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EVROPSKO FUDBALSKO PRVENSTVO 2020/2021: ANALIZA POSTIGNUTIH GOLOVA I EVALUACIJA STATISTIČKIH PARAMETARA NA UTAKMICAMA[1]

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Apstrakt: Cilj studije bio je analiza karakteristika postignutih golova na turniru u smislu specifičnog načina vrednovanja. Na uzorku od 51 utakmice i učešća 24 reprezentacije, ova studija je bazirana na personalnoj opservaciji istraživača, odnosno analiza se bazirala na praćenju utakmica uživo putem domaćih kablovskih kanala, kao i na UEFA službenom YouTube kanalu. Dvosmerna analiza varijanse između grupa je korišćena za obradu dela podataka. Ukupno su postignuta 142 gola. Fiksni faktor prikazao je najveću zastupljenost golova u periodu od 45-60 minuta (30), dok su fiksni faktori uključivali vrste napada i broj postignutih golova: (80) kontinuirani napadi (srednja vrednost = 53.7 minuta), (13) brzi napadi (59.5 minuta), (14) kontranapadi (55.7 minuta) i (35) set igre ili prekidi (51.8 minuta). Jedan završni dodir je procenjen (80 ili 65.6%), a dva dodira (17 ili 13.9%). Najveći broj pogodaka (37) postignut je unutrašnjom stranom stopala (srednja vrednost = 53.5 minuta) poredeći sa (27) kod udarca lopte glavom (54.4 minute) i (21) kod udarca lopte sredinom hrpta stopala (49.5 minuta). Najviše golova postignuto je desnom nogom (66 ili 46.5%), tj. (90) golova je postignuto unutar šesnaest metara (van peterca) (54.1 minut). Prvi gol dao je vrednost (33 ili 64.7%) konačne pobede na meču. Dobijeni rezultati trenerima ukazuju da bi se trebali fokusirati na brze napade, i kontranapade koji posledično vode postizanju golova. Takođe se mora obratiti pažnja i na više udaraca lopte spoljnom stranom stopala i spoljnom stranom hrpta stopala.

Ključne reči: *indikatori fudbalskih performansi, tehnički elementi, taktički elementi, gol, video analiza*

1. UVOD

Postizanje gola u fudbalu najvažnija je determinanta ofanzivnog uspeha, iako predstavlja samo 1% poseda lopte u profesionalnim takmičenjima (Tenga et al., 2010). Među mnogim tehničkim i taktičkim aspektima ponašanja igrača, golovi su najviše proučavani. Istina je da je gol ključ uspeha timova (Cachay & Thiel, 2000) te stoga analiza svih utakmica na velikom fudbalskom turniru (Evropsko prvenstvo, Svetsko prvenstvo) omogućuje višestruke ocene.

Alberti i sar. (2013) ukazuju da je značajno veća frekvencija golova zabeležena u drugom poluvremenu, sa najvećom stopom finalnih 15-minutnih perioda igre tokom velikih Evropskih fudbalskih prvenstava.

Povratna informacija jedan je od najvažnijih faktora u poboljšanju performansi fudbalera. Nekad su treneri davali povratne informacije na temelju svojih subjektivnih zapažanja. Subjektivna zapažanja trenera mogu, ali i ne moraju biti tačna, tj. prilično su nepouzdana. To je potvrdilo istraživanje (Hughes & Franks, 2004) kojim je otkriveno da je procenat trenera koji su bili tačni u svojoj proceni nakon utakmice bio manji od 45 posto tokom 45 minuta fudbalske utakmice. To je zato što ljudsko pamćenje ima ograničenja zbog kojih se ne možemo setiti celog događaja tokom utakmice.

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Fudbalska tehnika je veština ili sposobnost igrača da u raznovrsnom, svrsishodnom kretanju i u najsloženijim uslovima može da izvodi jednostavne i racionalne, slobodne i lake, brze, sigurne i efikasne pokrete sa loptom (Aleksić i Janković, 2006). Ukratko pod tehnikom treba podrazumevati efikasnost delovanja fudbalera na terenu.

Taktičko znanje ne samo da olakšava obradu informacija, već omogućava ciljanu i svrsisihodnu adaptaciju potencijalnih reakcija igrača u okolnim i neposrednim uslovima igre (Ali, 2011).

Napad je okosnica fudbalske igre. Osnovni cilj fudbalske igre je pobeda, a do nje se dolazi uz maksimalno korišćenje napada. U savremenoj praksi fudbalske igre u sredstva kojima se sprovodi napad spadaju: brzi napad, kontranapad i kombinovani napad (Savić, 2011).

Cilj ove studije bio je analiza karakteristika postignutih golova na poslednjem Evropskom fudbalskom prvenstvu 2020/2021. godine, i isto tako evaluirati izabrane statističke parametre u toku utakmica na takmičenju. Konkretno, ispitano je srednje vreme postignutih golova u zavisnosti od različitih posmatranih fiksnih faktora. Opšta hipoteza rada jeste da je u drugom poluvremenu postignuto više golova nego u prvom i produžecima. Posebne hipoteze rada jesu da su najzastupljenije vrsta napada bile kontinuirani i brzi napadi, zatim da je najviše bilo desnonogih strelaca, kao i da je prostor unutar 16 metara bio najzastupljeniji prilikom postizanja golova. Isto tako, predpostavlja se da prilikom postavljenih interakcija između različitih varijabli i perioda igre, postignuti golovi dolaze približno na sredini minutnih podela. I poslednja hipoteza bi bila da pobedničke ekipe imaju najbolje statističke parametre na utakmicama.

2. METOD

2.1. Učesnici

Proučavana je 51 utakmica uz učešće 24 reprezentacije (grupna faza i eliminaciona faza takmičenja). Razlog odabira ovog Evropskog fudbalskog prvenstva 2020/2021. bilo je učešće elitnih reprezentacija (Italije, Švajcarske, Turske, Velsa, Danske, Finske, Belgije, Rusije, Austrije, Severne Makedonije, Holandije, Ukrajine, Engleske, Hrvatske, Škotske, Češke, Poljske, Slovačke, Španije, Švedske, Mađarske, Portugalije, Francuske i Nemačke).

2.2. Dizajn i procedure

Evropsko prvenstvo u fudbalu 2020/2021. je šesnaesto po redu prvenstvo (11. jun – 11. jul 2021) koje se održalo u jedanaest zemalja i jedanaest gradova na stadionima Evrope. Fudbalske utakmice na prvenstvu su prenosili Nova S i Sport Klub uz mogućnost ponovnog gledanja i ponovne analize televizijskih snimaka. Istraživanje se temeljilo na personalnom opažanju istraživača koji je beležio karakteristike postignutih golova, što je delom i definisano u Tabeli 1. Neki od statističkih podataka, odmah nakon utakmica, preuzeti su sa stranice EURO Evropsko prvenstvo 2021 kroz opcije: pregled, hronologija, postave, statistika,... Opcija ponovnog gledanja postignutih golova na UEFA-inom službenom YouTube kanalu (UEFA Euro 2020), dala je tačnu procenu postavljenih varijabli.

Tabela 1. *Definicije analiziranih varijabli*

Kontinuirani napadi	Sporiji napad s većim brojem učesnika, kada je odbrana protivnika brojčano nadmoćnija; napad obično počinje sa svoje polovine terena; može značiti i sporiji individualni prodor prema golu protivnika.
Brzi napadi	Brzo izvedeni napad na protivničkoj polovini terena, odmah nakon oduzete lopte; sprovodi se protiv formirane zadnje linije odbrane i neformirane prednje linije odbrane.
Kontranapadi	Najbrži mogući napad sa svoje polovine terena, odmah nakon oduzimanja lopte protivniku; sprovodi se protiv neformirane prednje i zadnje linije odbrane.
Prekidi	Uključuju sve vrste prekida, tj. postizanje golova nakon kornera, nakon direktnog slobodnog udarca, nakon indirektnog slobodnog udarca, nakon jedanaesteraca, nakon odbranjenih jedanaesteraca i nakon ubacivanja lopte u igru s bočne linije tj. nakon auta.

Sredina hrpta stopala	Udarac po lopti na kraćoj, srednjoj ili većoj udaljenosti: pogodak postignut iz neposredne blizine "udarcem iz kolena", ali i s udaljenosti preko 20 metara.
Unutrašnja strana stopala	Udarac lopte izvodi se relativno širokom i ravnom udarnom površinom na kraćim udaljenostima od 2 do 15 metara.
Spoljna strana stopala	Kratki iznenadni udarci lopte u stranu do 10 metara.
Unutrašnja strana hrpta stopala	Lopta se šalje kroz vazduh u lučnoj putanji prilikom postizanja golova ili udarca "efeom" s unutrašnjom stranom stopala po spoljnjoj površini.
Spoljnja strana hrpta stopala	Pravolinijski zalet od 3-4 koraka prema lopti i udarac spoljnjom stranom stopala po unutrašnjoj površini lopte.
Glava	Udarac iz mesta: lopta dolazi u visini igračeve glave; Udarac u kretanju: lopta se kreće malo dalje od igrača, pa je bilo potrebno zaleteti se prema njoj; Udarac odskokom obema nogama: nije bilo moguće uhvatiti zalet prema lopti, jer su protivnički igrači bili u neposrednoj blizini igrača koji je postigao gol; Udarac odskokom jedne noge: igrač je bio u mogućnosti izvesti nešto duži zalet prema lopti prilikom postizanja gola; Udarac bočnim delom glave: igrač je okrenut bočno prema protivničkom golu jer zbog blizine protivnika nije u mogućnosti okrenuti se licem prema golu. Može se izvoditi i u padu; Udarac temenom: igrač je bio leđima okrenut prema golu ili sagračima koji su bili iza njega, pa je loptu koja mu je došla ispred dodao iza sebe.
Posebni udarci	Volej: udarac lopte u vazduhu unutrašnjom stranom stopala ili sredinom hrpta stopala; "Dropkik": udarac se izvodi nakon što lopta dodirne tlo, na sličan način kao volej; Udarac špicem: do lopte se dolazi u zadnjem trenutku pri izvođenju udarca na gol iz neposredne blizine; Udarac đonom; Udarac potkolenicom.
Autogol	Postizanje sopstvenog gola.
Penal	Direktni šut s jedanaest metara.
Prostor 16 metara	Podrazumeva ograničeni prostor unutar 16 metara.
Golmanski prostor	Podrazumeva ograničeni golmanski prostor unutar 5 metara.
Prostor van 16 m	Podrazumeva ograničeni prostor fudbalskog terena van 16 metara.

Deskriptivna opservacija je pomogla kod dobijanja parametara vrste napada, završnih kontakata pri postizanju golova, asimetričnosti, uticaju prvog gola na konačni rezultat, i relevantnih pokazatelja na mečevima. Takođe, metoda analize pomogla je u promatranju odnosa između tri varijable (dve kategorijske nezavisne varijable i jedna kontinuirana zavisna varijabla).

Zavisna varijabla:

- vreme postignutih golova tokom svake utakmice.

Fiksni faktor:

- podela po trajanju igre: od 1 do 15 minuta, od 16 do 30 minuta, od 31 do poluvremena, od 45 do 60 minuta, od 61 do 75 minuta, od 76 do kraja utakmice i produžeci.

Fiksni faktori:

- vrste napada kojima su golovi postignuti tokom turnira: kontinuirani napadi, brzi napadi, kontranapadi i prekidi (set plays),
- način postignutog pogotka: sredina hrpta stopala, unutrašnja strana stopala, spoljnja strana stopala, unutrašnja strana hrpta stopala, spoljna strana hrpta stopala, udarac glavom, posebni udarci, autogol i jedanaesterac, tj.
- prostor iz kojeg je postignut pogodak: prostor 16 metara, golmanski prostor i prostor van 16 metara.

Opservacija fudbalskih utakmica i prenos pokazatelja omogućiće poboljšanje u realizaciji svojih reprezentacija i izvući najnovije informacije i inovacije na najvažnijem Evropskom fudbalskom turniru.

2.3. Statistička analiza

Prvobitno je izvršena deskriptivna opservacija svih posmatranih varijabli, u vidu apsolutne i relativne frekvencije. Istodobnim ispitivanjem učinka svake nezavisne varijable na zavisnu varijablu uz identifikaciju mogućeg efekta njihove interakcije, korišćena je i dvosmerna analiza varijanse između grupa. Nivo značajnosti:

0.05. Intervali pouzdanosti su: 95.0 %. Kada su opaženi značajni učinci, jednosmerna ANOVA pokazala je razlike između srednjih vrednosti zavisne varijable u grupama. U značajnim interakcijama korišćen je Bonferronijev post-hoc test. Obrada svih podataka izvršena je u IBM SPSS Statistics (IBM Corp., Version 26, Armonk, NY, USA).

3. REZULTATI

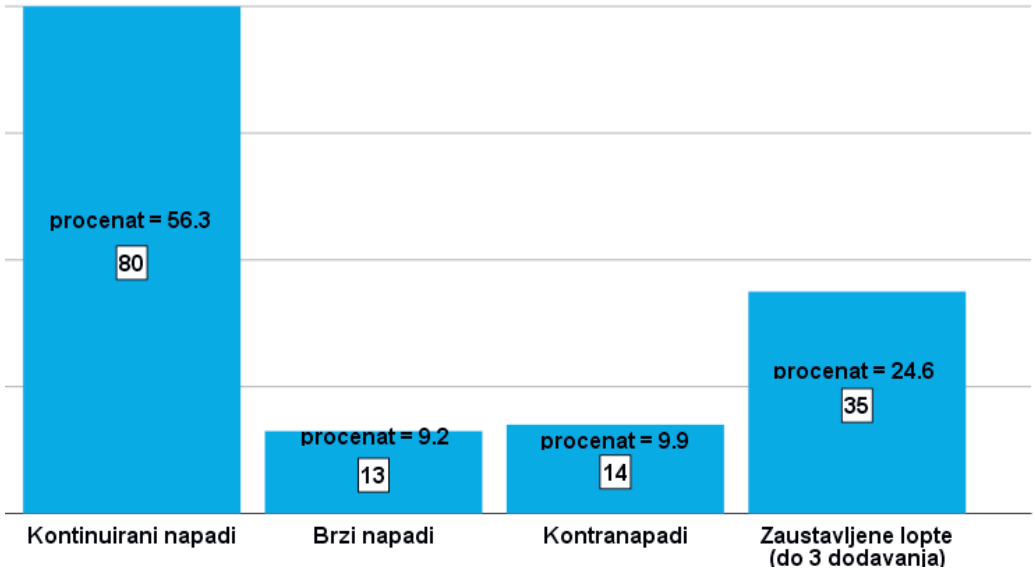
Tokom turnira postignuta su 142 gola (2.79 po utakmici). Analiza postignutih golova (Tabela 2) pokazuje uglavnom slične brojčane vrednosti ili bliže slične brojčane vrednosti, s izuzetkom od 1 do 15, odnosno perioda od 16 do 30 minuta, kao i produžetaka. Apsolutna frekvencija bila je (N = 13) u periodu od 1-15 minuta igre, (N = 16) u periodu od 16-30 minuta, (N = 23) u periodu od 31-45+ minuta, (N = 30) od 45-60 minuta, (N = 24) od 61-75 minuta, (N = 29) od 76-90+ minuta i (N = 7) za periode produžetaka.

Tabela 2. *Deskriptivni parametri postignutih golova*

Vreme postignutih golova (u minutima)	*Broj*	*%*	*Mean*	*Std. Deviation*	*Median*	*Min*	*Max*
0-15 minuta	13	9.2	7.9 (8')	4.8	8.0	2	15
16-30 minuta	16	11.3	24.1 (24')	4.5	25.5	17	30
31-45 minuta	23	16.2	40.4 (40')	5.1	42.0	31	48
45 drugo poluvreme - 60 minuta	30	21.1	53.9 (54')	4.8	54.5	46	60
61-75 minuta	24	16.9	68.3 (68')	4.2	68.0	61	75
76-90 minuta	29	20.4	84.7 (85')	5.6	84.0	77	95
90 produženi - 120 minuta	7	4.9	106.0 (106')	8.8	104.0	95	121
Ukupno	142	100	(55')				

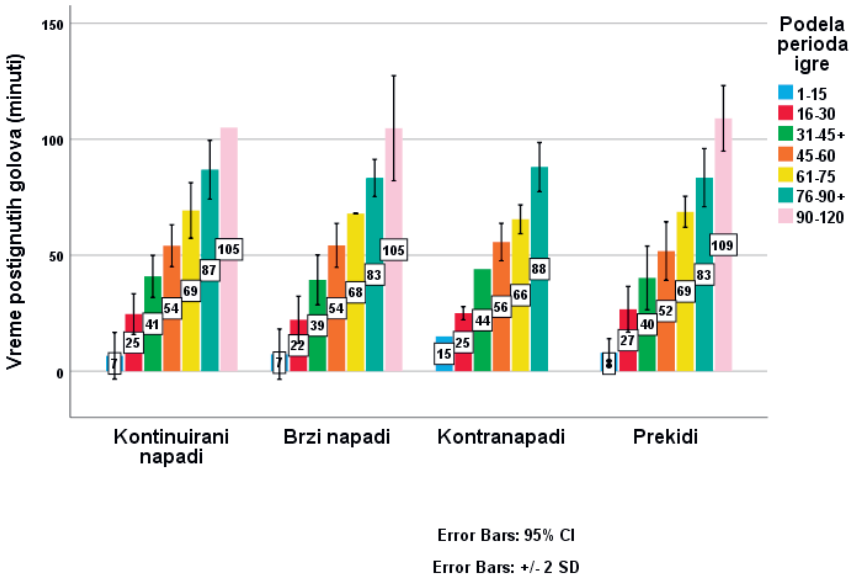
Učestalost primenjivanja vrsta napada pri davanju golova prikazana je na Slici 1. Uočeni rezultati ukazuju da je 80 (56,3%) golova postignuto nakon kontinuiranih napada, 13 (9,2%) nakon brzih napada, 14 (9,9%) golova nakon kontranapada, a preostalih 35 (24,6%) golova postignuto je nakon zaustavljenih lopti.

Slika 1. *Vrste napada prilikom postizanja golova*



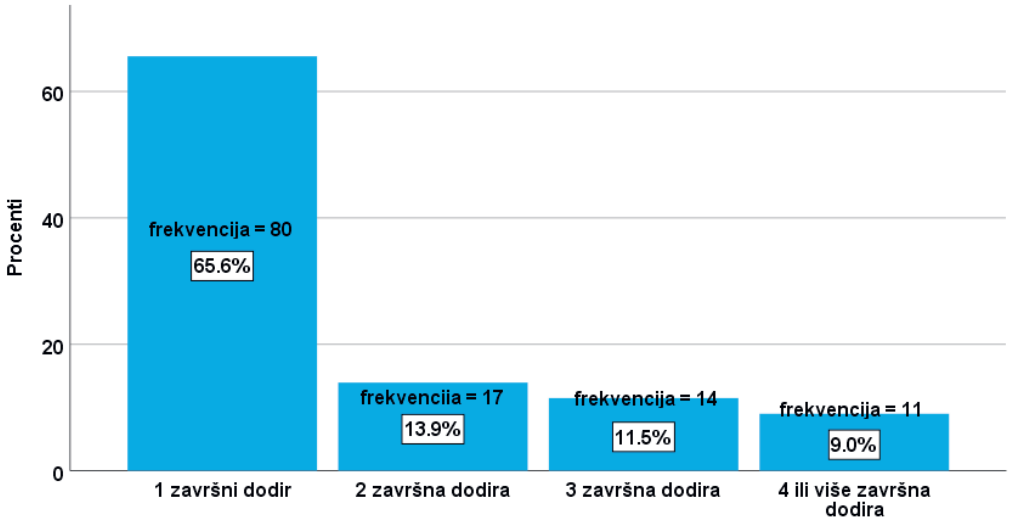
Efekat interakcije (Slika 2) između "podele perioda igre" i "vrste napada" prilikom postizanja golova nije bio statistički značajan (F(16, 142) = 0.947, Sig. = 0.519). Nađen je zasebno statistički značajan glavni efekat "podele perioda igre" (F(6, 142) = 407.359, Sig. = 0.000). Naknadna poređenja korišćenjem jednosmerne ANOVA-e (F(6, 141) = 614.743, Sig. = 0.000) i Bonferronijevog post hoc testa pokazuju srednju vrednost vremena postignutih golova od 1-15 minuta (Mean = 7.9 ili 8.3 minuta, Std. Deviation = 4.8) koja se značajno razlikuje od 16-30 minuta (Mean = 24.1, Std. Deviation = 4.5), zatim od 31-45+ (Mean = 40.4, Std. Deviation = 5.1), od 45-60 (Mean = 53.9 ili 54.3 minuta, Std. Deviation = 4.8), od 61-75 (Mean = 68.3, Std. Deviation = 4.2), od 76-90+ minuta (Mean = 84.7 ili 85.1 minuta, Std. Deviation = 5.6) i od 90-120 minuta (Mean = 106.0, Std. Deviation = 8.8). Glavni zasebni efekat "vrste napada" (F(3, 142) = 1.232, Sig. = 0.301) nije postigao statističku značajnost.

Slika 2. *Vrste napada, prosečno vreme postignutih golova i podela perioda igre*



Slika 3 pokazuje iz koliko dodavanja su postignuti golovi tokom turnira: iz jednog dodavanja je postignuto 80 golova (65,6%), iz dva dodavanja 17 (13,9%), iz tri dodavanja 14 (11,5%) i iz četiri ili više dodavanja postignuto je 11 golova (9,0%).

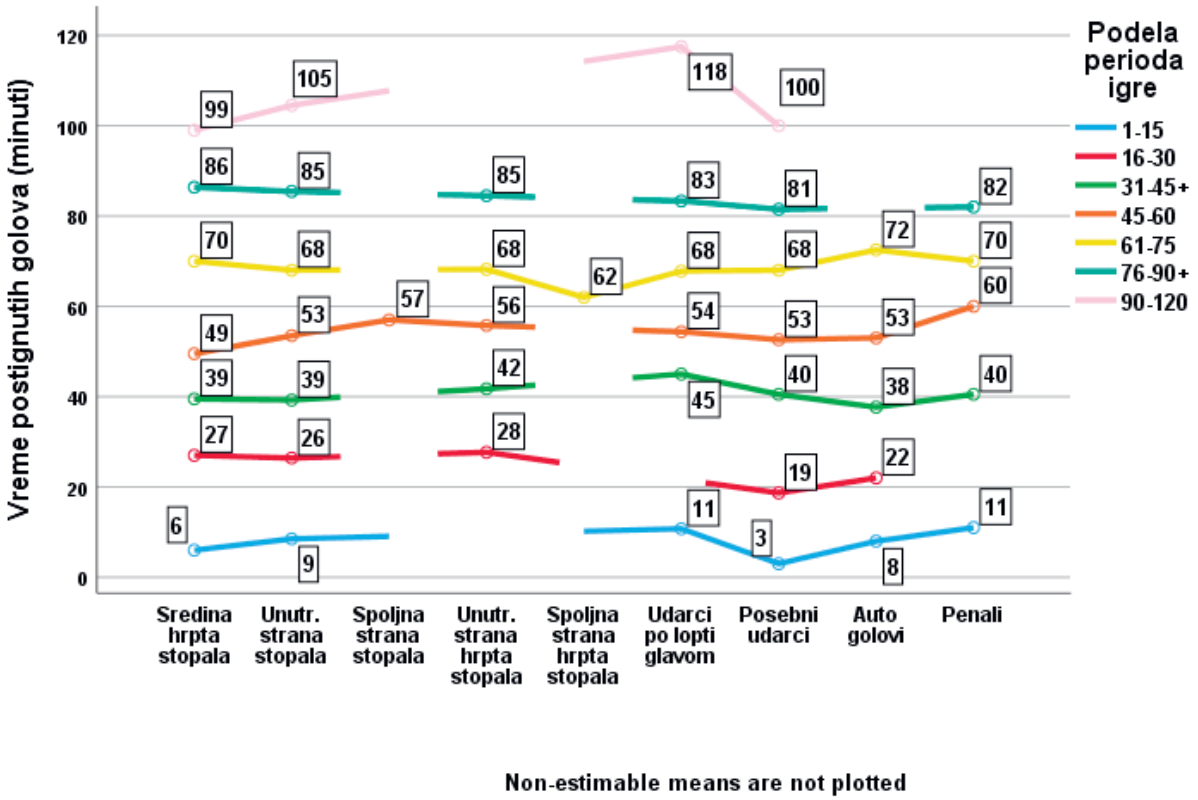
Slika 3. *Prikaz broja završnih kontakata igrača sa loptom prilikom postizanja golova*



Apsolutna frekvencija postignutih golova bila je (N = 21) kod udaraca lopte sredinom hrpta stopala, (N = 37) kod udaraca lopte unutrašnjom stranom stopala, (N = 1) kod udaraca spoljnom stranom stopala, (N = 18) kod udaraca unutrašnjom stranom hrpta stopala, (N = 1) kod udaraca spoljnom stranom hrpta stopala, (N = 27) kod udaraca lopte glavom, (N = 17) za posebne udarce, (N = 11) za autogolove i (N = 9) za jedanaesterce ili penale.

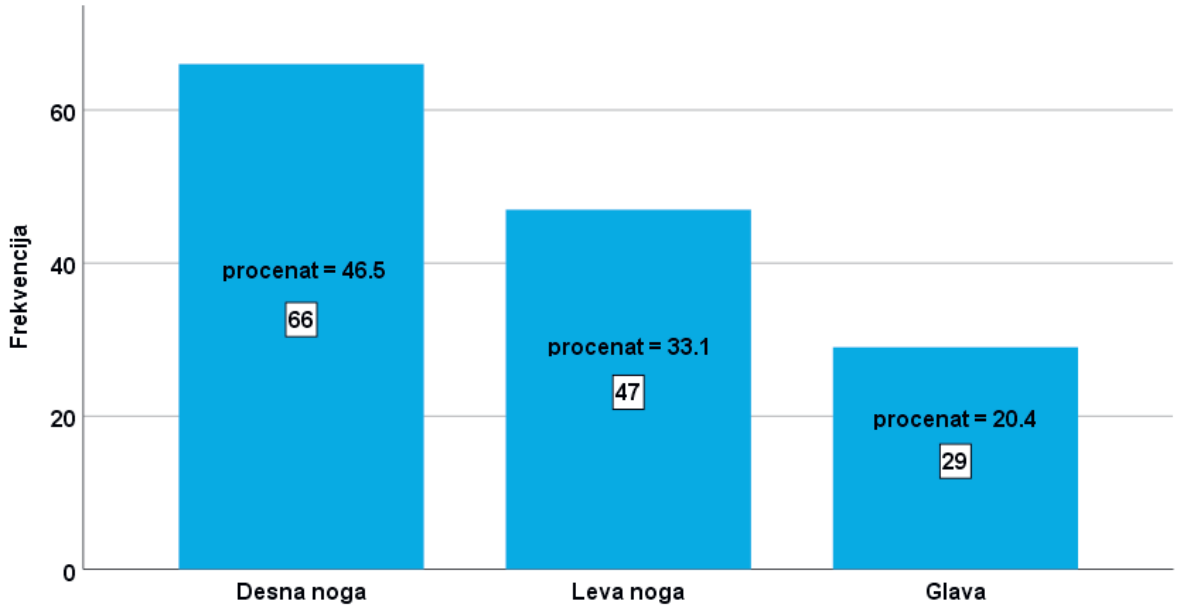
Efekat interakcije (Slika 4) između "podele perioda igre" i "tehničkog načina postignutog gola" nije bio statistički značajan (F(29, 142) = 1.015, Sig. = 0.459). Nađen je statistički značajan glavni efekat "podela perioda igre" (F(6, 142) = 451.452, Sig. = 0.000). Naknadna poređenja korišćenjem jednosmerne analize varijanse (F(6, 141) = 614.743, Sig. = 0.000) i Bonferronijevog post hoc testa, pokazuju iste statistički značajne razlike između srednjih vrednosti rezultata u kategoričkoj nezavisnoj varijabli "podele perioda igre", kao u prvoj opservaciji (Slika 2). Glavni efekat "način postignutih golova" (F(8, 142) = 2.085, Sig. = 0.044) je postigao statističku značajnost. Međutim, naknadna poređenja korišćenjem jednosmerne ANOVA-e (F(8, 141) = 1.197, Sig. = 0.306) i Bonferronijevog post hoc testa pokazuju da srednja vrednost vremena udaraca sredinom hrpta stopala (Mean = 60.1, Std. Deviation = 32.3) nema značajne razlike od udaraca unutrašnjom stranom stopala (Mean = 59.1, Std. Deviation = 25.8), zatim od udaraca spoljnom stranom stopala (Mean = 57.0), unutrašnjom stranom hrpta stopala (Mean = 54.6, Std. Deviation = 18.7), spoljnom stranom hrpta stopala (Mean = 62.0), udaraca glavom (Mean = 60.8, Std. Deviation = 28.5), posebnih udaraca (Mean = 47.4, Std. Deviation = 28.2), autogolova (Mean = 37.0, Std. Deviation = 21.5) i penala (Mean = 51.9, Std. Deviation = 24.1).

Slika 4. *Načini postizanja golova (tehnički elementi - udarci po lopti), prosečno vreme postignutih golova i podela perioda igre*



Slika 5 pokazuje različite načine na koje su golovi postignuti tokom turnira: desnom nogom postignuto je 66 golova (ili 46.5%), levom 47 (ili 33.1%) i glavom 29 (ili 20.4%).

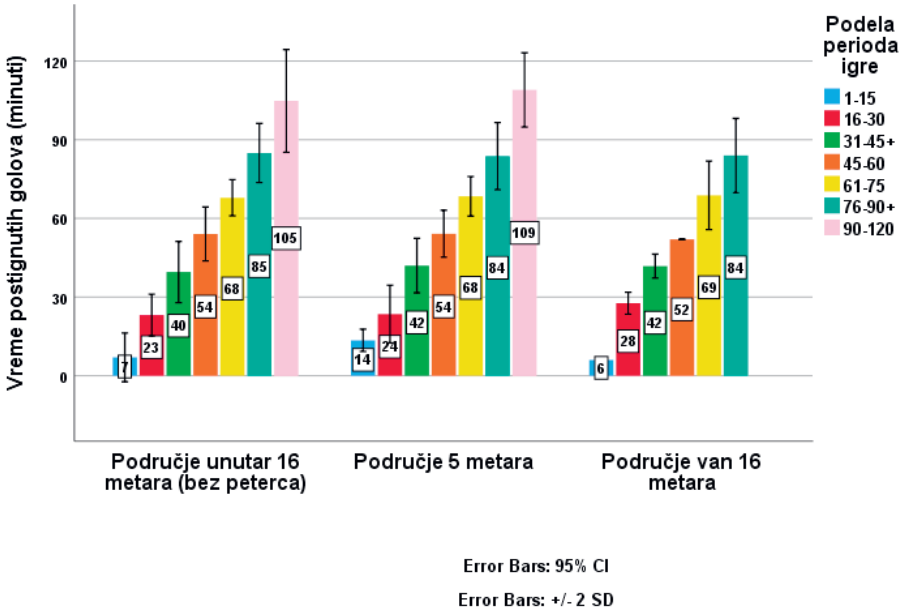
Slika 5. *Frekvencija asimetričnosti postignutih golova (desna - leva noga) kao i golovi postignuti različitim načinima udaraca lopte glavom*



Apsolutna frekvencija postignutih golova bila je (N = 90) unutar 16 metara, (N = 34) unutar golmanskog prostora i (N = 18) izvan 16 metara.

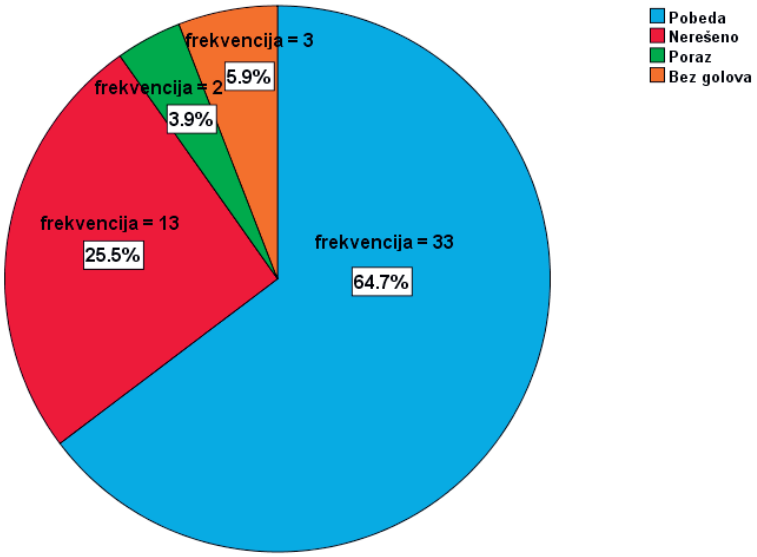
Efekat interakcije (Slika 6) između "podela perioda igre" i "područja materijalizacije" nije bio statistički značajan (F(11, 142) = 0.527, Sig. = 0.882). Nađen je statistički značajan glavni efekat "podela perioda igre" (F(6, 142) = 346.467, Sig. = 0.000). Naknadna poređenja korišćenjem jednosmerne analize varijanse (F(6, 141) = 614.743, Sig. = 0.000) i Bonferronijevog post hoc testa, pokazuju iste statistički značajne razlike između srednjih vrednosti rezultata u kategoričkoj nezavisnoj varijabli "podele perioda igre", kao u prvoj i drugoj opservaciji (Slika 2. i 4). Glavni efekat "područje materijalizacije" (F(2, 142) = 1.146, Sig. = 0.321) nije dosegao statističku značajnost.

Slika 6. *Područja materijalizacije, prosečno vreme postignutih golova, i podela perioda igre*



Slika 7 pokazuje uticaj prvog gola na konačan ishod utakmica tokom turnira: tim koji prvi postigne gol pobedio je u 33 (64,7%) utakmice, završio je nerešeno u 13 (25,5%) utakmica i pretrpeo poraz u 2 (3,9%) utakmice, dok gola nije bilo u 3 (5,9%) utakmice.

Slika 7. *Uticaj prvog postignutog gola na konačni ishod utakmica*



Sasvim je očigledno da su pobedničke ekipe bile prilično dominantne u svojim mečevima (Tabela 3), uzimajući u obzir: ukupni broj šuteva (13,1), šut na gol (5,5), posed lopte (53,6%), dodavanja (517,0), preciznost dodavanja (82,5%), ofsajde (1,8) i udarce iz ugla (5,0).

Tabela 3. *Razlike između timova koji su pobedili, igrali nerešeno i izgubili u statistici mečeva na turniru*

N = 36		*Pobeda*			*Nerešeno*			*Poraz*	
Grupna faza	*Mean*	*Std. Deviation*	*Median*	*Mean*	*Std. Deviation*	*Median*	*Mean*	*Std. Deviation*	*Median*
Ukupno šuteva	13.1	5.7	13.0	10.9	4.4	11.0	10.4	5.9	8.5
Šutevi na gol	5.4	2.6	6.0	3.3	1.8	3.5	2.5	2.0	2.0
Posed lopte (%)	53.6	11.7	55.0	50.0	21.1	50.0	46.4	11.7	45.0
Dodavanja	517.0	125.8	527.5	479.9	210.0	482.5	440.3	106.4	435.5
Preciznost dodavanja (%)	82.5	7.9	84.0	81.3	11.5	84.0	80.7	5.2	81.5
Faulovi	11.3	2.9	11.5	11.6	3.8	11.5	10.8	3.6	10.0
Žuti kartoni	0.9	0.8	1.0	1.7	1.3	1.5	1.6	1.1	2.0
Crveni kartoni	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0
Ofsajdi	1.8	1.5	2.0	1.3	1.1	1.0	1.5	1.2	1.0
Korneri	5.0	2.3	5.0	3.9	3.1	4.0	3.9	3.1	4.0
N = 7		*Pobeda*			*Nerešeno*			*Poraz*	
Eliminaciona faza 90'	*Mean*	*Std. Deviation*	*Median*	*Mean*	*Std. Deviation*	*Median*	*Mean*	*Std. Deviation*	*Median*
Ukupno šuteva	10.6	4.0	11.0	/	/	/	11.7	5.9	10.0
Šutevi na gol	4.9	2.4	5.0	/	/	/	2.7	1.8	3.0
Posed lopte (%)	48.3	4.8	48.0	/	/	/	51.7	4.8	52.0
Dodavanja	464.7	85.5	445.0	/	/	/	488.4	83.1	451.0

Preciznost dodavanja (%)	82.3	6.4	83.0	/	/	/	82.1	5.8	83.0
Faulovi	10.6	3.6	11.0	/	/	/	10.0	3.1	9.0
Žuti kartoni	1.1	1.2	1.0	/	/	/	2.0	1.3	2.0
Crveni kartoni	0.0	0.0	0.0	/	/	/	0.3	0.5	0.0
Ofsajdi	1.3	0.8	1.0	/	/	/	1.9	1.6	2.0
Korneri	4.4	3.0	5.0	/	/	/	4.9	3.2	3.0
N = 8		*Pobeda*			*Nerešeno*			*Poraz*	
Eliminaciona faza 120'	*Mean*	*Std. Deviation*	*Median*	*Mean*	*Std. Deviation*	*Median*	*Mean*	*Std. Deviation*	*Median*
Ukupno šuteva	21.3	5.1	21.5	15.3	8.5	14.0	11.8	4.2	12.5
Šutevi na gol	7.5	3.0	8.0	5.3	2.8	5.0	4.0	2.0	3.0
Posed lopte (%)	58.5	7.0	57.0	50.0	18.9	50.0	41.5	7.0	43.0
Dodavanja	761.0	90.6	746.5	629.5	240.9	578.5	555.3	97.0	577.5
Preciznost dodavanja (%)	87.0	1.4	86.5	82.1	8.1	86.0	81.0	1.4	80.5
Faulovi	9.3	1.5	10.0	15.6	2.8	14.5	20.0	6.4	21.5
Žuti kartoni	1.3	1.0	1.5	2.4	1.5	2.0	2.0	0.8	2.0
Crveni kartoni	0.0	0.0	0.0	0.1	0.4	0.0	0.3	0.5	0.0
Ofsajdi	2.5	1.7	3.0	2.9	2.6	1.5	2.8	2.2	2.0
Korneri	5.0	2.6	5.0	6.3	3.7	5.5	3.8	2.2	4.0

4. DISKUSIJA

Studija, koja je ispitivala obrasce postizanja golova na Euru 2004, pokazala je rezultate (organizovani napad: 44.1 %, kontranapadi: 20.3 % i prekidi: 35.6 %) (Yiannakos & Armatas, 2006). Međutim, Piecniczk (1983) je otkrio da je 27% golova tokom Svetskog prvenstva 1982, postignuto nakon brzog napada, a 28% kroz organizovane napadačke akcije. Dobijeni rezultati ističu važnost uvežbavanja igranja na ofanzivne prekide zbog njihove potencijalne produktivnosti uprkos njihovoj relativno maloj pojavnosti u poređenju s prilikama za otvorenu igru.

Uočena primenjivost različitih udaraca po lopti prilikom postizanja golova je očekivana, s obzirom na raspoloživu površinu stopala prilikom udaraca lopte nogom, a tokom finalnih realizacija. Analizirani parametri raspoloživog prostora (Slika 6) iz kojeg su postignuti golovi mogu se objasniti činjenicom da je prednost u varijabli unutar šesnaesterca razumljiva, s obzirom da igrači u tim situacijama imaju potpunu percepciju gola ispred sebe kao i kraću dužinu leta lopte pri pogotku u odnosu na varijablu izvan šesnaesterca. Svetsko prvenstvo 2010. imalo je 82.07% golova iz šesnaesterca. To je nešto niže od 85.7% za Svetsko prvenstvo 2002 (Njororai, 2004).

5. ZAKLJUČAK

Postavljena opšta hipoteza, kao i niz posebnih hipoteza, potvrđene su ovim radom, izuzev hipoteze sa interakcijama varijabli, koja je delimično potvrđena i isto tako hipoteze statistike na mečevima, u smislu samo grupne faze takmičenja. Prema tome, u situacijskom treningu više pažnje treba posvetiti brzim napadima, i kontranapadima u smislu ukrštanja, utrčavanja u prazan prostor po dubini, odnosno što bržoj realizaciji napada. Vežbanje različitih površina stopala smatra se ključnim uz dodatnu pažnju koja se pridaje unutrašnjoj i spoljnjoj strani stopala pri udarcima. Ipak, vremena postignutih golova različitim načinima udaraca lopte nemaju statističku značajnost, za razliku od izolovanog posnatranja ovih tehničkih elemenata, o čemu govori i procenat zastupljenosti prilikom postizanja golova. Nova aktuelna studija (prosečno vreme postignutih golova) svakako pruža pragmatične informacije o savremenim reperkusijama na najvažnijem turniru evropskog fudbala.

LITERATURA

1. Alberti, G., Iala, F. M., Arcelli, E., Cavaggioni, L., & Rampinini E. (2013). Goal scoring patterns in major European soccer leagues. *Sports Sciences for Health, 9*: 151-153.
2. Aleksić, V., i Janković, A. (2006). *Fudbal: Istorija - Teorija - Metodika*. Fakultet sporta i fizičkog vaspitanja, Univerzitet u Beogradu.
3. Ali, A. (2011). Measuring soccer skill performance: A review. *Scandinavian Journal of Medicine & Science in Sports, 21*(2), 170-183. https://doi.org/10.1111/j.1600-0838.2010.01256.x
4. Cachay, K., & Thiel, A. (2000). *Soziologie des Sports*. München: Juventa-Verlag.
5. Hughes, M., & Franks, I. M. (2004). *Notational analysis of sport. System for better coaching and performance in sport.* Routledge.
6. Njororai, W. W. S. (2004). Analysis of the goals scored at the 17th World Cup Soccer Tournament in South Korea - Japan 2002. *AJPHERD, 10*: 326-332.
7. Piecniczk, A. (1983). Preparation of football teams for Mundial Competition in 1986 [Paper presentation]. *9th UEFA course for National Coaches and Directors of coaching of the Member Associations*, Split, Croatia.
8. Savić, D. (2011). *Vrste napada*. Škola za trenere za sticanje "B" licence. Kragujevac: Fudbalski savez Srbije / UEFA.
9. Tenga, A., Ronglan, L. T., & Bahr, R. (2010). Measuring the effectiveness of offensive match-play in professional soccer. *European Journal of Sport Science, 10*(4), 269-277. https://doi.org/10.1080/17461390903515170
10. UEFA Euro 2020. (2022, June 23). *Watch all 142 goals scored at UEFA EURO 2020!* [Video]. YouTube. https://www.youtube.com/watch?v=JJydBns9ZvM
11. UEFA Euro 2020. (2022, June 23). *Group stage: Report*. https://www.uefa.com/uefaeuro/match/
12. Yiannakos, A., & Armatas, V. (2006). Evaluation of the goal scoring patterns in European Championship in Portugal 2004. I*nternational Journal of Performance Analysis in Sport, 6*(1), 178-188. https://doi.org/10.1080/24748668.2006.11868366

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EUROPEAN FOOTBALL CHAMPIONSHIP 2020/2021: ANALYSIS OF GOALS SCORED AND EVALUATION OF STATISTICALLY PARAMETERS IN MATCHES[1]

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Abstract: The aim of the study was to analyse the characteristics of goals scored in the tournament in terms of a specific way of evaluation. Based on a sample of 51 matches and the participation of 24 national teams, this study is based on the personal observation of the researcher, that is, the analysis was based on watching the matches live via domestic cable channels, as well as on the UEFA official YouTube channel. A two-way analysis of variance between groups was used to process one part of the data. A total of 142 goals were scored. The fixed factor showed the highest prevalence of goals scored in the period of 45-60 minutes (30), while the fixed factors included the types of attacks and the number of goals scored: (80) continuous attacks (mean value = 53.7 minutes), (13) fast attacks (59.5 minutes), (14) counter-attacks (55.7 minutes) and (35) set plays or interruptions (51.8 minutes). One final touch was evaluated (80 or 65.6%), as well as two touches (17 or 13.9%). The highest number of hits (37) was achieved with the inside of the foot (mean value = 53.5 minutes) compared to (27) when hitting the ball with the header (54.4 minutes) and (21) when kicking the ball with the middle part of the foot ridge (49.5 minutes). Most goals were scored with the right foot (66 or 46.5 %), i.e. (90) goals were scored within sixteen meters (outside the box) (54.1 minutes). The first goal provided value (33 or 64.7 %) of the final victory in the match. The obtained results point out to the coaches that they should focus on quick attacks and counter-attacks that consequently lead to scoring goals. Attention must also be paid to more ball strikes with the outside of the foot and the outside part of the foot ridge.

Keywords: *football performance indicators, technical elements, tactical elements, goal, video analysis*

1. INTRODUCTION

Scoring a goal in football is the most important determinant of offensive action success, although it only represents 1 % of ball possessions in professional competitions (Tenga et al., 2010). Among numerous technical and tactical aspects of players' behaviour, goals are studied the most. It is true that a goal is the key of success for teams (Cachay & Thiel, 2000) and therefore its analysis in all matches in a big soccer tournament (European Championship, World cup) allows for multiple assessments.

Alberti et al. (2013) indicate that a significantly higher frequency of goals scored was recorded in the second half, with the highest rate in the final 15-minute periods of the game during major European football championships.

Feedback is one of the most important factors in improving the performance of football players. Coaches used to give feedback based on their subjective observations. Coaches' subjective observations may or may not be accurate, i.e. they are quite unreliable. This was supported by a study (Hughes & Franks, 2004) where it was found

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that the percentage of coaches who were correct in their assessment after the game was less than 45 percent during the 45 minutes of a soccer match. This is because human memory has limitations according to which we cannot remember the entire event during the match.

Football technique is the skill or ability of a player to perform simple and rational, free and easy, fast, safe and efficient movements with the ball in various, purposeful movements and in the most complex conditions (Aleksić & Janković, 2006). In short, technique should be understood as the effectiveness of the soccer player's actions on the pitch.

Tactical knowledge not only facilitates the processing of information, but enables targeted and expedient adaptation of the players' potential reactions in the surrounding and immediate conditions of the game (Ali, 2011).

Attack is the backbone of the football game. The basic goal of the football game is victory, and it is achieved with the maximum use of attack. In the modern practice of the football game, the means by which attack actions are carried out include: quick attack, counter-attack and combined attack (Savić, 2011).

The aim of this study was to analyze the characteristics of goals scored at the last European Football Championship 2020/2021, and also to evaluate the selected statistical parameters during the matches of the competition. In particular, the mean time of scored goals was examined depending on different observed fixed factors. The general hypothesis of the study is that more goals were scored in the second half than in the first and overtime periods. The special hypotheses of the study are that the most represented type of attack actions were continuous and quick attacks, then that there were most right-footed shooters, as well as that the space within 16 meters was the most represented when scoring goals. Likewise, it is assumed that during the set interactions between different variables and game periods, scored goals come approximately in the middle of minute divisions. And the last hypothesis would be that the winning teams have the best statistical parameters in the matches.

2. METHOD

2.1. Subjects

Fifty-one (51) matches were studied with the participation of 24 national teams (group phase and elimination phase of the competition). The reason for choosing the 2020/2021 European Football Championship was the participation of elite national teams (Italy, Switzerland, Turkey, Wales, Denmark, Finland, Belgium, Russia, Austria, North Macedonia, Holland, Ukraine, England, Croatia, Scotland, Czech Republic, Poland, Slovakia, Spain, Sweden, Hungary, Portugal, France and Germany).

2.2. Design and Procedures

The European Football Championship 2020/2021 is the sixteenth championship in a row (June 11 - July 11, 2021), which was held in European stadiums across eleven countries and eleven cities. Football matches at the championship were broadcast by Nova S and Sport Klub with the possibility of re-watching and re-analysing the TV footage. The research was based on the personal observation of the researcher who recorded the characteristics of the scored goals, which is partly defined in Table 1. Some of the statistical data, immediately after the matches, were downloaded from the EURO European Championship 2021 page through the options: overview, chronology, line-ups, statistics... The option to replay the scored goals on UEFA's official YouTube channel (UEFA Euro 2020), provided an accurate assessment of the set variables.

Table 1. *Definitions of analysed variables*

Continuous attacks	A slower attack with a larger number of participants, when the opponent's defence is numerically overwhelming; the attack usually s tarts from the attacker's half of the pitch; it can also mean a slower individual penetration towards the goal.
Quick attacks	A quickly executed attack in the opponent's half of the pitch, immediately after the ball has been taken; it is carried out against a formed last line of defence and unformed front line of defence.
Counter-attacks	The fastest possible attack from the attacker's half of the pitch, executed immediately after the ball has been taken away from the opponent; it is carried out against an unformed front line and last line of defence.

Set plays	It includes all types of set plays, i.e., scoring goals after corner kicks, after a direct free kick, after an indirect free kick, after penalties, after saved penalties, and after a side line throw-in.
Middle part of the foot ridge	A kick at shorter, medium or longer distances: a goal scored from close range by means of a "kick from the knee", but also from a distance of over 20 meters.
Inside of the foot	This kick is performed with a relatively wide and flat hitting surface at shorter distances of 2 to 15 meters.
Outside of the foot	Short sudden kicks to the side up to 10 meters.
Inside part of the foot ridge	The ball is sent through the air in an arching path when scoring goals or kicking with a "spin" with the inner part of the foot on the outer surface of the ball.
Outside part of the foot ridge	A straightforward run-up of 3-4 steps towards the ball and a kick with the outside part of the foot on the inner surface of the ball.
Header	A hit from a standing position: when the ball comes at the height of the player's head; a hitting movement: the ball moves a little further from the player, so it is necessary to run up towards it; a hit by jumping using both legs: it is not possible to run up towards the ball and there are opposing players in immediate vicinity of the player who scored the goal; a hit by jumping using one leg: when a player is able to make a slightly longer run up towards the ball when scoring a goal; a hit with the lateral part of the head: the player is turned sideways towards the opponent's goal due to the close proximity of the opponent, he is unable to face the goal. It can also be performed in a fall; a header performed by the top of the head: when a player has his back turned towards the goal or his teammates who stayed behind him, so he passes behind a high ball that came to him from the front.
Special kicks	Volley: kicking the ball in the air with the inside of the foot, and the middle ridge of the foot; "Dropkick": the shot is made after the ball touches the ground, in a similar way to the volley; Point kicks: the ball is reached at the last moment when taking a shot at the goal from close range; Sole kicks; Lower leg kicks.
Own goal	Scoring an own goal.
Penalty	A direct shot.
Penalty area	It implies a bordered area within 16 m.
Goal area	It implies a bordered goalkeeping area within 5 meters.
Outside penalty area	It includes the bordered area of the football pitch outside 16 meters.

The descriptive observation helped in obtaining the parameters of the type of attack, final contacts when scoring goals, asymmetry, the influence of the first goal on the final result, and relevant indicators in the matches. Also, the analysis method helped in observing the relationship between three variables (two categorical independent variables and one continuous dependent variable).

Dependent variable:

- time of scored goals during each match.

Fixed factor:

- division by game duration: from 1 to 15 minutes, from 16 to 30 minutes, from 31 to half-time, from 45 to 60 minutes, from 61 to 75 minutes, from 76 to the end of the game and extra time.

Fixed factors:

- types of attacks with which goals were scored during the tournament: continuous attacks, quick attacks, counter-attacks and breaks (set plays),
- the way a goal is scored: middle part of the foot ridge, inside of the foot, outside of the foot, inside part of the foot ridge, outside part of the foot ridge, header, special kicks, own goal and penalty, i.e.
- the area from which the goal was scored: the 16-meter area, the goalkeeper's area and the area outside the 16-meter perimeter.

Observation of football matches and transmission of indicators will enable improvement in the performance of national teams and extract the latest information and innovations at the most important European football tournament.

2.3. Statistical Analysis

Initially, a descriptive observation of all variables was carried out, in the form of absolute and relative frequency. Apart from the simultaneous examination of the effect of each independent variable on the dependent vari-

able, while also identifying the possible effect of their interaction, a two-way between-groups analysis of variance was also used. Significance level: 0.05. Relevance intervals: 95.0 %. When significant effects were observed, one-way ANOVA indicated differences between the mean values of the dependent variable in the groups. In significant interactions, Bonferroni's post-hoc test was used. The processing of all data was performed in the IBM SPSS Statistics (IBM Corp., Version 26, Armonk, NY, USA).

3. RESULTS

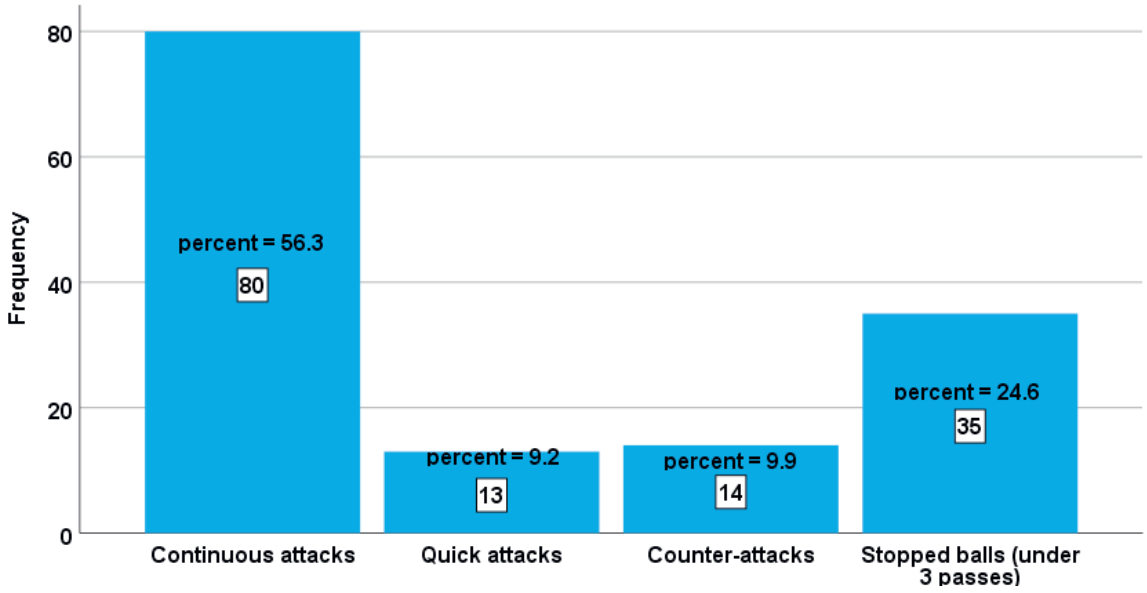
During the tournament, 142 goals were scored (2.79 per match). The analysis of the goals (Table 2) shows mostly similar numerical values or closer similar numerical values, with the exception from 1 to 15 i.e., 16 to 30 minute period as well as extra time periods. The absolute frequency was (N = 13) in the 1-15 minute period of the game, (N = 16) in the 16-30 minute period, (N = 23) in the 31-45+ minute period, (N = 30) in the 45-60 minute, (N = 24) in the 61-75 minute period, (N = 29) in the 76-90+ minute period, and (N = 7) in extra-time periods.

Table 2. *Descriptive parameters of goals scored*

Time of goals scored (in minutes)	*Number*	*%*	*Mean*	*Std. Deviation*	*Median*	*Min*	*Max*
0-15 minutes	13	9.2	7.9 (8')	4.8	8.0	2	15
16-30 minutes	16	11.3	24.1 (24')	4.5	25.5	17	30
31-45 minutes	23	16.2	40.4 (40')	5.1	42.0	31	48
45 second half-60 minutes	30	21.1	53.9 (54')	4.8	54.5	46	60
61-75 minutes	24	16.9	68.3 (68')	4.2	68.0	61	75
76-90 minutes	29	20.4	84.7 (85')	5.6	84.0	77	95
90 extra time-120 minutes	7	4.9	106.0 (106')	8.8	104.0	95	121
Total	142	100	(55')				

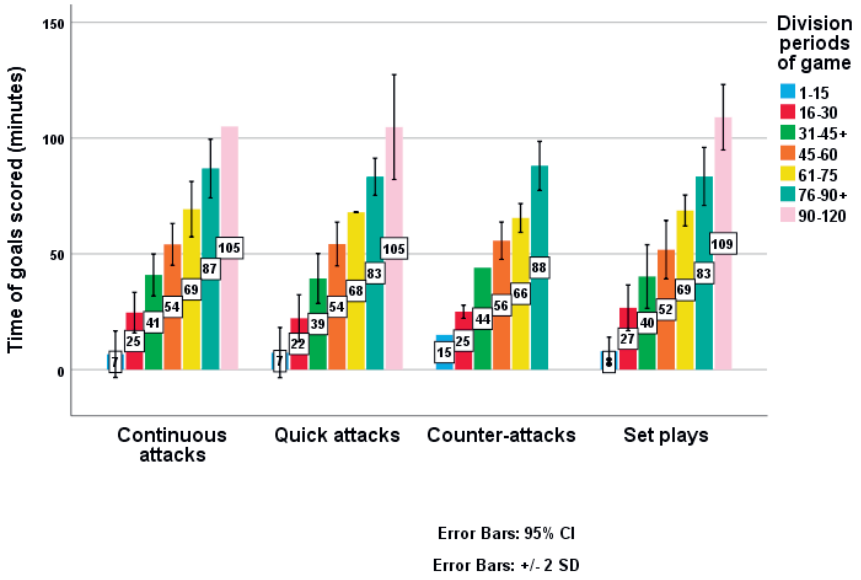
The frequency of the applicability of the types of attacks when scoring goals is presented in Figure 1. The observed results indicate that 80 (56.3%) goals were scored after continuous attacks, 13 (9.2%) after quick attacks, 14 (9.9%) after counter-attacks, and the remaining 35 (24.6%) goals were scored after stopped balls.

Figure 1. *Types of attacks when scoring goals*



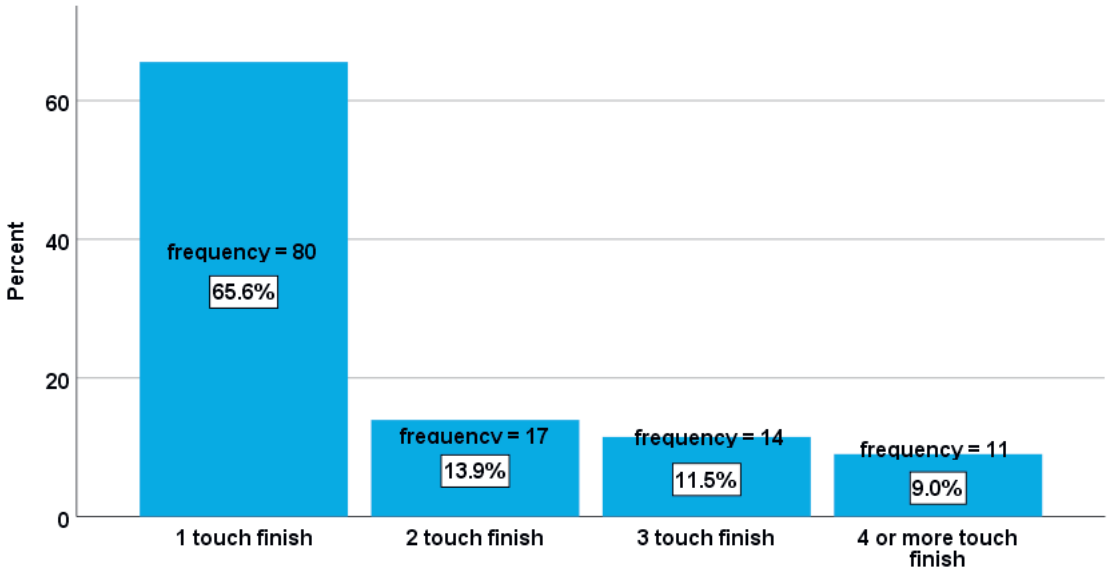
The interaction (Figure 2) effect between "division by periods of the game" and "types of attacks" when scoring goals was not statistically significant (F(16, 142) = 0.947, Sig. = 0.519). A statistically significant main effect of the "division by periods of the game" was found (F(6, 142) = 407.359, Sig. = 0.000). Subsequent comparisons using the one-way ANOVA (F(6, 141) = 614.743, Sig. = 0.000), and Bonferroni's post hoc test show the mean value of 1-15 minute-period (Mean = 7.9 or 8.3 minutes, Std. Deviation = 4.8) significantly different from 16-30 minute-period (Mean = 24.1, Std. Deviation = 4.5), then from the 31-45+ minute-period (Mean = 40.4, Std. Deviation = 5.1), from the 45-60 minute-period (Mean = 53.9 or 54.3 minutes, Std. Deviation = 4.8), from the 61-75 minute-period (Mean = 68.3, Std. Deviation = 4.2), from the 76-90+ minute-period (Mean = 84.7 or 85.1 minutes, Std. Deviation = 5.6) and from the 90-120 minute-period (Mean = 106.0, Std. Deviation = 8.8). The main effect of the "type of attacks" (F(3, 142) = 1.232, Sig. = 0.301) did not achieve statistical significance.

Figure 2. *Types of attacks, average time of goals scored, and division of game periods*



The Figure 3 shows in how many touches the goals were scored during the tournament: one touch finish was observed in 80 goals (65.6%), two touch finish in 17 (13.9%), three touch finish in 14 (11.5%), and four or more touch finish in 11 cases (9.0%).

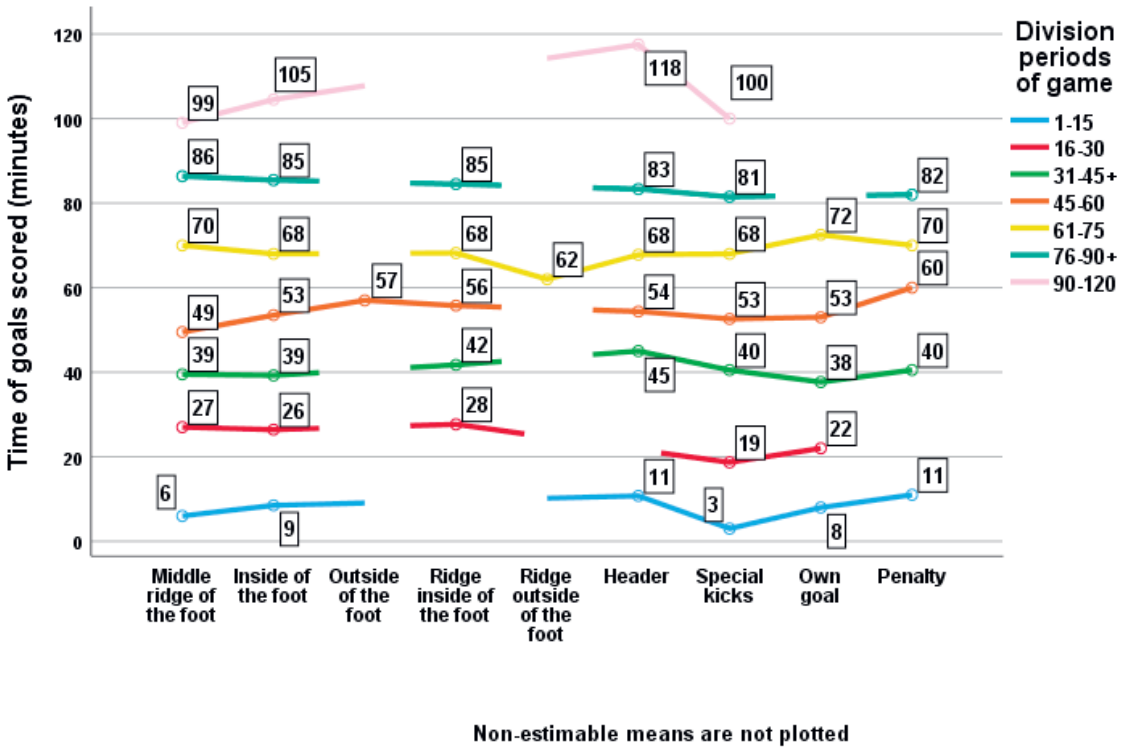
Figure 3. *Display of the number of final contacts of players with the ball when scoring goals*



The absolute frequency of goals scored were (N = 21) for the kicks with the middle ridge of the foot, (N = 37) for the kicks with the inside of the foot, (N = 1) for the kicks using the outside of the foot, (N = 18) for the kicks with the inside part of the foot ridge, (N = 1) for the kicks using the outside part of the foot ridge, (N = 27) for the headers, (N = 17) for the special kicks, (N = 11) for the own goals, and (N = 9) for the penalties.

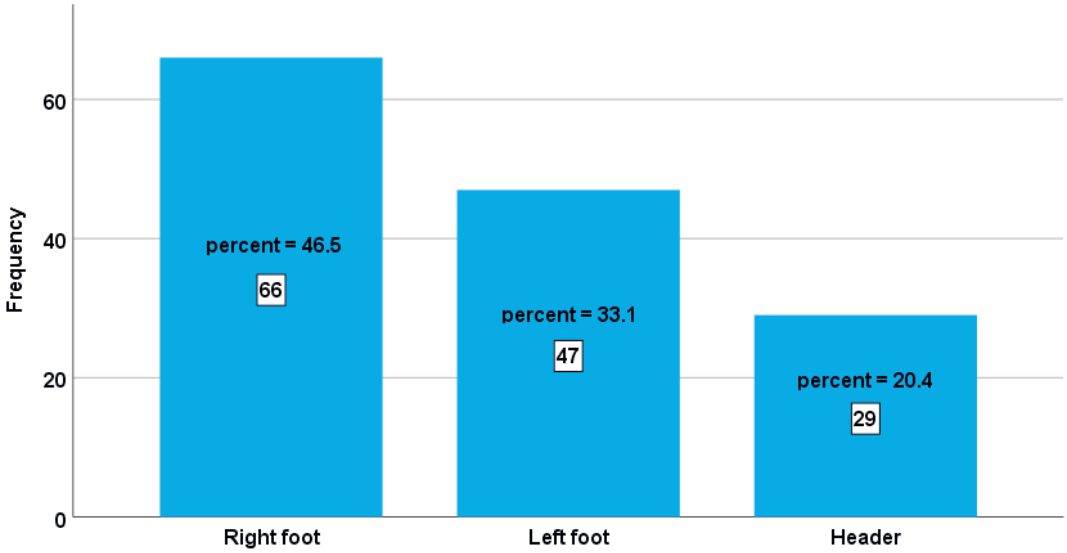
The interaction (Figure 4) effect between the "division by periods of the game" and the "ways of scoring goals" was not statistically significant (F(29, 142) = 1.015, Sig. = 0.459). A statistically significant main effect of the "division by periods of the game" was found (F(6, 142) = 451.452, Sig. = 0.000). Subsequent comparisons using one-way analysis of variance (F(6, 141) = 614.743, Sig. = 0.000), and Bonferroni's post hoc test, show the same statistically significant differences between the mean values of the results in the categorical independent variable the "division by periods of the game", as in the first observation (Figure 2). The main effect of the "ways of scoring goals" (F(8, 142) = 2.085, Sig. = 0.044) did reach statistical significance. However, subsequent comparisons using one-way ANOVA's (F(8, 141) = 1.197, Sig. = 0.306), and Bonferroni's post hoc test show that the mean value of the kicks using the middle ridge of the foot (Mean = 60.1, Std. Deviation = 32.3) had no significant difference from the kicks with the inside of the foot (Mean = 59.1, Std. Deviation = 25.8), and from the kicks with the outside of the foot (Mean = 57.0), the inside part of the foot ridge (Mean = 54.6, Std. Deviation = 18.7), the outside part of the foot ridge (Mean = 62.0), headers (Mean = 60.8, Std. Deviation = 28.5), special kicks (Mean = 47.4, Std. Deviation = 28.2), own goals (Mean = 37.0, Std. Deviation = 21.5), and penalties (Mean = 51.9, Std. Deviation = 24.1).

Figure 4. *Ways of scoring goals (technical elements - kicks per ball), average time of goals scored and division of game periods*



The Figure 5 shows the different ways with goals scored during the tournament: right foot were observed in values (66 or 46.5%), left foot (47 or 33.1%) and header kick (29 or 20.4%).

Figure 5. *Frequency of asymmetry of goals scored (right - left foot) as well as goals scored with different types of headers*



The absolute frequency of goals scored were (N = 90) in the penalty area, (N = 34) for the goal area, and (N = 18) for the outside penalty area.

The interaction (Figure 6) effect between the "division by periods of the game" and "area of materialization" was not statistically significant (F(11, 142) = 0.527, Sig. = 0.882). A statistically significant main effect of the "division by periods of the game" was found (F(6, 142) = 346.467, Sig. = 0.000). Subsequent comparisons using one-way analysis of variance (F(6, 141) = 614.743, Sig. = 0.000), and Bonferroni's post hoc test, show the same statistically significant differences between the mean values of the results in the categorical independent variable – the "division by periods the game", as in the first, and second observations (Figures 2 and 4). The main effect of the "area of materialization" (F(2, 142) = 1.146, Sig. = 0.321) did not reach statistical significance.

Figure 6. *Areas of materialization, average time of goals scored, and division of game periods*

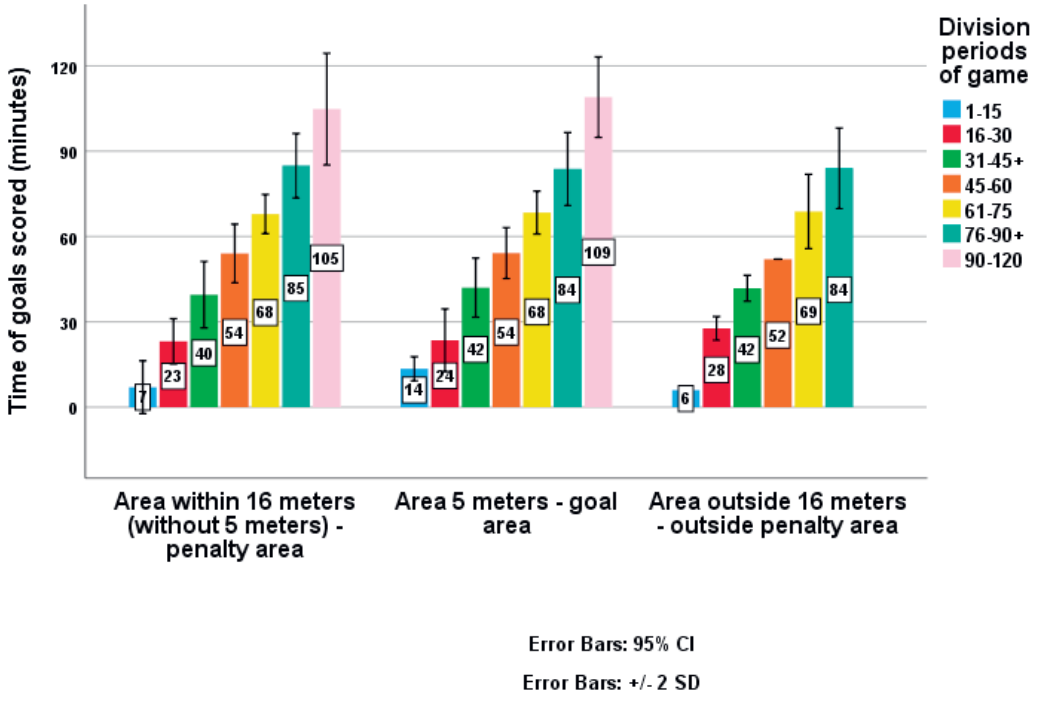
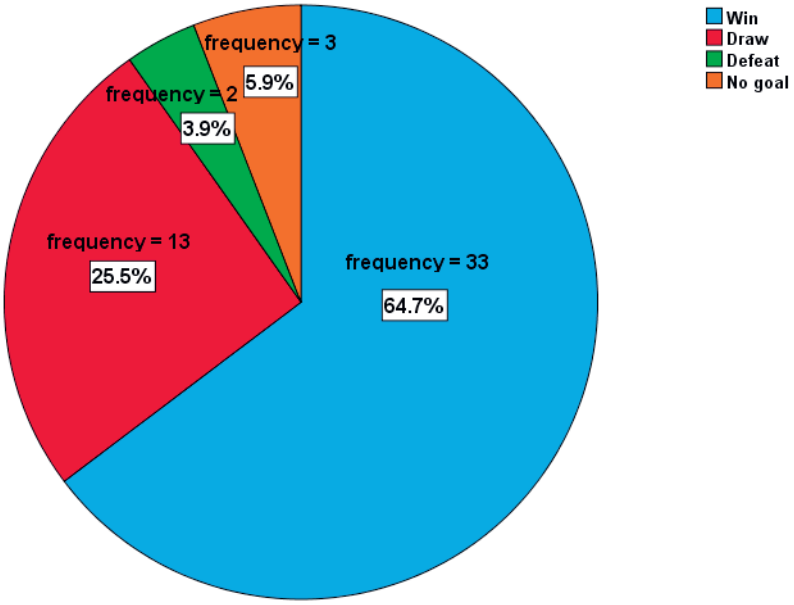


Figure 7 shows the impact of the first goal on the final outcome of the matches during the tournament: the team that scores first won in 33 (64.7%) games, finished with a draw in 13 (25.5%) games, and suffered a defeat in 2 (3.9%) games, whereas there was no goal in 3 (5.9%) games.

Figure 7. *Influence of first goal scored on final outcome of matches*



It is quite obvious that the winning teams were quite dominant in their matches (Table 3), taking into account: total shots (13.1), shots on goal (5.5), ball possession (53.6%), passes (517.0), accuracy of passes (82.5%), offsides (1.8), and corner kicks (5.0).

Table 3. *Differences between teams that won, drew and lost in tournament match statistics*

N = 36		*Winner*			*Drawer*			*Loser*	
Group stage	*Mean*	*Std. Deviation*	*Median*	*Mean*	*Std. Deviation*	*Median*	*Mean*	*Std. Deviation*	*Median*
Total shots	13.1	5.7	13.0	10.9	4.4	11.0	10.4	5.9	8.5
Shots on goal	5.4	2.6	6.0	3.3	1.8	3.5	2.5	2.0	2.0
Ball possession (%)	53.6	11.7	55.0	50.0	21.1	50.0	46.4	11.7	45.0
Passes	517.0	125.8	527.5	479.9	210.0	482.5	440.3	106.4	435.5
Accuracy of passes (%)	82.5	7.9	84.0	81.3	11.5	84.0	80.7	5.2	81.5
Fouls	11.3	2.9	11.5	11.6	3.8	11.5	10.8	3.6	10.0
Yellow cards	0.9	0.8	1.0	1.7	1.3	1.5	1.6	1.1	2.0
Red cards	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0
Offsides	1.8	1.5	2.0	1.3	1.1	1.0	1.5	1.2	1.0
Corner kicks	5.0	2.3	5.0	3.9	3.1	4.0	3.9	3.1	4.0
N = 7		*Winner*			*Drawer*			*Loser*	
Knockout phase 90'	*Mean*	*Std. Deviation*	*Median*	*Mean*	*Std. Deviation*	*Median*	*Mean*	*Std. Deviation*	*Median*
Total shots	10.6	4.0	11.0	/	/	/	11.7	5.9	10.0
Shots on goal	4.9	2.4	5.0	/	/	/	2.7	1.8	3.0
Ball possession (%)	48.3	4.8	48.0	/	/	/	51.7	4.8	52.0
Passes	464.7	85.5	445.0	/	/	/	488.4	83.1	451.0

Accuracy of passes (%)	82.3	6.4	83.0	/	/	/	82.1	5.8	83.0
Fouls	10.6	3.6	11.0	/	/	/	10.0	3.1	9.0
Yellow cards	1.1	1.2	1.0	/	/	/	2.0	1.3	2.0
Red cards	0.0	0.0	0.0	/	/	/	0.3	0.5	0.0
Offsides	1.3	0.8	1.0	/	/	/	1.9	1.6	2.0
Corner kicks	4.4	3.0	5.0	/	/	/	4.9	3.2	3.0
N = 8		*Winner*			*Drawer*			*Loser*	
Knockout phase 120'	*Mean*	*Std. Deviation*	*Median*	*Mean*	*Std. Deviation*	*Median*	*Mean*	*Std. Deviation*	*Median*
Total shots	21.3	5.1	21.5	15.3	8.5	14.0	11.8	4.2	12.5
Shots on goal	7.5	3.0	8.0	5.3	2.8	5.0	4.0	2.0	3.0
Ball possession (%)	58.5	7.0	57.0	50.0	18.9	50.0	41.5	7.0	43.0
Passes	761.0	90.6	746.5	629.5	240.9	578.5	555.3	97.0	577.5
Accuracy of passes (%)	87.0	1.4	86.5	82.1	8.1	86.0	81.0	1.4	80.5
Fouls	9.3	1.5	10.0	15.6	2.8	14.5	20.0	6.4	21.5
Yellow cards	1.3	1.0	1.5	2.4	1.5	2.0	2.0	0.8	2.0
Red cards	0.0	0.0	0.0	0.1	0.4	0.0	0.3	0.5	0.0
Offsides	2.5	1.7	3.0	2.9	2.6	1.5	2.8	2.2	2.0
Corner kicks	5.0	2.6	5.0	6.3	3.7	5.5	3.8	2.2	4.0

4. DISCUSSION

The study, which examined the goal scoring patterns in the Euro 2004 championship showed results (organized offense: 44.1 %, counter attacks: 20.3 %, and set plays: 35.6 %) (Yiannakos & Armatas, 2006). However, Piecniczk (1983) found that 27 % of the goals during the 1982 World Cup Tournament were scored after a quick offense and 28 % through organized offensive actions. Findings provide evidence for the importance of practicing set plays because of their potential productivity despite their relatively low occurrence in comparison to open play opportunities.

The observed applicability of different ball kicks when scoring goals is expected, given the available proportion of foot kick surfaces during final realizations. The analysed parameters of the available area in the football pitch (Figure 6) from which goals were scored can be explained by the fact that the advantage in the variable inside the penalty area is understandable, given that players in these situations have a complete perception the goal in front of them as well as a shorter ball flight length when hitting the target compared to the variable outside the penalty area. The 2010 World Cup tournament saw 82.07 % of the goals being scored from the penalty box. This is slightly lower than the 85.7 % for the 2002 World Cup (Njororai, 2004).

5. CONCLUSION

The proposed general hypothesis, as well as a number of special hypotheses, were confirmed by this paper, except for the hypothesis concerning interactions of variables, which was partially confirmed and likewise the hypothesis on match statistics, only in the group phase of the competition. In situational training, more attention should be paid to quick attacks, and counter-attacks in terms of crossovers, empty space in-depth run-ups, and the fastest possible realization of attacks. Exercising the different surfaces of the foot is considered crucial with extra attention given to kicks using the inside and the outside of the foot. However, the times of goals scored by different ways of kicking the ball do not have statistical significance, in contrast to the isolated observation of these technical elements, which is also indicated by the percentage of representation when scoring goals. A new current study (average time of scored goals) certainly provides pragmatic information about the contemporary repercussions of the most important tournament in European football.

REFERENCES

1. Alberti, G., Iala, F. M., Arcelli, E., Cavaggioni, L., & Rampinini E. (2013). Goal scoring patterns in major European soccer leagues. *Sports Sciences for Health, 9:* 151-153.
2. Aleksić, V., & Janković, A. (2006). *Fudbal: Istorija - Teorija - Metodika*. Fakultet sporta i fizičkog vaspitanja, Univerzitet u Beogradu.
3. Ali, A. (2011). Measuring soccer skill performance: A review. *Scandinavian Journal of Medicine & Science in Sports, 21*(2), 170-183. https://doi.org/10.1111/j.1600-0838.2010.01256.x
4. Cachay, K., & Thiel, A. (2000). *Soziologie des Sports*. München: Juventa-Verlag.
5. Hughes, M., & Franks, I. M. (2004). *Notational analysis of sport. System for better coaching and performance in sport.* Routledge.
6. Njororai, W. W. S. (2004). Analysis of the goals scored at the 17th World Cup Soccer Tournament in South Korea - Japan 2002. *AJPHERD, 10*: 326-332.
7. Piecniczk, A. (1983). Preparation of football teams for Mundial Competition in 1986 [Paper presentation]. *9th UEFA course for National Coaches and Directors of coaching of the Member Associations*, Split, Croatia.
8. Savić, D. (2011). *Vrste napada*. Škola za trenere za sticanje "B" licence. Kragujevac: Fudbalski savez Srbije / UEFA.
9. Tenga, A., Ronglan, L. T., & Bahr, R. (2010). Measuring the effectiveness of offensive match-play in professional soccer. *European Journal of Sport Science, 10*(4), 269-277. https://doi.org/10.1080/17461390903515170
10. UEFA Euro 2020. (2022, June 23). *Watch all 142 goals scored at UEFA EURO 2020!* [Video]. YouTube. https://www.youtube.com/watch?v=JJydBns9ZvM
11. UEFA Euro 2020. (2022, June 23). *Group stage: Report*. https://www.uefa.com/uefaeuro/match/
12. Yiannakos, A., & Armatas, V. (2006). Evaluation of the goal scoring patterns in European Championship in Portugal 2004. *International Journal of Performance Analysis in Sport, 6*(1), 178-188. https://doi.org/10.1080/24748668.2006.11868366