitljivih PDP-a, prema navodima ispitanika, prikazani su u tablici 4. Većinu savitljivih PDP-a preporučio je DDM, te su planirani i kao privremeni i kao trajni nadomjestak. Najčešće korišteni materijal za izradu savitljivih PDP-a bio je poliamid (87 % u Grčkoj i 37 % u Hrvatskoj). Njihova svojstva nakon godine dana korištenja bila su zadovoljavajuća za DDM-e, a problemi koji su se pojavili tijekom funkcije u ustima bili su povezani s promjenom boje osnovnog materijala, lomom kvačica i odljepljivanjem zuba. Gotovo polovina ispitanika povezuje zamjenu savitljivoga PDP-a s problemima zuba nosača, te je više od 50 posto radova zamijenjeno nakon dvije godine korištenja. Tablica 4. prikazuje razlike između dviju zemalja (P_{Gr-Cr}) zajedno s razlikama među grupama kad je riječ o istim pitanjima (*natpisne* oznake u stupcima).

(*P*<.001), but reasons for deciding the flexible RPDPs were not (*P*>.05). No significant differences between the two countries were noted, either for the preferences (*P*>.05) or for the reasons (*P*>.05).

The reasons according to respondents, for providing and replacing flexible RPDPs are shown in Table IV. Most flexibles were recommended by the dentist, and planned to be used as both provisional and permanent appliances. The material mainly used for the fabrication of flexible RPDPs was polyamide (87% in Greece and 37% in Croatia). Their performance after 1 year in place was satisfying for the dentists and the problems they presented during their functioning in the mouth were related to discoloration of the base, fracture of clasps and debonding of teeth. Nearly half of the respondents relate the replacement of the flexible RPDPs to problems in abutments and more than 50% replaced after 2 years of use. Table IV also shows the differences between the two countries (P_{Gr-Cr}) along with the differences between the groups of the same question (column superscripts).

Tablica 4. Razlozi za izradu i zamjenu savitljivih PDP-a
Table 4 Reasons for providing and replacing flexible RPDPs

Pitanje • Question	Odgovor • Answer	Grčka • Greece Broj (%) • No (%)	Hrvatska • Croatia Broj (%) • No (%)	Ukupno • Total Broj (%) • No (%)	P_{Gr-Cr}
Odluka o izradi • Decided by	Doktor DM • Dentist	117 (90.7)[a]	26 (56.3)[a]	143(81.2)[a]	<.001
	Pacijent • Patient	12 (9.3)[b]	21 (44.7)[a]	33 (18.8)[b]	
Korištena kao • Used as	Provizorij • Provisional	41 (31.3)[b]	5 (10.9)[b]	46 (26.0)[a]	.007
	Trajna • Permanent	25 (19.1)[c]	19 (41.3)[a]	44 (24.8)[a]	.003
	Oboje • Both	65 (49.6)[a]	22 (47.8)[a]	87 (49.1)[b]	.834
Razlog izrade savitljive proteze • Reasons for roviding flexibles	Estetika • Esthetics	40 (29.4)[a]	11 (19.6)[b]	51 (26.6)[ab]	.164
	Ugoda • Comfort	35 (25.7)[a]	26 (46.4)[a]	61 (31.8)[a]	.005
	Cijena • Cost	33 (24.3)[a]	8 (14.3)[b]	41 (21.3)[b]	.125
	Vrijeme • Time	10 (7.3)[b]	4 (7.1)[b]	14 (7.3)[c]	.959
	Alergija • Allergy	18 (13.2)[b]	7 (12.5)[b]	25 (13.0)[c]	.891
Primijećeni problemi (od 123 ispitanika u Grčkoj i 46 u Hrvatskoj) • Problems Noticed (by 123 in Greece and 46 in Croatia)	Obojenje baze • Base Discoloration	78 (63.4)[a]	23 (50.0)[ab]	101(59.8)[a]	.113
	Lom kvačice • Clasp fracture	48 (39.0)[b]	18 (39.1)[b]	66 (40.2)[b]	.990
	Ispadanje zuba • Tooth Debonding	25 (20.3)[c]	18 (39.1)[b]	43 (25.4)[c]	.012
	Lom baze • Base fracture	9 (7.3)[d]	7 (15.2)[c]	16 (9.5)[d]	.118
	Ostalo • Other	24 (19.5)[c]	12 (26.1)[bc]	36 (21.3)[c]	.363
	Ništa • None	19 (15.4)[c]	0 (0.0)	19 (11.2)[d]	.005
Razlozi za zamjenu • Replacement reasons	Zubi • Teeth	57 (42.2)[a]	12 (38.7)[a]	69 (41.6)[a]	.720
	Mukoza • Mucosa	36 (26.7)[b]	12 (38.7)[a]	48 (28.9)[b]	.182
	Materijal • Material	42 (31.1)[ab]	7 (22.6)[a]	49 (29.5)[b]	.348
Vrijeme zamjene • Replacement time	0-2 god • 0-2y	54 (52.9)[a]	11 (33.3)[a]	62 (46.3)[a]	.050
	3-4 god • 3-4y	21 (20.6)[b]	11 (33.3)[a]	32 (23.9)[b]	.135
	5-6 god • 5-6y	11 (10.8)[b]	10 (30.3)[a]	21(15.7)[bc]	.007
	>6 god • >6y	16 (15.7)[b]	1 (3.0)[b]	17 (12.7)[b]	.057
Zadovoljstvo nakon 1 god • Satisfied after 1 y	Malo ili nikakvo • No or Little	31 (23.7)[b]	3 (6.5)[b]	34 (19.2)[b]	.011
	Dovoljno i više • Enough or More	100 (76.3)[a]	43 (93.5)[a]	143(80.8)[a]	

Stupac P_{Gr-Cr} pokazuje statističke razlike između zemalja u frekvencijama za istu skupinu. • Column P_{Gr-Cr} shows statistical differences between countries in the frequencies for the same group.
Različita slova u natpisu (superskriptu) upućuju na statističke značajnosti između skupina u svakom pitanju (stavci) istog stupca. • Different superscript letters indicate statistical differences between groups in each item of the same column.
Ista slova znače kako nema razlike pri a = 0,05 • Same letters mean no difference at a = .05.

Rasprava

U ovom istraživanju proučavala su se stajališta i znanje o savitljivim PDP-ima među DDM-ima u dvjema europskim državama – Grčkoj i Hrvatskoj. Rezultati su pokazali da je samo jedan od šest, među svim ispitanicima, instruiran o konceptu savitljivih PDP-a, ali jedan od troje pruža takve usluge pacijentima kao alternativu klasičnim akrilatnim protezama ili protezama s metalnom bazom. Ustanovljeno je da je opskrba pacijenata savitljivim protezama povezana s dobi DDM-a i godinama njihova staža u struci te sa specijalizacijom i instruiranošću o savitljivim protezama, ali ne i o njihovu spolu. Pronađena je razlika između dviju zemalja u opskrbi pacijenata savitljivim protezama, ali ne i u postotku instruiranih DDM-a. Razlika u opskrbi veća je u Grčkoj negoli u Hrvatskoj za oba spola DDM-a, dob iznad 45 godina, za one s više godina rada u struci, za opće praktičare i za instruirane ispitanike/a PDP-e su preporučivali DDM-i stariji od 45 godina, oni s više godina rada u struci, opći praktičari i instruirani ispitanici. Među svim ispitanicima, jedan od njih deset preferira savitljive proteze umjesto PDP-e s metalnom bazom, a razlozi su veća udobnost, bolja estetika i cijena za njihove pacijente. Nije bilo značajne razlike u sklonostima i razlozima opskrbe pacijenata savitljivim protezama između dviju država, osim kad je riječ o udobnosti. Nije ustanovljeno da spol ima značajnu ulogu u opskrbi pacijenata savitljivim PDP-ima, čak ni unutar država. Opskrba pacijenata savitljivim PDP-ima u postocima je u oba spola bila viša u Grčkoj negoli u Hrvatskoj, što se može objasniti činjenicom da se savitljivi PDP-i češće izrađuju u Grčkoj (36,8 %) negoli u Hrvatskoj (18,9 %). Istaknuto je da dob ima značajnu ulogu u opskrbi pacijenata savitljivim PDP-ima, ali ne i unutar zemalja. Stariji DDM-i češće opskrbljuju pacijente savitljivim PDP-ima, što znači da mlađi praktičari nevoljko prihvaćaju nove tehnike. Godine rada u struci, čini se, imaju isti distribucijski oblik kao i dob DDM-a. Grčki ispitanici pokazali su znatno povećanje izrade savitljivih PDP-a s porastom dobi. Ako godine rada u struci znače i više iskustva za ispitanike, onda DDM-i s više iskustva mnogo lakše opskrbljuju pacijente savitljivim protezama negoli oni manje iskusni. O ovakvom nalazu izvijestili su i Hill i njegovi suradnici (1).

Pronađeno je također da specijalizacija negativno utječe na opskrbu pacijenata savitljivim PDP-ima i da je više općih praktičara negoli specijalista opskrbljivalo svoje pacijente savitljivim protezama. Budući da još nema dovoljno kliničkih dokaza o korištenju savitljivih PDP-a, reklamna literatura možda više utječe na opće praktičare kako bi usvojili ovu terapijsku metodu, zaključio je to i Hill sa suradnicima (1). No to se ne odnosi na hrvatski uzorak u kojem su obje grupe opskrbljivale pacijente savitljivim PDP-ima u istom postotku. Objašnjenje za ovaj nalaz može biti razlika u broju ispitanika instruiranih o savitljivim PDP-ima, među specijalistima 20,4 % i nespecijalistima 12,9 %. Instruiranost ima veliku ulogu u opskrbi pacijenata savitljivim PDP-ima o čemu će se raspravljati u daljnjem tekstu. Instruiranih praktičara koji opskrbljuju pacijente savitljivim protezama tri je puta više negoli onih koji nisu instruirani. To je očekivani rezultat, jer oni neinstruirani nevoljko preporučuju i opskrblju-

Discussion

This study investigated the attitudes and knowledge about flexible RPDPs among dentists in two European countries, namely Greece and Croatia. The results revealed that only 1 out of 6 of all respondents were instructed about the flexible RPDPs concept, but 1 out of 3 do provide a flexible prosthesis as an alternative to the conventional metallic or acrylic one. Provision of flexibles was found to be associated with age, years of practice, specialization and instruction to flexibles of the respondent practitioners but not with their gender. A difference was found between the two countries in the provision of flexibles, but not in the percentage of instructed practitioners. The difference in the provision is higher in Greece than in Croatia for both genders, for ages over 45, for those with more years in practice, for general practitioners and for not instructed respondents. Among all, 1 out of 10 seemed to prefer flexibles in place of metallic RPDPs and the reasons were comfort, esthetics and cost for their patients. No significant differences for the preferences and the reasons were noticed between the two countries, except for comfort.

Gender did not play a significant role in the provision of flexibles, even within the countries. Percentages for both genders were higher in Greece than in Croatia and this can be explained by the fact that provision of flexibles in general was higher in Greece than in Croatia (36.8% and 18.9% respectively). Age played a significant role in the provision of flexibles but not within countries. Older practitioners provide flexibles in higher percent, meaning that younger practitioners are more reluctant to adopt new techniques. Years in practice seems to follow the same general pattern as age. Greek respondents present also a significant increase with age. If years in practice means more experience for the respondents, then practitioners with more experience seem to provide flexible prostheses more easily than the less experienced. This is also reported by Hill et al (1). Specialization was found to play a negative role in the provision of flexibles since more general practitioners than specialists provided flexible prostheses to their patients. Because there is still not enough clinical evidence for the use of flexibles, promotional literature may affect more general practitioners to adopt this treatment method, as Hill et al. also noted (1). Although this does not apply to the Croatian sample, where both groups provide flexible prostheses in the same percentage, an explanation can be given by the difference of instructed respondents contained in the specialists (20.4%) and not-specialists (12.9%) groups. Instruction plays a significant role in the provision to flexibles, as is discussed below.

Instructed practitioners providing flexibles are 3 times more than not instructed. This is actually expected, since not-instructed are more reluctant to recommend and provide flexibles due to the absence of experience and education.

In general, 1out of 3 respondents prefer flexibles and acrylic prostheses in place of metallic ones and this is in agreement with the results of Pun et al. (17) survey. Flexible prostheses were decided on differently in the two countries. The decision in Greece was made mostly by the dentists

ju pacijente savitljivim protezama zbog nedovoljno iskustva i podučenosti. Općenito, jedan od triju ispitanika preferira savitljive i akrilatne proteze u odnosu na one s metalnom bazom, što se podudara s rezultatima istraživanja Puna i suradnika (17). O indikaciji za izradu savitljivih proteza različito se odlučuje u dvjema zemljama. Odluku su u Grčkoj uglavnom donosili DDM-i, a u Hrvatskoj su na odluku utjecali podjednako pacijenti i DDM-i. Takav rezultat vjerojatno je dobiven zbog nekih razlika u pružanju stomatoloških usluga u dvjema državama. U Grčkoj se savitljive proteze planiraju i primarno koriste kao privremene proteze, a u Hrvatskoj kao trajni rad. U konačnici, gledajući ukupno, i privremena i trajna namjena bile su gotovo podjednake. Glavni razlog za izradu savitljivih proteza bila je udobnost za pacijenta, estetika i cijena, s gotovo istim postotcima među različitim grupama ispitanika i s vrlo malim razlikama između dviju zemalja. Problemi povezani sa savitljivim protezama bili su promjena boje baze proteze, fraktura kvačica i odljepljivanje zuba. Postotni udjel problema bio je isti u objema zemljama. Razlozi za zamjenu savitljivih proteza – u silaznom nizu, povezani su s problemima zuba nosača, materijalom proteze i na kraju s potpornim tkivima. Zadovoljstvo nakon godine dana korištenja savitljivih proteza bilo je visoko u objema zemljama, premda nešto više u Hrvatskoj negoli u Grčkoj.

Iz navedenoga jasno je da postoje razlike između dviju zemalja u korištenju savitljivih proteza. Upute za njihovo korištenje češće su dane u promotivnoj literaturi proizvođača i zubnih laboratorija negoli akademskih institucija. To bi mogao biti razlog zašto mlađi, manje iskusni praktičari ne preporučaju savitljive proteze. Također, malo je dokaza o njihovoj kliničkoj uporabi, svojstvima i trajnosti. Zato su hitno potrebna klinička istraživanja kako bi se ustanovila njihova vrijednost tijekom dugoročnog korištenja te zadovoljstvo pacijenata, zajedno s tehnikama koje bi prevladale probleme vezane za korištenje gradivnih materijala savitljivih proteza.

Zaključak

Ovo istraživanje o korištenju savitljivih PDP-a upozorilo je na razlike između dviju država u broju DDM-a koji odabiru i opskrbljuju svoje pacijente ovom vrstom proteza kao alternativom za PDP-e s metalnom bazom. Samo od jedne petine do jedne trećine praktičara opskrbljuje svoje pacijente savitljivim PDP-ima, ali više od 75 posto njih zadovoljno je njihovim svojstvima nakon godine dana korištenja. Dob, godine rada u struci i instruiranost praktičara povezani su s opskrbom pacijenata ovim protezama, a udobnost, estetika i cijena bili su glavni razlozi za odluku o njihovoj izradi. Glavni su problemi, prema učestalosti, promjena boje baze proteze, lom kvačica i odljepljivanje zuba.

Sukob interesa

Nije bilo sukoba interesa.

whereas in Croatia the patients seemed to affect the decision equally to dentists. This is probably due to some differences in the provision of dental care between the two countries. Flexibles planned to be used primarily as provisional prostheses in Greece and as permanent in Croatia, although in total, permanent and provisional use was found equal. The main reasons for providing flexible prostheses were comfort for the patient, esthetics and cost, with almost the same percentage between respondents and with only small differences between the two countries. The problems related to the flexibles were discoloration of the base, fracture of clasps and debonding of teeth. Problem percentages were the same in both countries. The reasons for replacing flexible prostheses were reported to be related in a decreasing order with problems in abutment teeth, denture base material and finally the supporting tissues. Satisfaction after 1 year in place of flexibles was high in both countries. However, the satisfaction was higher in Croatia than in Greece.

From the abovementioned, it is evident that there are differences between the two countries in the use of flexible prostheses. Instructions for their use are given by promoting literature provided by manufacturing companies, dental laboratories and not by academic institutions. That could be the reason why younger, less experienced dentists do not recommend flexible prostheses. Also, little evidence exists on their clinical usage, performance and duration. For these reasons, clinical studies are urgently needed to investigate their value in long term performance and patients' satisfaction along with techniques overcoming material inherited problems.

Conclusion

This survey on the use of flexible RPDPs indicated differences between the two countries in the number of dentists using, selecting and providing these dentures as an alternative to metallic RPDPs for their patients. Only 1/5 to 1/3 of the practitioners provide flexible RPDPs for their patients but over 75% of them were satisfied with their performance after 1 year. Age, years in practice and instruction of the practitioner are all related to the provision of these dentures, while comfort, esthetics and cost were the main reasons for deciding flexible RPDPs for their patients. Base discoloration, clasp fracture and tooth debonding were their main problems in a decreasing order.

Conflict of interest

None declared

Abstract

Purpose: The aim of this study was to investigate through a questionnaire the knowledge, attitudes and possible differences in the use of flexible RPDPs among dentists in Greece and Croatia. **Material and Methods:** A questionnaire of 16 questions was originally created in English, translated into Greek and Croatian language following a two way translation and tested for apprehension, precision, clarity and homogeneity by a number of native English speaking Greek and Croatian dentists. Following the necessary corrections, the questionnaires replicated in two online surveys and their addresses with an informed consent were sent by emails to nearly 4000 dentists in each country to participate. Collected data were analyzed by chi-square tests at a= .05 level of significance. **Results:** 378 dentists from Greece and 304 from Croatia participated in the study. 137(36.2%) dentists from Greece and 56(18.4%) from Croatia provided flexible RPDPs to their patients. Statistical analysis for all providers indicated no significant difference between genders (P>.05), significant differences between age groups (P<.01), years of practice (P<.05), specialization (P <.001), and instruction on flexible prostheses (P <.001). The analysis between the two countries showed differences for gender and age groups (P<.01) but no differences between experienced, specialized or instructed groups (P >.05). **Conclusion:** The survey indicated differences between the two countries in the percentages of dentists using, selecting and providing RPDPs for their patients. Practitioners' age, years in practice and instruction were associated with the provision of the prostheses, while comfort, esthetics and cost were the reasons for deciding to use the flexible RPDPs. **Conclusion:** Although dentists are not educated in their schools about flexible RPDPs, almost a third of them offer this treatment to their patients. Long term success of these devices depends on clinical education, more experience and definitely more research.

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