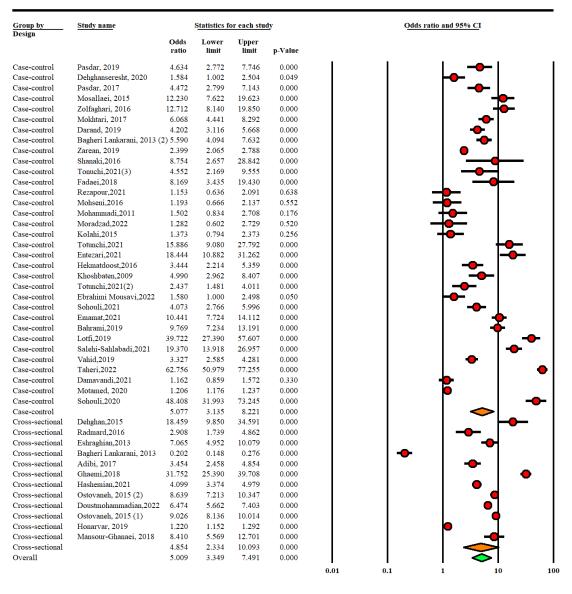
Study name		Statistics for	or each stu	dy		Odds ratio	and 95% CI
	Odds ratio	Lower limit	Upper limit	p-Value			
Adibi, 2017	1.819	1.303	2.538	0.000		1	<b>•</b>
Bagheri Lankarani, 2013	2.521	1.857	3.423	0.000			•
Birjandi, 2016	3.340	2.688	4.150	0.000			
Honarvar, 2019	1.050	1.030	1.070	0.000			
Mansour-Ghanaei, 2018	1.119	0.888	1.411	0.339			<b>b</b>
Motamed, 2016	1.036	1.033	1.040	0.000			
Ostovaneh, 2015 (1)	3.323	3.013	3.666	0.000			
Ostovaneh, 2015 (2)	2.844	2.397	3.375	0.000			
avadkoohi,2002	1.051	0.649	1.702	0.840		-∢	<b>-</b>
Ooustmohammadian,2022	1.463	1.289	1.660	0.000			
Hashemian,2021	0.885	0.734	1.068	0.203			
Mohammadifard,2019	1.363	0.730	2.546	0.331		-   -	<b>├</b>
haemi,2018	77.990	61.174	99.429	0.000			
admard,2016	0.607	0.366	1.007	0.053		-	
Shraghian,2013	3.104	2.194	4.391	0.000			🔷
	2.124	1.794	2.516	0.000			♦
					0.01	0.1	1 10 1
					I	Protective	Risk factor

Appendix1: Forest plot for the relationship between age and nonalcoholic fatty liver



**Protective** 

Risk factor

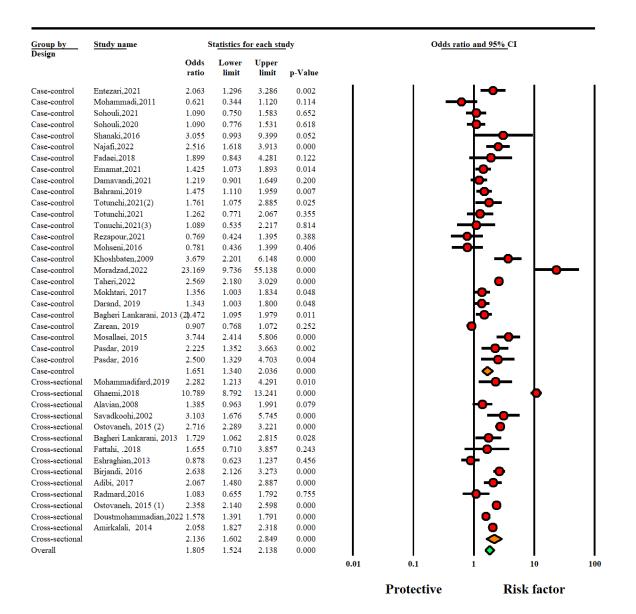
Appendix2: Forest plot for the relationship between body mass index and nonalcoholic fatty liver

Group by	Study name		Statis	tics for eac	ch study			Odds ratio	and 95% CI	
Design		Odds ratio	Lower limit	Upper limit	Z-Value	p-Value				
Case-control	Bagheri Lankarani, 2013 (2	2) 4.702	3.454	6.400	9.839	0.000	- 1	1	•	
Case-control	Dehghanseresht, 2020	2.254	1.421	3.578	3.450	0.001			<del>-    </del>	
Case-control	Ebrahimi Mousavi,2022	2.265	1.427	3.594	3.469	0.001			<del>-                                   </del>	
Case-control	Entezari,2021	4.546	2.813	7.344	6.186	0.000			<del>-</del>	
Case-control	Khoshbaten,2009	1.926	1.166	3.182	2.561	0.010			<del>-</del>	
Case-control	Lotfi,2019	321.302	205.110	503.313	25.207	0.000				>
Case-control	Mohseni,2016	1.811	1.008	3.255	1.985	0.047			<b>├</b>	
Case-control	Salehi-Sahlabadi,2021(2)	13.946	10.102	19.254	16.015	0.000				
Case-control	Taheri,2022	86.947	70.165	107.742	40.811	0.000				
Case-control	Tonuchi,2021(3)	3.351	1.614	6.957	3.245	0.001				
Case-control	Totunchi,2021	8.882	5.200	15.170	7.997	0.000			<b>│</b>	
Case-control	Totunchi,2021(2)	2.091	1.274	3.433	2.918	0.004			<del></del> -	
Case-control		6.812	2.438	19.034	3.660	0.000				
Cross-sectional	Amirkalali, 2014	10.786	9.113	12.766	27.663	0.000			•	
Cross-sectional	Bagheri Lankarani, 2013	3.865	2.731	5.470	7.629	0.000			<del> </del>	
Cross-sectional	Doustmohammadian,2022	0.994	0.876	1.127	-0.098	0.922				
Cross-sectional	Eshraghian,2013	10.375	7.234	14.881	12.714	0.000			<b>│</b> ◆	
Cross-sectional	Ghaemi,2018	28.384	22.747	35.418	29.620	0.000				
Cross-sectional	Hashemian,2021	4.410	3.628	5.361	14.897	0.000				
Cross-sectional	Mansour-Ghanaei, 2018	2.670	2.049	3.479	7.275	0.000				
Cross-sectional	Motamed, 2016	12.903	11.248	14.802	36.512	0.000				
Cross-sectional		6.072	2.500	14.745	3.984	0.000				
Overall		6.377	3.258	12.482	5.407	0.000		[	I <del>≪</del>	I
							0.01	0.1	1 10	10
								Protective	Risk factor	

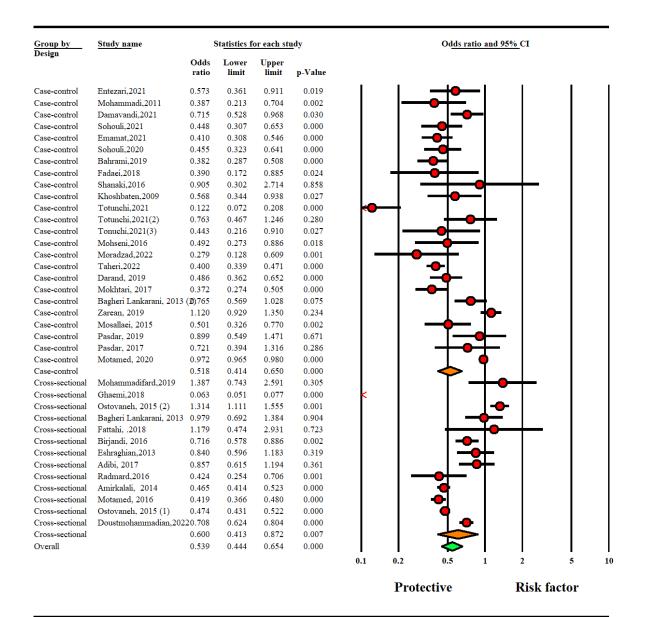
Appendix3: Forest plot for the relationship between waist circumference and nonalcoholic fatty liver

Group by	Study name	$\mathbf{S}_{\mathbf{I}}$	tatistics fo	or each st	udy		Odds ratio	o and 95% CI	
Design		Odds ratio	Lower limit	Upper limit	p-Value				
Case-control	Bagheri Lankarani, 2013 (2)	2.268	1.682	3.059	0.000				
Case-control	Dehghanseresht, 2020	2.062	1.301	3.269	0.002			<del>-</del>	
Case-control	Pasdar, 2016	2.700	1.509	4.830	0.001			<b>-</b>	
Case-control	Pasdar, 2019	3.021	1.826	4.999	0.000			<b>-</b>	
Case-control	Ebrahimi Mousavi,2022	0.163	0.101	0.264	0.000		<b>├</b>		
Case-control	Totunchi,2021	3.920	2.354	6.527	0.000			<b>-</b>	
Case-control	Tonuchi,2021(3)	1.000	0.491	2.036	1.000		-	<del> </del>	
Case-control	Salehi-Sahlabadi,2021(2)	20.553	14.746	28.647	0.000				
Case-control	Lotfi,2019	32.847	22.784	47.354	0.000				<b>)</b>
Case-control	Mohseni,2016	2.477	1.371	4.475	0.003			<b>-</b>	
Case-control	Taheri,2022	6.134	5.167	7.282	0.000				
Case-control		3.134	1.450	6.773	0.004				
Cross-sectional	Birjandi, 2016	6.134	4.912	7.659	0.000				
Cross-sectional	Mansour-Ghanaei, 2018	3.840	2.261	6.522	0.000			<b>│ -</b>	
Cross-sectional	Ostovaneh, 2015 (1)	4.020	3.641	4.438	0.000				
Cross-sectional	Ostovaneh, 2015 (2)	4.242	3.565	5.046	0.000				
Cross-sectional	Radmard,2016	5.367	3.161	9.114	0.000				
Cross-sectional	Eshraghian,2013	6.493	4.556	9.254	0.000			<b>●</b>	
Cross-sectional		4.837	4.014	5.829	0.000			<b>♦</b>	
Overall		4.722	3.939	5.661	0.000			♦	
						0.01	0.1	1 10	100
							Protective	Risk factor	r

Appendix4: Forest plot for the relationship between waist to hip ratio and nonalcoholic fatty liver



Appendix5: Forest plot for the relationship between total cholesterol and nonalcoholic fatty liver



Appendix6: Forest plot for the relationship between high density lipoprotein and nonalcoholic fatty liver

Case-control   Rezapour,2021   0.654   0.360   1.188   0.163   Case-control   Abbasalizad Farhangi,2016   0.633   0.411   0.976   0.038   Case-control   Bagheri Lankarani, 2013 (2)   1.228   0.914   1.650   0.173   Case-control   Damavandi,2021   1.390   1.027   1.881   0.033   Case-control   Damavandi,2021   1.390   1.027   1.881   0.033   Case-control   Damavandi,2021   2.462   1.850   3.278   0.000   Case-control   Emamat,2012   2.462   1.850   3.278   0.000   Case-control   Emamat,2021   2.462   1.850   3.278   0.000   Case-control   Emamat,2021   2.468   1.821   3.346   0.000   Case-control   Khoshbaten,2009   1.933   1.170   3.193   0.010   Case-control   Mokhtari, 2017   2.468   1.821   3.346   0.000   Case-control   Moradzad,2022   1.628   0.759   3.495   0.211   Case-control   Mosallaei, 2015   2.572   1.670   3.962   0.000   Case-control   Mosallaei, 2015   2.572   1.670   3.962   0.000   Case-control   Pasdar, 2019   2.412   1.464   3.975   0.001   Case-control   Shanaki,2016   1.962   0.648   5.940   0.233   Case-control   Shouli,2020   3.643   2.570   5.163   0.000   Case-control   Sohouli,2021   3.262   2.224   4.784   0.000   Case-control   Tomuchi,2021(3)   1.198   0.588   2.440   0.619   Case-control   Tomuchi,2021(3)   1.198   0.588   2.440   0.619   Case-control   Tomuchi,2021(2)   1.326   0.828   2.222   0.226   Case-control   Tomuchi,2021(2)   1.326   0.811   2.168   0.260   Case-control   Tomuchi,2021(3)   1.198   0.588   2.440   0.619   Case-control   Tomuchi,2021(3)   1.198   0.503   0.208   0.000   Cross-sectional   Doustmohammadian,2022	Odds ratio and 95% CI
Case-control   Abbasalizad Farhangi,2016   0.633   0.411   0.976   0.038   Case-control   Balgheri Lankarani, 2013 (2)   1.228   0.914   1.650   0.173   Case-control   Balrami,2019   2.863   2.149   3.814   0.000   Case-control   Damavandi,2021   1.390   1.027   1.881   0.033   Case-control   Damavandi,2021   2.462   1.850   3.278   0.000   Case-control   Emamat,2021   2.462   1.850   3.278   0.000   Case-control   Fadaci,2018   1.594   0.709   3.584   0.259   Case-control   Khoshbaten,2009   1.933   1.170   3.193   0.010   Case-control   Moradzad,2022   1.628   0.759   3.495   0.211   Case-control   Moradzad,2022   1.628   0.759   3.495   0.211   Case-control   Mosallaei, 2015   2.572   1.670   3.962   0.000   Case-control   Motamed, 2020   1.007   1.004   1.010   0.000   Case-control   Motamed, 2020   1.007   1.004   1.010   0.000   Case-control   Sahanki,2016   1.962   0.648   5.940   0.233   Case-control   Sohouli,2020   3.643   2.570   5.163   0.000   Case-control   Sohouli,2021   3.262   2.224   4.784   0.000   Case-control   Taheri,2022   1.298   1.104   1.526   0.002   Case-control   Tomuchi,2021(3)   1.198   0.588   2.440   0.619   Case-control   Totunchi,2021(2)   1.326   0.811   2.168   0.260   Case-control   Totunchi,2021(2)   1.326   0.811   2.168   0.260   Case-control   Totunchi,2021(2)   1.326   0.811   2.168   0.260   Case-control   Vahid,2019   1.217   0.951   1.557   0.119   Case-control   Coss-sectional   Adibi, 2017   1.855   1.329   2.589   0.000   Cross-sectional   Doustmohammadian,2022   1.300   1.146   1.475   0.000   Cross-sectional   Doustmohammadian,2022   1.300   1.146   1.475   0.000   Cross-sectional   Ghaemi,2018   14.189   11.513   17.488   0.000   Cross-sectional   Cotovaneh, 2015(1)   1.855   1.685   2.043   0.000   Cross-sectional   Ostovaneh, 2015(1)   1.855   1.685   2.043   0.000   Cross-sectional   Ostovaneh, 2015(2)   1.633   1.379   1.933   0.000   Cross-sectional   Ostovaneh, 2015(2)   1.633   1.379   1.933   0.000   Cross-sectional   Ostovaneh, 2015(2)   1.633   1.3	
Case-control         Bagheri Lankarani, 2013 (2)         1,228         0.914         1.650         0.173           Case-control         Bahrami, 2019         2,863         2,149         3,814         0,000           Case-control         Damavandi, 2021         1,390         1,027         1,881         0,033           Case-control         Emamat, 2019         2,169         1,616         2,911         0,000           Case-control         Emamat, 2021         2,462         1,850         3,278         0,000           Case-control         Fadaei, 2018         1,594         0,709         3,584         0,259           Case-control         Khoshbaten, 2009         1,933         1,170         3,193         0,010           Case-control         Mokhtari, 2017         2,468         1,821         3,346         0,000           Case-control         Moradzad, 2022         1,628         0,759         3,495         0,211           Case-control         Mosallaei, 2015         2,572         1,670         3,962         0,000           Case-control         Motamed, 2020         1,007         1,004         1,010         0,000           Case-control         Pasdar, 2019         2,412         1,464         3,975	<del>       </del>
Case-control         Baltrami, 2019         2.863         2.149         3.814         0.000           Case-control         Damavandi, 2021         1.390         1.027         1.881         0.033           Case-control         Darand, 2019         2.169         1.616         2.911         0.000           Case-control         Emamat, 2021         2.462         1.850         3.278         0.000           Case-control         Fadaei, 2018         1.594         0.709         3.584         0.259           Case-control         Khoshbaten, 2009         1.933         1.170         3.193         0.010           Case-control         Mokhtari, 2017         2.468         1.821         3.346         0.000           Case-control         Mosallaei, 2015         2.572         1.670         3.962         0.000           Case-control         Mosallaei, 2015         2.572         1.670         3.962         0.000           Case-control         Motamed, 2020         1.007         1.004         1.010         0.000           Case-control         Pasdar, 2019         2.412         1.464         3.975         0.001           Case-control         Sohouli, 2020         3.643         2.570         5.163	<del>                                   </del>
Case-control         Damavandi, 2021         1.390         1.027         1.881         0.033           Case-control         Darand, 2019         2.169         1.616         2.911         0.000           Case-control         Emamat, 2021         2.462         1.850         3.278         0.000           Case-control         Fadaei, 2018         1.594         0.709         3.584         0.259           Case-control         Khoshbaten, 2009         1.933         1.170         3.193         0.010           Case-control         Mokhtari, 2017         2.468         1.821         3.346         0.000           Case-control         Moradzad, 2022         1.628         0.759         3.495         0.211           Case-control         Mosallaei, 2015         2.572         1.670         3.962         0.000           Case-control         Motamed, 2020         1.007         1.004         1.010         0.000           Case-control         Pasdar, 2019         2.412         1.464         3.975         0.001           Case-control         Shanaki, 2016         1.962         0.648         5.940         0.233           Case-control         Sohouli, 2021         3.262         2.224         4.784	<del>    -  </del>
Case-control         Darand, 2019         2.169         1.616         2.911         0.000           Case-control         Emamat, 2021         2.462         1.850         3.278         0.000           Case-control         Fadaei, 2018         1.594         0.709         3.584         0.259           Case-control         Khoshbaten, 2009         1.933         1.170         3.193         0.010           Case-control         Moshlaten, 2017         2.468         1.821         3.346         0.000           Case-control         Moradzad, 2022         1.628         0.759         3.495         0.211           Case-control         Mosallaei, 2015         2.572         1.670         3.962         0.000           Case-control         Motamed, 2020         1.007         1.004         1.010         0.000           Case-control         Pasdar, 2019         2.412         1.464         3.975         0.001           Case-control         Shanaki, 2016         1.962         0.648         5.940         0.233           Case-control         Sohouli, 2020         3.643         2.570         5.163         0.000           Case-control         Taheri, 2022         1.298         1.104         1.526 <t< td=""><td>        </td></t<>	
Case-control         Emamat, 2021         2.462         1.850         3.278         0.000           Case-control         Fadaei, 2018         1.594         0.709         3.584         0.259           Case-control         Khoshbaten, 2009         1.933         1.170         3.193         0.010           Case-control         Mokhtari, 2017         2.468         1.821         3.346         0.000           Case-control         Mosallaei, 2015         2.572         1.670         3.962         0.000           Case-control         Mosallaei, 2015         2.572         1.670         3.962         0.000           Case-control         Motamed, 2020         1.007         1.004         1.010         0.000           Case-control         Pasdar, 2019         2.412         1.464         3.975         0.001           Case-control         Shanaki,2016         1.962         0.648         5.940         0.233           Case-control         Sohouli,2020         3.643         2.570         5.163         0.000           Case-control         Taheri,2022         1.298         1.104         1.526         0.002           Case-control         Totunchi,2021(3)         1.198         0.588         2.440         <	
Case-control         Fadaei,2018         1.594         0.709         3.584         0.259           Case-control         Khoshbaten,2009         1.933         1.170         3.193         0.010           Case-control         Mokhtari, 2017         2.468         1.821         3.346         0.000           Case-control         Moralad,2022         1.628         0.759         3.495         0.211           Case-control         Mosallaei, 2015         2.572         1.670         3.962         0.000           Case-control         Mosallaei, 2019         2.412         1.464         3.975         0.001           Case-control         Pasdar, 2019         2.412         1.464         3.975         0.001           Case-control         Shanaki,2016         1.962         0.648         5.940         0.233           Case-control         Sohouli,2020         3.643         2.570         5.163         0.000           Case-control         Taheri,2022         1.298         1.104         1.526         0.002           Case-control         Tonuchi,2021(3)         1.198         0.588         2.440         0.619           Case-control         Totunchi,2021(2)         1.326         0.811         2.168         <	
Case-control         Khoshbaten,2009         1.933         1.170         3.193         0.010           Case-control         Mokhtari, 2017         2.468         1.821         3.346         0.000           Case-control         Moradzad,2022         1.628         0.759         3.495         0.211           Case-control         Mosallaei, 2015         2.572         1.670         3.962         0.000           Case-control         Motamed, 2020         1.007         1.004         1.010         0.000           Case-control         Pasdar, 2019         2.412         1.464         3.975         0.001           Case-control         Shanaki,2016         1.962         0.648         5.940         0.233           Case-control         Sohouli,2020         3.643         2.570         5.163         0.000           Case-control         Sohouli,2021         3.262         2.224         4.784         0.000           Case-control         Tomuchi,2021(3)         1.198         0.588         2.440         0.619           Case-control         Totunchi,2021(2)         1.356         0.828         2.222         0.226           Case-control         Totunchi,2021(2)         1.356         0.811         2.168	+•-
Case-control         Mokhtari, 2017         2.468         1.821         3.346         0.000           Case-control         Moradzad, 2022         1.628         0.759         3.495         0.211           Case-control         Mosallaei, 2015         2.572         1.670         3.962         0.000           Case-control         Motamed, 2020         1.007         1.004         1.010         0.000           Case-control         Pasdar, 2019         2.412         1.464         3.975         0.001           Case-control         Shanaki,2016         1.962         0.648         5.940         0.233           Case-control         Sohouli,2020         3.643         2.570         5.163         0.000           Case-control         Sohouli,2021         3.262         2.224         4.784         0.000           Case-control         Tohuchi,2021         3.365         0.882         2.440         0.619           Case-control         Totunchi,2021(3)         1.198         0.588         2.440         0.619           Case-control         Totunchi,2021(2)         1.326         0.811         2.168         0.260           Case-control         Valiid,2019         1.217         0.951         1.557 <t< td=""><td>  <del>    •   •  </del>  </td></t<>	<del>    •   •  </del>
Case-control         Moradzad,2022         1.628         0.759         3.495         0.211           Case-control         Mosallaei, 2015         2.572         1.670         3.962         0.000           Case-control         Motamed, 2020         1.007         1.004         1.010         0.000           Case-control         Pasdar, 2019         2.412         1.464         3.975         0.001           Case-control         Shanaki,2016         1.962         0.648         5.940         0.233           Case-control         Sohouli,2020         3.643         2.570         5.163         0.000           Case-control         Sohouli,2021         3.262         2.224         4.784         0.000           Case-control         Taheri,2022         1.298         1.104         1.526         0.002           Case-control         Tomuchi,2021(3)         1.198         0.588         2.440         0.619           Case-control         Totunchi,2021         1.356         0.828         2.222         0.226           Case-control         Totunchi,2021(2)         1.326         0.811         2.168         0.260           Case-control         Vahid,2019         1.217         0.951         1.557         0.1	— —
Case-control         Mosallaei, 2015         2.572         1.670         3.962         0.000           Case-control         Motamed, 2020         1.007         1.004         1.010         0.000           Case-control         Pasdar, 2019         2.412         1.464         3.975         0.001           Case-control         Shanaki,2016         1.962         0.648         5.940         0.233           Case-control         Sohouli,2020         3.643         2.570         5.163         0.000           Case-control         Sohouli,2021         3.262         2.224         4.784         0.000           Case-control         Taheri,2022         1.298         1.104         1.526         0.002           Case-control         Tounchi,2021(3)         1.198         0.588         2.440         0.619           Case-control         Totunchi,2021(2)         1.356         0.828         2.222         0.226           Case-control         Totunchi,2021(2)         1.326         0.811         2.168         0.260           Case-control         Vahid,2019         1.217         0.951         1.557         0.119           Case-control         Vahid,2019         1.217         0.951         1.557         0.1	+•-
Case-control         Motamed, 2020         1.007         1.004         1.010         0.000           Case-control         Pasdar, 2019         2.412         1.464         3.975         0.001           Case-control         Shanaki,2016         1.962         0.648         5.940         0.233           Case-control         Sohouli,2020         3.643         2.570         5.163         0.000           Case-control         Sohouli,2021         3.262         2.224         4.784         0.000           Case-control         Taheri,2022         1.298         1.104         1.526         0.002           Case-control         Tonuchi,2021(3)         1.198         0.588         2.440         0.619           Case-control         Totunchi,2021(2)         1.356         0.828         2.222         0.226           Case-control         Totunchi,2021(2)         1.326         0.811         2.168         0.260           Case-control         Vahid,2019         1.217         0.951         1.557         0.119           Case-control         Vahid,2019         1.217         0.951         1.557         0.119           Cross-sectional         Adibi, 2017         1.855         1.329         2.589         0.00	<del>       </del>
Case-control         Pasdar, 2019         2.412         1.464         3.975         0.001           Case-control         Shanaki,2016         1.962         0.648         5.940         0.233           Case-control         Sohouli,2020         3.643         2.570         5.163         0.000           Case-control         Sohouli,2021         3.262         2.224         4.784         0.000           Case-control         Taheri,2022         1.298         1.104         1.526         0.002           Case-control         Tonuchi,2021(3)         1.198         0.588         2.440         0.619           Case-control         Totunchi,2021         1.356         0.828         2.222         0.226           Case-control         Totunchi,2021(2)         1.326         0.811         2.168         0.260           Case-control         Vahid,2019         1.217         0.951         1.557         0.119           Case-control         Vahid,2019         1.217         0.951         1.557         0.119           Case-control         1.667         1.345         2.067         0.000           Cross-sectional         Bagheri Lankarani, 2013         1.005         0.505         2.002         0.989      <	-+
Case-control         Shanaki,2016         1.962         0.648         5.940         0.233           Case-control         Sohouli,2020         3.643         2.570         5.163         0.000           Case-control         Sohouli,2021         3.262         2.224         4.784         0.000           Case-control         Taheri,2022         1.298         1.104         1.526         0.002           Case-control         Totunchi,2021(3)         1.198         0.588         2.440         0.619           Case-control         Totunchi,2021         1.356         0.828         2.222         0.226           Case-control         Totunchi,2021(2)         1.326         0.811         2.168         0.260           Case-control         Vahid,2019         1.217         0.951         1.557         0.119           Case-control         1.667         1.345         2.067         0.000           Cross-sectional         Adibi, 2017         1.855         1.329         2.589         0.000           Cross-sectional         Bagheri Lankarani, 2013         1.005         0.505         2.002         0.989           Cross-sectional         Doustmohammadian, 2022         1.300         1.146         1.475         0.000 <td></td>	
Case-control         Sohouli,2020         3.643         2.570         5.163         0.000           Case-control         Sohouli,2021         3.262         2.224         4.784         0.000           Case-control         Taheri,2022         1.298         1.104         1.526         0.002           Case-control         Tonuchi,2021(3)         1.198         0.588         2.440         0.619           Case-control         Totunchi,2021(2)         1.356         0.828         2.222         0.226           Case-control         Totunchi,2021(2)         1.326         0.811         2.168         0.260           Case-control         Vahid,2019         1.217         0.951         1.557         0.119           Case-control         1.667         1.345         2.067         0.000           Cross-sectional         Adibi, 2017         1.855         1.329         2.589         0.000           Cross-sectional         Bagheri Lankarani, 2013         1.005         0.505         2.002         0.989           Cross-sectional         Doustmohammadian,2022         1.300         1.146         1.475         0.000           Cross-sectional         Ghaemi,2018         14.189         11.513         17.488         0.	
Case-control         Sohouli,2021         3.262         2.224         4.784         0.000           Case-control         Taheri,2022         1.298         1.104         1.526         0.002           Case-control         Tonuchi,2021(3)         1.198         0.588         2.440         0.619           Case-control         Totunchi,2021(2)         1.356         0.828         2.222         0.226           Case-control         Totunchi,2021(2)         1.326         0.811         2.168         0.260           Case-control         Vahid,2019         1.217         0.951         1.557         0.119           Case-control         1.667         1.345         2.067         0.000           Cross-sectional         Adibi, 2017         1.855         1.329         2.589         0.000           Cross-sectional         Bagheri Lankarani, 2013         1.005         0.505         2.002         0.989           Cross-sectional         Doustmohammadian, 2022         1.300         1.146         1.475         0.000           Cross-sectional         Ghaemi, 2018         14.189         11.513         17.488         0.000           Cross-sectional         Mohammadifard, 2019         1.238         0.663         2.311	
Case-control         Taheri,2022         1.298         1.104         1.526         0.002           Case-control         Tonuchi,2021(3)         1.198         0.588         2.440         0.619           Case-control         Totunchi,2021         1.356         0.828         2.222         0.226           Case-control         Totunchi,2021(2)         1.326         0.811         2.168         0.260           Case-control         Vahid,2019         1.217         0.951         1.557         0.119           Case-control         1.667         1.345         2.067         0.000           Cross-sectional         Adibi, 2017         1.855         1.329         2.589         0.000           Cross-sectional         Bagheri Lankarani, 2013         1.005         0.505         2.002         0.989           Cross-sectional         Doustmohammadian,2022         1.300         1.146         1.475         0.000           Cross-sectional         Ghaemi,2018         14.189         11.513         17.488         0.000           Cross-sectional         Mohammadifard,2019         1.238         0.663         2.311         0.503           Cross-sectional         Ostovaneh, 2015 (1)         1.855         1.685         2.043 <td></td>	
Case-control         Tonuchi,2021(3)         1.198         0.588         2.440         0.619           Case-control         Totunchi,2021         1.356         0.828         2.222         0.226           Case-control         Totunchi,2021(2)         1.326         0.811         2.168         0.260           Case-control         Vahid,2019         1.217         0.951         1.557         0.119           Case-control         1.667         1.345         2.067         0.000           Cross-sectional         Adibi, 2017         1.855         1.329         2.589         0.000           Cross-sectional         Bagheri Lankarani, 2013         1.005         0.505         2.002         0.989           Cross-sectional         Doustmohammadian,2022         1.300         1.146         1.475         0.000           Cross-sectional         Fattahi, 2018         1.640         0.649         4.144         0.296           Cross-sectional         Ghaemi,2018         14.189         11.513         17.488         0.000           Cross-sectional         Ostovaneh, 2015 (1)         1.855         1.685         2.043         0.000           Cross-sectional         Ostovaneh, 2015 (2)         1.633         1.379         1.9	
Case-control         Totunchi,2021         1.356         0.828         2.222         0.226           Case-control         Totunchi,2021(2)         1.326         0.811         2.168         0.260           Case-control         Vahid,2019         1.217         0.951         1.557         0.119           Case-control         1.667         1.345         2.067         0.000           Cross-sectional         Adibi, 2017         1.855         1.329         2.589         0.000           Cross-sectional         Bagheri Lankarani, 2013         1.005         0.505         2.002         0.989           Cross-sectional         Doustmohammadian, 2022         1.300         1.146         1.475         0.000           Cross-sectional         Fattahi, 2018         1.640         0.649         4.144         0.296           Cross-sectional         Ghaemi, 2018         14.189         11.513         17.488         0.000           Cross-sectional         Ostovaneh, 2015 (1)         1.855         1.685         2.043         0.000           Cross-sectional         Ostovaneh, 2015 (2)         1.633         1.379         1.933         0.000           Cross-sectional         Radmard, 2016         0.750         0.453	
Case-control         Totunchi,2021(2)         1.326         0.811         2.168         0.260           Case-control         Vahid,2019         1.217         0.951         1.557         0.119           Case-control         1.667         1.345         2.067         0.000           Cross-sectional         Adibi, 2017         1.855         1.329         2.589         0.000           Cross-sectional         Bagheri Lankarani, 2013         1.005         0.505         2.002         0.989           Cross-sectional         Doustmohammadian,2022         1.300         1.146         1.475         0.000           Cross-sectional         Fattahi, 2018         1.640         0.649         4.144         0.296           Cross-sectional         Ghaemi,2018         14.189         11.513         17.488         0.000           Cross-sectional         Ostovaneh, 2015 (1)         1.855         1.685         2.311         0.503           Cross-sectional         Ostovaneh, 2015 (2)         1.633         1.379         1.933         0.000           Cross-sectional         Radmard,2016         0.750         0.453         1.241         0.263           Cross-sectional         1.802         1.064         3.050         0.028 <td></td>	
Case-control         Vahid,2019         1.217         0.951         1.557         0.119           Case-control         1.667         1.345         2.067         0.000           Cross-sectional         Adibi, 2017         1.855         1.329         2.589         0.000           Cross-sectional         Bagheri Lankarani, 2013         1.005         0.505         2.002         0.989           Cross-sectional         Doustmohammadian, 2022         1.300         1.146         1.475         0.000           Cross-sectional         Fattahi, .2018         1.640         0.649         4.144         0.296           Cross-sectional         Ghaemi, 2018         14.189         11.513         17.488         0.000           Cross-sectional         Mohammadifard, 2019         1.238         0.663         2.311         0.503           Cross-sectional         Ostovaneh, 2015 (1)         1.855         1.685         2.043         0.000           Cross-sectional         Ostovaneh, 2015 (2)         1.633         1.379         1.933         0.000           Cross-sectional         Radmard, 2016         0.750         0.453         1.241         0.263           Cross-sectional         1.802         1.064         3.050 <t< td=""><td> </td></t<>	
Case-control         1.667         1.345         2.067         0.000           Cross-sectional         Adibi, 2017         1.855         1.329         2.589         0.000           Cross-sectional         Bagheri Lankarani, 2013         1.005         0.505         2.002         0.989           Cross-sectional         Doustmohammadian, 2022         1.300         1.146         1.475         0.000           Cross-sectional         Fattahi, .2018         1.640         0.649         4.144         0.296           Cross-sectional         Ghaemi, 2018         14.189         11.513         17.488         0.000           Cross-sectional         Mohammadifard, 2019         1.238         0.663         2.311         0.503           Cross-sectional         Ostovaneh, 2015 (1)         1.855         1.685         2.043         0.000           Cross-sectional         Ostovaneh, 2015 (2)         1.633         1.379         1.933         0.000           Cross-sectional         Radmard, 2016         0.750         0.453         1.241         0.263           Cross-sectional         1.802         1.064         3.050         0.028           Overall         1.686         1.382         2.057         0.000	
Cross-sectional         Adibi, 2017         1.855         1.329         2.589         0.000           Cross-sectional         Bagheri Lankarani, 2013         1.005         0.505         2.002         0.989           Cross-sectional         Doustmohammadian,2022         1.300         1.146         1.475         0.000           Cross-sectional         Fattahi, 2018         1.640         0.649         4.144         0.296           Cross-sectional         Ghaemi,2018         14.189         11.513         17.488         0.000           Cross-sectional         Mohammadifard,2019         1.238         0.663         2.311         0.503           Cross-sectional         Ostovaneh, 2015 (1)         1.855         1.685         2.043         0.000           Cross-sectional         Ostovaneh, 2015 (2)         1.633         1.379         1.933         0.000           Cross-sectional         Radmard,2016         0.750         0.453         1.241         0.263           Cross-sectional         1.802         1.064         3.050         0.028           Overall         1.686         1.382         2.057         0.000	<del> </del>
Cross-sectional         Bagheri Lankarani, 2013         1.005         0.505         2.002         0.989           Cross-sectional         Doustmohammadian, 2022         1.300         1.146         1.475         0.000           Cross-sectional         Fattahi, 2018         1.640         0.649         4.144         0.296           Cross-sectional         Ghaemi, 2018         14.189         11.513         17.488         0.000           Cross-sectional         Mohammadifard, 2019         1.238         0.663         2.311         0.503           Cross-sectional         Ostovaneh, 2015 (1)         1.855         1.685         2.043         0.000           Cross-sectional         Ostovaneh, 2015 (2)         1.633         1.379         1.933         0.000           Cross-sectional         Radmard, 2016         0.750         0.453         1.241         0.263           Cross-sectional         1.802         1.064         3.050         0.028           Overall         1.686         1.382         2.057         0.000	
Cross-sectional         Doustmohammadian,2022         1.300         1.146         1.475         0.000           Cross-sectional         Fattahi, .2018         1.640         0.649         4.144         0.296           Cross-sectional         Ghaemi,2018         14.189         11.513         17.488         0.000           Cross-sectional         Mohammadifard,2019         1.238         0.663         2.311         0.503           Cross-sectional         Ostovaneh, 2015 (1)         1.855         1.685         2.043         0.000           Cross-sectional         Ostovaneh, 2015 (2)         1.633         1.379         1.933         0.000           Cross-sectional         Radmard,2016         0.750         0.453         1.241         0.263           Cross-sectional         1.802         1.064         3.050         0.028           Overall         1.686         1.382         2.057         0.000	——
Cross-sectional         Fattahi, .2018         1.640         0.649         4.144         0.296           Cross-sectional         Ghaemi,2018         14.189         11.513         17.488         0.000           Cross-sectional         Mohammadifard,2019         1.238         0.663         2.311         0.503           Cross-sectional         Ostovaneh, 2015 (1)         1.855         1.685         2.043         0.000           Cross-sectional         Ostovaneh, 2015 (2)         1.633         1.379         1.933         0.000           Cross-sectional         Radmard,2016         0.750         0.453         1.241         0.263           Cross-sectional         1.802         1.064         3.050         0.028           Overall         1.686         1.382         2.057         0.000	
Cross-sectional         Ghaemi,2018         14.189         11.513         17.488         0.000           Cross-sectional         Mohammadifard,2019         1.238         0.663         2.311         0.503           Cross-sectional         Ostovaneh, 2015 (1)         1.855         1.685         2.043         0.000           Cross-sectional         Ostovaneh, 2015 (2)         1.633         1.379         1.933         0.000           Cross-sectional         Radmard,2016         0.750         0.453         1.241         0.263           Cross-sectional         1.802         1.064         3.050         0.028           Overall         1.686         1.382         2.057         0.000	
Cross-sectional         Mohammadifard, 2019         1.238         0.663         2.311         0.503           Cross-sectional         Ostovaneh, 2015 (1)         1.855         1.685         2.043         0.000           Cross-sectional         Ostovaneh, 2015 (2)         1.633         1.379         1.933         0.000           Cross-sectional         Radmard, 2016         0.750         0.453         1.241         0.263           Cross-sectional         1.802         1.064         3.050         0.028           Overall         1.686         1.382         2.057         0.000	<del>                                  </del>
Cross-sectional         Ostovaneh, 2015 (1)         1.855         1.685         2.043         0.000           Cross-sectional         Ostovaneh, 2015 (2)         1.633         1.379         1.933         0.000           Cross-sectional         Radmard,2016         0.750         0.453         1.241         0.263           Cross-sectional         1.802         1.064         3.050         0.028           Overall         1.686         1.382         2.057         0.000	
Cross-sectional         Ostovaneh, 2015 (2)         1.633         1.379         1.933         0.000           Cross-sectional         Radmard,2016         0.750         0.453         1.241         0.263           Cross-sectional         1.802         1.064         3.050         0.028           Overall         1.686         1.382         2.057         0.000	
Cross-sectional         Radmard,2016         0.750         0.453         1.241         0.263           Cross-sectional         1.802         1.064         3.050         0.028           Overall         1.686         1.382         2.057         0.000	
Cross-sectional         1.802         1.064         3.050         0.028           Overall         1.686         1.382         2.057         0.000	•
Overall 1.686 1.382 2.057 0.000	<del>       </del>
•	
•	
	0.2 0.5 1 2 5
	Protective Risk factor

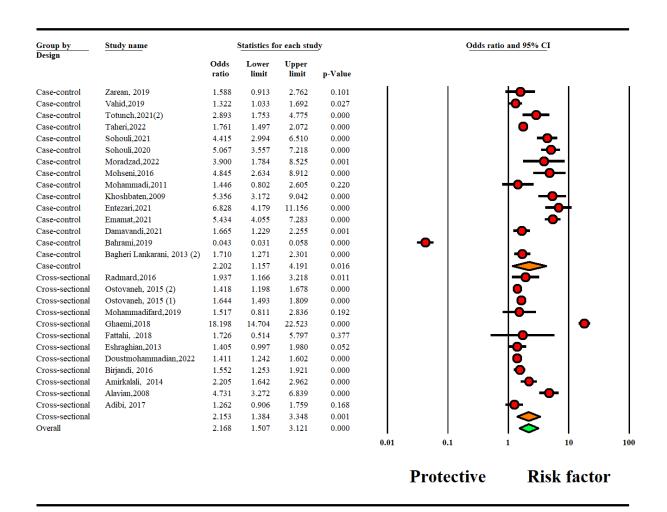
Appendix7: Forest plot for the relationship between low density lipoprotein and nonalcoholic fatty liver

Case-control Case-control Case-control	Motamed, 2020 Pasdar, 2019	Odds ratio	Lower limit	Upper				
Case-control	· · · · · · · · · · · · · · · · · · ·		ши	limit	p-Value			
Case-control	Pasdar 2010	1.005	1.004	1.007	0.000			•
	rasual, 2019	2.378	1.443	3.918	0.001			<del></del>
	Pasdar, 2016	2.600	1.104	6.123	0.029			<del></del>
Case-control	Mokhtari, 2017	2.639	1.946	3.580	0.000			🔸
Case-control	Darand, 2019	1.858	1.385	2.491	0.000			l <del>•</del>
Case-control	Bagheri Lankarani, 2013 (2)	2.729	2.020	3.687	0.000			🔷
Case-control	Vahid,2019	1.325	1.035	1.696	0.026			<b>(●</b>
Case-control	Totunchi,2021(2)	3.661	2.207	6.074	0.000			
Case-control	Taheri,2022	6.506	5.477	7.728	0.000			•
Case-control	Moradzad,2022	6.836	3.064	15.249	0.000			<del></del>
Case-control	Mohammadi,2011	1.107	0.616	1.993	0.733		-	<b>)</b> —
Case-control	Khoshbetan,2009	3.783	2.262	6.327	0.000			
Case-control	Fadaei,2018	2.450	1.081	5.551	0.032			<del></del>
Case-control	Entezari,2021	4.033	2.503	6.498	0.000			
Case-control	Emamat,2021	2.427	1.824	3.230	0.000			🔸
Case-control	Damavandi,2021	1.665	1.229	2.255	0.001			••
Case-control	Bahrami,2019	1.670	1.257	2.219	0.000			<del>•</del>
Case-control		2.447	1.636	3.662	0.000			🔷
Cross-sectional	Savadkoohi,2002	5.129	2.896	9.086	0.000			<del></del>
Cross-sectional	Radmard,2016	2.941	1.759	4.919	0.000			
Cross-sectional	Ostovaneh, 2015 (2)	3.372	2.839	4.005	0.000			•
Cross-sectional	Ostovaneh, 2015 (1)	3.470	3.145	3.828	0.000			•
Cross-sectional	Motamed, 2016	3.483	3.094	3.921	0.000			•
Cross-sectional	Mohammadifard,2019	3.765	1.977	7.168	0.000			
Cross-sectional	Ghaemi,2018	11.231	9.146	13.791	0.000			🐤
Cross-sectional	Eshraghian,2013	1.460	1.036	2.058	0.031			<b>├-</b>
Cross-sectional	Doustmohammadian,2022	2.776	2.442	3.157	0.000			•
Cross-sectional	Birjandi, 2016	5.217	4.184	6.504	0.000			•
Cross-sectional	Bagheri Lankarani, 2013	3.746	2.649	5.298	0.000			🔷
Cross-sectional	Amirkalali, 2014	3.320	2.938	3.752	0.000			•
Cross-sectional	Alavian,2008	2.677	1.858	3.856	0.000			🔷
Cross-sectional	Adibi, 2017	1.816	1.301	2.535	0.000			<del>•</del>
Cross-sectional		3.461	2.814	4.258	0.000			🔷
Overall		3.219	2.678	3.871	0.000		ı	<b> </b>
						0.01	0.1	1 10
							Protective	Risk factor

Appendix8: Forest plot for the relationship between triglyceride and nonalcoholic fatty liver

Group by	Study name		Statistics fo	or each stu	<u>d</u> y		Odds ratio	and 95% CI
Design		Odds ratio	Lower limit	Upper limit	p-Value			
Case-control	Zarean, 2019	2.093	1.595	2.746	0.000			🔸
Case-control	Bagheri Lankarani, 2013 (2)	2.971	2.197	4.017	0.000			🔷
Case-control	Vahid,2019	2.881	2.242	3.703	0.000			🔷
Case-control	Totunchi,2021(2)	5.179	3.094	8.669	0.000			<del>-</del>
Case-control	Taheri,2022	2.916	2.472	3.440	0.000			•
Case-control	Sohouli,2021	53.270	33.246	85.354	0.000			<del>-</del> -
Case-control	Sohouli,2020	55.055	36.220	83.682	0.000			
Case-control	Moradzad,2022	6.238	2.807	13.863	0.000			l <del></del>
Case-control	Mohseni,2016	8.434	4.488	15.848	0.000			
Case-control	Mohammadi,2011	2.173	1.200	3.935	0.010			<b>  —</b>
Case-control	Khoshbaten,2009	6.749	3.968	11.480	0.000			l
Case-control	Entezari,2021	30.773	17.736	53.393	0.000			
Case-control	Damavandi,2021	1.544	1.140	2.090	0.005			l <b>-o</b> -
Case-control	Bahrami,2019	13.558	9.990	18.401	0.000			l
Case-control		6.672	3.790	11.746	0.000			
Cross-sectional	Radmard,2016	3.022	1.806	5.057	0.000			<b>-</b>
Cross-sectional	Ostovaneh, 2015 (2)	2.139	1.805	2.534	0.000			
Cross-sectional	Ostovaneh, 2015 (1)	2.175	1.974	2.395	0.000			🍎
Cross-sectional	Mohammadifard,2019	2.148	1.144	4.035	0.017			<b>⊸</b> ŏ−
Cross-sectional	Ghaemi,2018	22.307	17.958	27.709	0.000			
Cross-sectional	Fattahi, .2018	5.449	2.137	13.893	0.000			<del></del>
Cross-sectional	Eshraghian,2013	2.717	1.922	3.840	0.000			<b></b> -
Cross-sectional	Doustmohammadian,2022	2.428	2.135	2.761	0.000			🎳
Cross-sectional	Birjandi, 2016	1.769	1.428	2.190	0.000			👅
Cross-sectional	Amirkalali, 2014	3.063	2.523	3.719	0.000			👅
Cross-sectional	Alavian,2008	5.483	3.788	7.935	0.000			<b>~-</b> -
Cross-sectional	Adibi, 2017	1.730	1.240	2.413	0.001			l <b></b>
Cross-sectional	,	3.189	2.147	4.739	0.000			<b>~</b>
Overall		4.066	2.940	5.623	0.000			🍝
				020		0.01	0.1	1 10
							Protective	Risk factor

Appendix9: Forest plot for the relationship between alanine aminotransferase and nonalcoholic fatty liver



Appendix10: Forest plot for the relationship between aspartate aminotransferase and nonalcoholic fatty liver

Group by	Study name	$\mathbf{\underline{s}}$	tatistics f	or each st	<u>udy</u>		Ç	Odds ra	tio and 95%	<u>∕6 C</u> I	
Design		Odds ratio	Lower limit	Upper limit	p-Value						
Case-control	Khoshbaten,2009	7.648	3.662	15.973	0.000					+	<del></del>
Case-control	Zarean, 2019	1.952	1.595	2.388	0.000					·	
Case-control	Pasdar, 2017	0.842	0.373	1.901	0.679			+	<del></del>		
Case-control	Pasdar, 2016	1.300	1.078	1.568	0.006				<del>   </del>		
Case-control	Bagheri Lankarani, 2013 (	2)1.723	1.166	2.547	0.006					-	
Case-control	Motamed, 2020	1.018	1.010	1.026	0.000				•		
Case-control		1.641	1.143	2.357	0.007					·	
Cross-sectional	Ostovaneh, 2015 (2)	2.096	1.695	2.591	0.000				•	<b>)</b>	
Cross-sectional	Ostovaneh, 2015 (1)	2.843	2.516	3.213	0.000						
Cross-sectional	Motamed, 2016	2.672	2.384	2.994	0.000						
Cross-sectional	Fattahi, .2018	1.844	1.223	2.780	0.003				<del>-  </del>	-	
Cross-sectional	Eshraghian,2013	2.741	1.558	4.823	0.000				$\perp$	<b>←</b>	
Cross-sectional	Bagheri Lankarani, 2013	2.562	1.763	3.724	0.000				$\perp$	<u> </u>	
Cross-sectional	Amirkalali, 2014	2.805	2.489	3.162	0.000						
Cross-sectional		2.611	2.381	2.864	0.000					<b>♦</b>	
Overall		2.538	2.320	2.776	0.000					<b>♦</b>	
						0.1	0.2	0.5	1 2	5	10
							Prot	ective	Ri	sk factor	

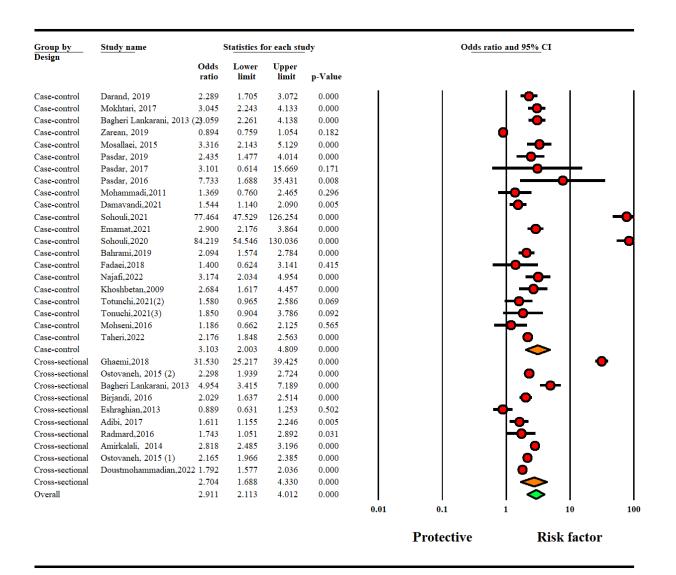
Appendix11: Forest plot for the relationship between hypertension and nonalcoholic fatty liver

Group by	Study name	$\mathbf{S}$	tatistics f	or each st	udy		(	Odds ra	tio and	d 95% (	<b>I</b>	
Design		Odds ratio	Lower limit	Upper limit	p-Value							
Case-control	Hekmatdoost,2016	1.893	1.226	2.922	0.004				-	<del>-</del>	- [	
Case-control	Shanaki,2016	4.100	1.313	12.808	0.015					-	<b>-</b>	$\rightarrow$
Case-control	Khoshbaten,2009	2.263	1.367	3.747	0.001					<del></del>	-	
Case-control	Tonuchi,2021(3)	1.152	0.566	2.346	0.697			-	<del>-</del>	<del></del>		
Case-control	Bagheri Lankarani, 2013 (2	2)1.892	1.405	2.548	0.000					<del>-</del>		
Case-control	Pasdar, 2017	1.050	0.670	1.646	0.832				<del>-</del>	-		
Case-control	Pasdar, 2019	0.946	0.578	1.548	0.826			-	<del>-</del>	-		
Case-control	Dehghanseresht, 2020	1.690	1.068	2.672	0.025				-	<del></del>		
Case-control	Ebrahimi Mousavi,2022	1.522	0.963	2.405	0.072				+	<b>●</b>		
Case-control		1.577	1.263	1.970	0.000				•	$\Diamond$		
Cross-sectional	Ghaemi,2018	1.990	1.650	2.402	0.000					•		
Cross-sectional	Birjandi, 2016	1.737	1.402	2.151	0.000					<del></del>		
Cross-sectional	Eshraghian,2013	4.825	3.397	6.853	0.000						<del>-</del>	.
Cross-sectional	Doustmohammadian,2022	2.145	1.887	2.438	0.000							
Cross-sectional		2.355	1.763	3.146	0.000						.	
Overall		1.830	1.534	2.183	0.000					$\Diamond$		
						0.1	0.2	0.5	1	2	5	1
							Prot	ective		Risk	factor	

Appendix12: Forest plot for the relationship between systolic blood pressure and nonalcoholic fatty liver

Group by	Study name	S	tatistics fo	or each st	<u>ıdy</u>		(	Odds ra	tio and	1 95% C	<u>I</u>
Design		Odds ratio	Lower limit	Upper limit	p-Value						
Case-control	Bagheri Lankarani, 2013 (2)	1.897	1.409	2.554	0.000					<del>-</del>	
Case-control	Zarean, 2019	1.218	1.000	1.485	0.050				le	-	
Case-control	Pasdar, 2019	0.902	0.551	1.476	0.682			_	<u> </u>	-	
Case-control	Dehghanseresht, 2020	1.387	0.878	2.191	0.160				+	<del>-</del>	
Case-control	Fadaei,2018	2.424	1.070	5.491	0.034				_	<del>-</del>	<b>—</b>
Case-control	Hekmatdoost,2016	1.446	0.939	2.228	0.094				$\vdash$	<b>-</b>	
Case-control	Shanaki,2016	3.300	1.069	10.192	0.038				-		lacksquare
Case-control	Khoshbaten,2009	2.926	1.759	4.865	0.000					+-	<u> </u>
Case-control	Tonuchi,2021(3)	1.171	0.575	2.384	0.664			-	<del>-</del>	<b>→</b> ¯	
Case-control	Ebrahimi Mousavi,2022	1.387	0.878	2.191	0.161				+	<b>-</b>	
Case-control		1.540	1.235	1.918	0.000						
Cross-sectional	Ghaemi,2018	5.892	4.840	7.174	0.000					<b>~</b>	į.
Cross-sectional	Birjandi, 2016	2.646	2.133	3.283	0.000					<del>-</del>	-  `
Cross-sectional	Eshraghian,2013	4.520	3.184	6.416	0.000						_
Cross-sectional	Doustmohammadian,2022	2.440	2.145	2.775	0.000						٦
Cross-sectional		3.595	2.278	5.673	0.000						$\bigcirc$
Overall		1.807	1.482	2.203	0.000						
						0.1	0.2	0.5	1	2	5
						U.1	U.2	0.5	1	4	3
							Prot	ective		Risk	factor

Appendix13: Forest plot for the relationship between diastolic blood pressure and nonalcoholic fatty liver



Appendix14: Forest plot for the relationship between fasting blood sugar and nonalcoholic fatty liver

Study name	_1	Statistics fo	or each stu	<u>dy</u>	Odds ratio and 95% CI
	Odds ratio	Lower limit	Upper limit	p-Value	
Motamed, 2020	1.274	1.195	1.359	0.000	
Ostovaneh, 2015 (2)	2.089	1.763	2.475	0.000	
Ostovaneh, 2015 (1)	2.478	2.249	2.731	0.000	
Motamed, 2016	1.398	1.350	1.448	0.000	
Amirkalali, 2014	3.276	2.787	3.851	0.000	
	1.962	1.482	2.598	0.000	
					0.1 0.2 0.5 1 2 5 10
					Protective Risk factor

Appendix15: Forest plot for the relationship between homeostasis model assessment-estimated insulin resistance and nonalcoholic fatty liver

Group by	Study name	S	tatistics f	or each s	<u>tud</u> y		Odds ra	tio and 95	<u>% C</u> I	
Design		Odds ratio	Lower limit	Upper limit	p-Value					
Case-control	Zarean, 2019	2.610	2.030	3.354	0.000					
Case-control	Mosallaei, 2015	4.311	1.894	9.811	0.000			-   -	<b>-</b>	
Case-control	Mokhtari, 2017	2.501	1.513	4.133	0.000				.	
Case-control	Bagheri Lankarani, 2013 (2)	3.784	2.454	5.835	0.000				<b>)</b> -	
Case-control	Vahid,2019	2.629	1.689	4.093	0.000			-   -	.	
Case-control	Khoshbaten,2009	9.075	2.622	31.414	0.000			-	<del>-</del>	-
Case-control	Hekmatdoost,2016	14.408	5.769	35.983	0.000				<del></del>	-
Case-control	Emamat,2021	2.706	1.694	4.325	0.000				-	
Case-control	Damavandi,2021	2.650	1.641	4.281	0.000			-	-	
Case-control	Bahrami,2019	2.654	1.663	4.235	0.000				-	
Case-control		3.192	2.529	4.029	0.000				•	
Cross-sectional	Ostovaneh, 2015 (2)	5.560	3.858	8.012	0.000				<b>→</b>	
Cross-sectional	Ostovaneh, 2015 (1)	1.461	1.273	1.677	0.000					
Cross-sectional	Fattahi, .2018	2.433	1.106	5.350	0.027			<b>—</b>	-	
Cross-sectional	Eshraghian,2013	1.973	1.082	3.597	0.027			<b>-</b>		
Cross-sectional	Doustmohammadian,2022	2.440	1.994	2.985	0.000					
Cross-sectional		2.478	1.526	4.024	0.000				.	
Overall		3.044	2.468	3.755	0.000		1	<b>♦</b>		
						0.01	0.1	1	10	10
							Protective	R	lisk facto	r

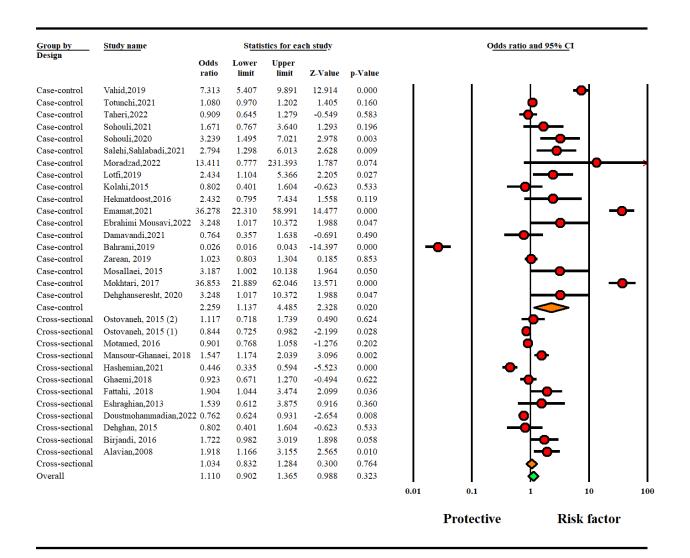
Appendix16: Forest plot for the relationship between diabetes mellitus and nonalcoholic fatty liver

Group by	Study name	S	tatistics f	or each st	udy		(	Odds ra	tio and	195%	<u>C</u> I	
Design		Odds ratio	Lower limit	Upper limit	p-Value							
Case-Control	Zarean, 2019	1.404	1.180	1.670	0.000				(			
Case-Control	Pasdar, 2019	2.782	1.580	4.899	0.000					+	$\vdash$	
Case-Control	Pasdar, 2017	3.841	1.664	8.865	0.002					+	<del></del>	-
Case-Control	Bagheri Lankarani, 2013 (2	2)2.943	1.936	4.473	0.000					$\vdash$	<b>-</b>	
Case-Control		2.415	1.421	4.105	0.001						<b>&gt;</b>	
Cross-sectional	Ostovaneh, 2015 (2)	2.481	0.953	6.460	0.063				+	-	+	
Cross-sectional	Ostovaneh,2015(1)	6.004	5.298	6.805	0.000							)
Cross-sectional	Eshraghian,2013	3.233	2.082	5.019	0.000					_  →	lacktriangle	
Cross-sectional	Doustmohammadian,2022	5.039	4.244	5.983	0.000							
Cross-sectional	Bagheri Lankarani, 2013	2.184	1.544	3.089	0.000					<del></del>	-	
Cross-sectional	Amirkalali, 2014	4.328	3.598	5.206	0.000							
Cross-sectional		3.965	3.007	5.228	0.000						$\Diamond$	
Overall		3.566	2.790	4.557	0.000					•	$\Diamond$	
						0.1	0.2	0.5	1	2	5	10
							Prot	ective		Risk	factor	

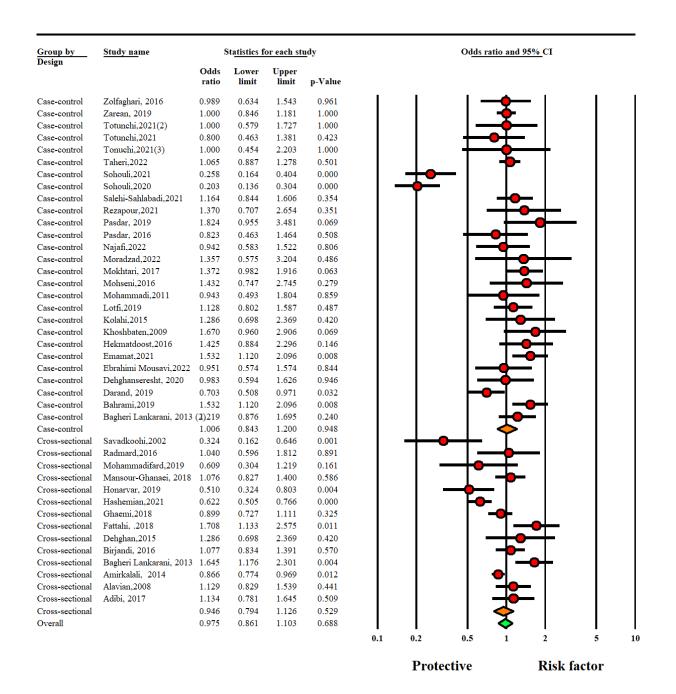
Appendix17: Funnel plot for the relationship between metabolic syndrome and nonalcoholic fatty liver

Study name	5	Statistics f	or each stu	ıdy	Odds ratio and 95% CI
	Odds ratio	Lower limit	Upper limit	p-Value	
Mokhtari, 2017	0.218	0.160	0.297	0.000	
Darand, 2019	0.268	0.199	0.362	0.000	
Tonuchi,2022(3)	0.306	0.148	0.635	0.001	+•+
Taheri,2022	0.574	0.488	0.675	0.000	
Sohouli,2021	0.425	0.291	0.621	0.000	
Sohouli,2020	0.424	0.301	0.598	0.000	
Salahi-Sahlabadi,2021	0.367	0.273	0.493	0.000	
Lotfi,2019	0.261	0.190	0.359	0.000	
Emamat,2021	0.156	0.116	0.209	0.000	
Ebrahimi Mousavi,2022	0.626	0.396	0.990	0.045	
Bahrami,2019	0.267	0.200	0.356	0.000	
	0.326	0.246	0.433	0.000	
					0.1 0.2 0.5 1 2 5 10
					Protective Risk factor

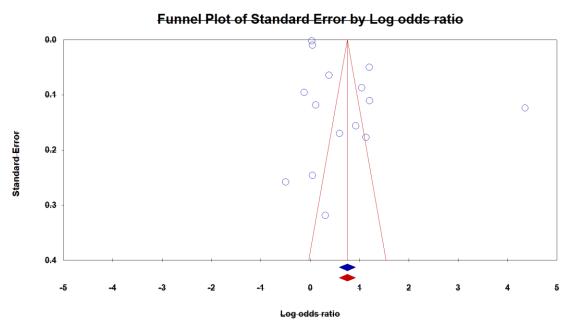
Appendix18: Forest plot for the relationship between physical activity and nonalcoholic fatty liver



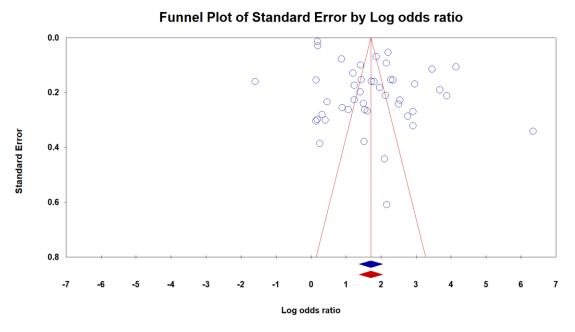
Appendix19: Forest plot for the relationship between smoking and nonalcoholic fatty liver



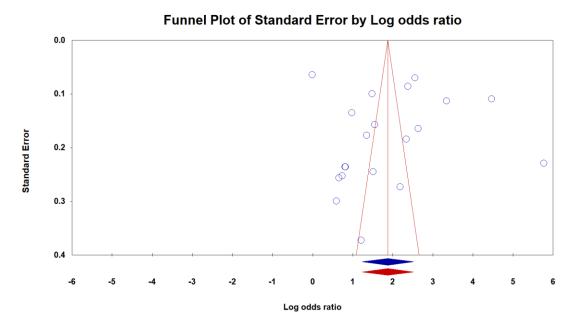
## Appendix20: Forest plot for the relationship between gender and nonalcoholic fatty liver



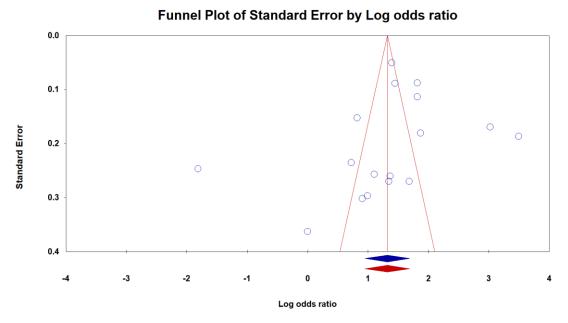
Appendix21: Funnel plot for the relationship between age and nonalcoholic fatty liver



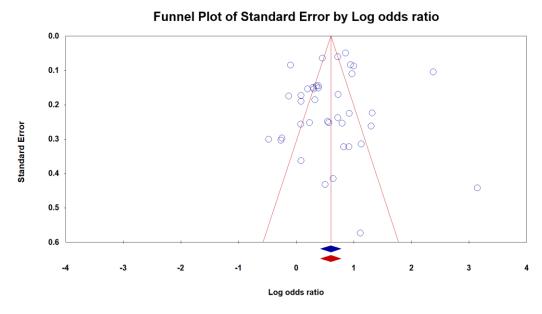
Appendix22: Funnel plot for the relationship between body mass index and nonalcoholic fatty liver



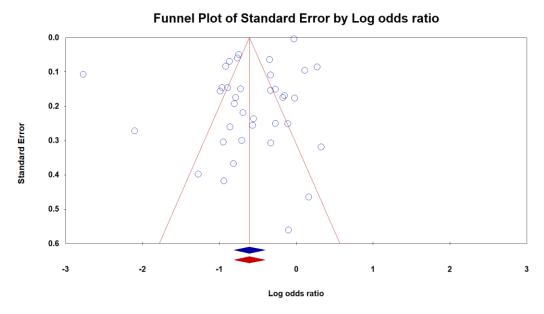
Appendix23: Funnel plot for the relationship between waist circumference and nonalcoholic fatty liver



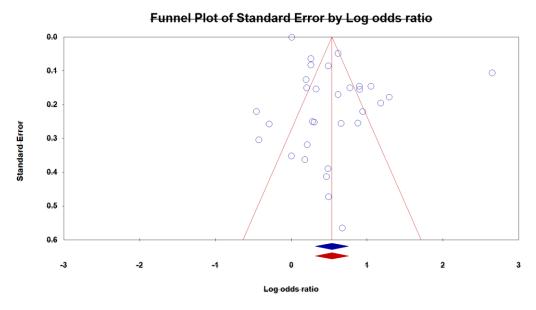
Appendix24: Funnel plot for the relationship between waist to hip ratio and nonalcoholic fatty liver



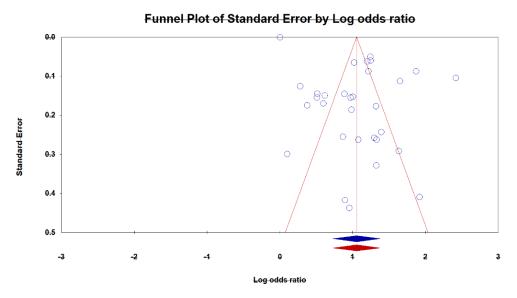
Appendix25: Funnel plot for the relationship between total cholesterol and nonalcoholic fatty liver



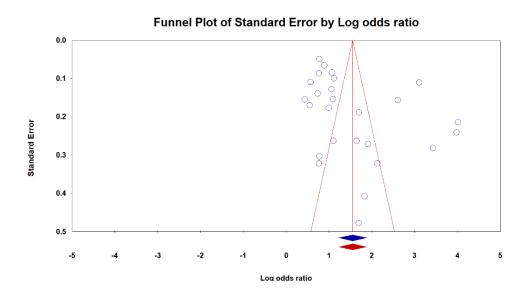
Appendix26: Funnel plot for the relationship between high density lipoprotein and nonalcoholic fatty liver



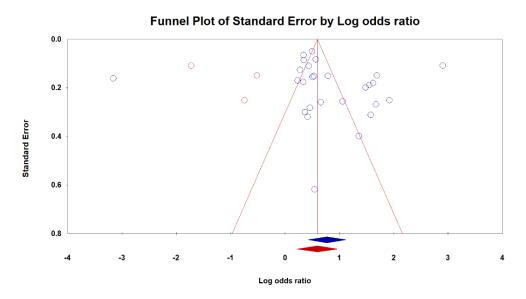
Appendix27: Funnel plot for the relationship between low density lipoprotein and nonalcoholic fatty liver



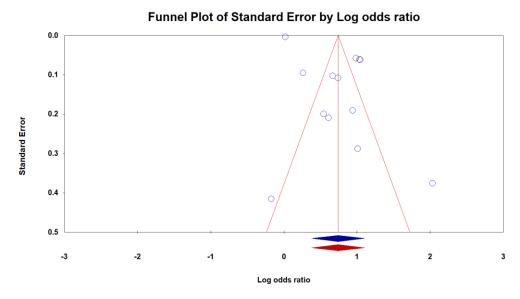
Appendix28: Funnel plot for the relationship between triglyceride and nonalcoholic fatty liver



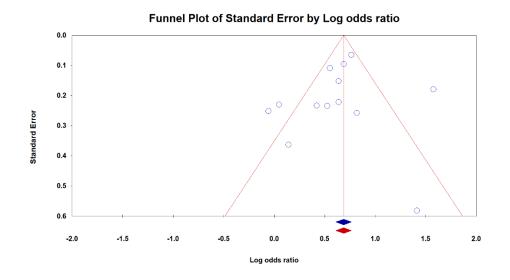
## Appendix29: Funnel plot for the relationship between alanine aminotransferase and nonalcoholic fatty liver



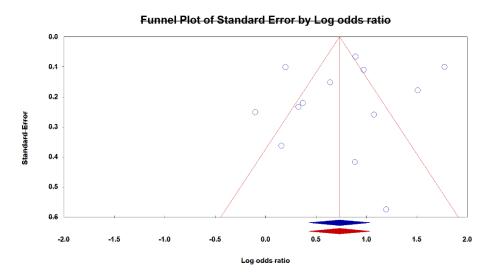
Appendix30: Funnel plot for the relationship between aspartate aminotransferase and nonalcoholic fatty liver



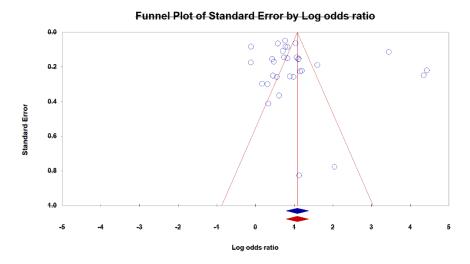
Appendix31: Funnel plot for the relationship between hypertension and nonalcoholic fatty liver



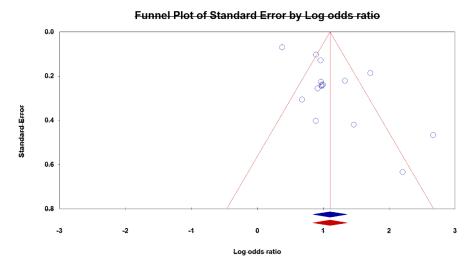
## Appendix32: Funnel plot for the relationship between systolic blood pressure and nonalcoholic fatty liver



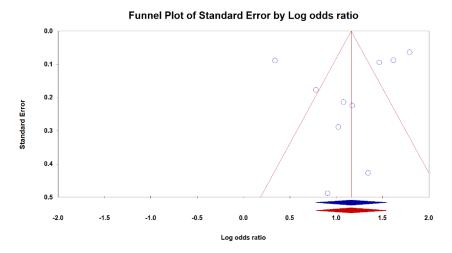
Appendix33: Funnel plot for the relationship between systolic blood pressure and nonalcoholic fatty liver



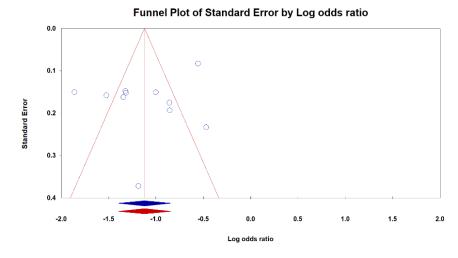
Appendix34: Funnel plot for the relationship between fasting blood sugar and nonalcoholic fatty liver



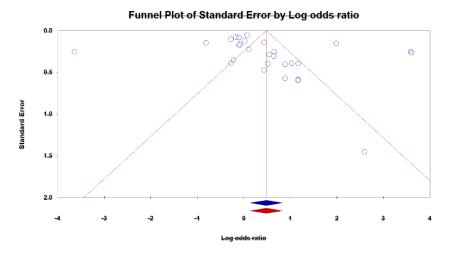
Appendix35: Funnel plot for the relationship between diabetes mellitus and nonalcoholic fatty liver



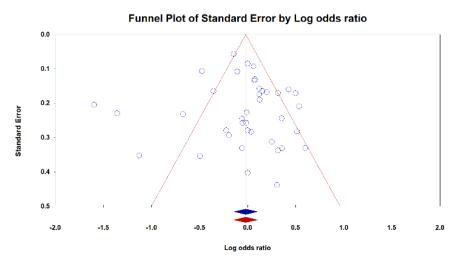
Appendix36: Funnel plot for the relationship between metabolic syndrome and nonalcoholic fatty liver



Appendix37: Funnel plot for the relationship between physical activity and nonalcoholic fatty liver



Appendix38: Funnel plot for the relationship between smoking and nonalcoholic fatty liver



Appendix39: Funnel plot for the relationship between gender and nonalcoholic fatty liver

Appendix 40: Search strategy and keywords of this systematic review and meta-analysis

PubMed	(("Non-alcoholic Fatty Liver Disease"[Mesh]) AND (((((((((((((((((((((((((((((((((((
	(prevalence[Title/Abstract])) OR (incidence[Title/Abstract])) OR (frequency[Title/Abstract])) OR (risk
	factor[Title/Abstract])) OR (risk factors[Title/Abstract])) OR (related factor[Title/Abstract])) OR (related
	factors[Title/Abstract])) OR (relate factor[Title/Abstract])) OR (relate factors[Title/Abstract])) OR (associated
	factor[Title/Abstract])) OR (associated factors[Title/Abstract])) OR (associate factor[Title/Abstract])) OR (associate
	factors[Title/Abstract])) OR (odd ratio[Title/Abstract])) OR (odds ratio[Title/Abstract])) OR
	(epidemiologic[Title/Abstract]))) AND (((((Iran[Title/Abstract]) OR (Iranian[Title/Abstract])) OR (Iranian
	population[Title/Abstract])) OR (Iranian people[Title/Abstract])) OR (Iran[Affiliation])).
Scopus	TITLE-ABS-KEY ("Non alcoholic Fatty Liver Disease" OR "NAFLD" OR "Nonalcoholic Fatty Liver Disease"
_	OR "Fatty Liver, Nonalcoholic" OR "Fatty Livers, Nonalcoholic" OR "Liver, Nonalcoholic Fatty" OR "Livers,
	Nonalcoholic Fatty" OR "Nonalcoholic Fatty Liver" OR "Nonalcoholic Fatty Livers" OR "Nonalcoholic
	Steatohepatitis" OR "Nonalcoholic Steatohepatitides" OR "Steatohepatitides, Nonalcoholic" OR "Steatohepatitis,
	Nonalcoholic") AND TITLE-ABS-KEY ("Epidemiology" OR "Social Epidemiology" OR "Epidemiologies, Social"
	OR "Epidemiology, Social" OR "Social Epidemiologies" OR "Prevalence" OR "Period Prevalence" OR "Period
	Prevalences" OR "Prevalence, Period" OR "Point Prevalence" OR "Point Prevalences" OR "Prevalence, Point" OR
	"Incidence" OR "Incidences" OR "Secondary Attack Rate" OR "Attack Rate, Secondary" OR "Rate, Secondary
	Attack" OR "Secondary Attack Rates" OR "Incidence Proportions" OR "Proportion, Incidence" OR "Attack Rate"
	OR "Attack Rates" OR "Rate, Attack" OR "Cumulative Incidence" OR "Cumulative Incidences" OR "Incidence,
	Cumulative" OR "Incidence Rate" OR "Incidence Rates" OR "Rate, Incidence" OR "Person-time Rate" OR
	"Person time Rate" OR "Person-time Rates" OR "Rate, Person-time" OR "Frequency" OR "Risk factor" OR
	"Factor, Risk" OR "Social Risk Factors" OR "Factor, Social Risk" OR "Factors, Social Risk" OR "Risk Factor,
	Social" OR "Risk Factors, Social" OR "Social Risk Factor" OR "Health Correlates" OR "Correlates, Health" OR
	"Population at Risk" OR "Populations at Risk" OR "Risk Scores" OR "Risk Score" OR "Score, Risk" OR "Risk
	Factor Scores" OR "Risk Factor Score" OR "Score, Risk Factor" OR "Risk factors" OR "Related factors" OR
	"Relate factor" OR "Relate factors" OR "Associated factor" OR "Associated factors" OR "Associate factor" OR
	"Associate factors" OR "Odds ratio" OR "Cross-Product Ratio" OR "Cross Product Ratio" OR "Cross-Product
	Ratios" OR "Ratio, Cross-Product" OR "Ratios, Cross-Product" OR "Relative Odds" OR "Odds, Relative" OR
	"Risk Ratio" OR "Ratio, Risk" OR "Ratios, Risk" OR "Risk Ratios" OR "Odd ratio" OR "Epidemiologic") AND
	TITLE-ABS-KEY ("Iran" OR "Iranian" OR "Iranian people" OR "Iranian population"))
WoS/ISI,	(("Non alcoholic Fatty Liver Disease" OR "NAFLD" OR "Nonalcoholic Fatty Liver Disease" OR "Fatty Liver,
and	Nonalcoholic" OR "Fatty Livers, Nonalcoholic" OR "Liver, Nonalcoholic Fatty" OR "Livers, Nonalcoholic Fatty"
ProQuest	OR "Nonalcoholic Fatty Liver" OR "Nonalcoholic Fatty Livers" OR "Nonalcoholic Steatohepatitis" OR

"Nonalcoholic Steatohepatitides" OR "Steatohepatitides, Nonalcoholic" OR "Steatohepatitis, Nonalcoholic") AND ("Epidemiology" OR "Social Epidemiology" OR "Epidemiologies, Social" OR "Epidemiology, Social" OR "Social Epidemiologies" OR "Prevalence" OR "Period Prevalence" OR "Period Prevalences" OR "Prevalence, Period" OR "Point Prevalence" OR "Point Prevalences" OR "Prevalence, Point" OR "Incidence" OR "Incidences" OR "Secondary Attack Rate" OR "Attack Rate, Secondary" OR "Rate, Secondary Attack" OR "Secondary Attack Rates" OR "Incidence Proportions" OR "Proportion, Incidence" OR "Attack Rate" OR "Attack Rates" OR "Rate, Attack" OR "Cumulative Incidence" OR "Cumulative Incidences" OR "Incidence, Cumulative" OR "Incidence Rate " OR "Incidence Rates" OR "Rate, Incidence" OR "Person-time Rate" OR "Person time Rate" OR "Person-time Rates" OR "Rate, Person-time" OR "Frequency" OR "Risk factor" OR "Factor, Risk" OR "Social Risk Factors" OR "Factor, Social Risk" OR "Factors, Social Risk" OR "Risk Factor, Social" OR "Risk Factors, Social" OR "Social Risk Factor" OR "Health Correlates" OR "Correlates, Health" OR "Population at Risk" OR "Populations at Risk" OR "Risk Scores" OR "Risk Score" OR "Score, Risk" OR "Risk Factor Scores" OR "Risk Factor Score" OR "Score, Risk Factor" OR "Risk factors" OR "Related factors" OR "Relate factors" OR "Relate factors" OR "Associated factor" OR "Associated factors" OR "Associate factor" OR "Associate factors" OR "Odds ratio" OR "Cross-Product Ratio" OR "Cross Product Ratio" OR "Cross-Product Ratios" OR "Ratio, Cross-Product" OR "Ratios, Cross-Product" OR "Relative Odds" OR "Odds, Relative" OR "Risk Ratio" OR "Ratio, Risk" OR "Ratios, Risk" OR "Risk Ratios" OR "Odd ratio" OR "Epidemiologic") AND ("Iran" OR "Iranian" OR "Iranian people" OR "Iranian population"))

Appendix 41: Quality assessment of included studies

Num ber of studie	Author, year	Questi on 1	Questi on 2	Questi on 3	Questi on 4	Questi on 5	Questi on 6	Questi on 7	Questi on 8	Questi on 9	Questi on 10	Tot al sco
S												re
Study	Abbasalizad	Yes	Unclea		9/1							
1	Farhangi,2016(1)									r		0
Study	Adibi ,2017(2)	Yes	Yes	Yes	Yes	No	No	Yes	Yes			6/8
2												
Study	Alavian,2008(3)	Yes	No	Yes	Yes	No	No	Yes	Yes			5/8
3												
Study	Amirkalali,2014(4)	Yes			8/8							
4												

Study	Bagheri	Unclea	Yes	Unclea	Yes	8/1						
5	Lankarani,2013 (2)(5)	r								r		0
Study	Bagheri	Yes	Yes	Yes	Yes	No	No	Yes	Yes			6/8
6	Lankarani,2013(6)											
Study	Bahrami,2019(7)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclea	Yes	9/1
7										r		0
Study	Birjandi,2016(8)	Yes	Yes	Yes	Yes	No	No	Yes	Yes			6/8
8												
Study	Damavandi,2021(9)	Yes	No	Yes	Yes	Yes	No	No	Yes	Unclea	No	5/1
9										r		0
Study	Darand, M. 2019(10)	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Unclea	Yes	8/1
10	, , , ,									r		0
Study	Dehghan, 2015(11)	Yes	No	Yes	Yes	No	No	Yes	Yes			5/8
11												
Study	Dehghanseresht,2020(	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclea	Yes	9/1
12	12)									r		0
Study	Doustmohammadian,2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			8/8
13	022(13)											
Study	Ebrahimi	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclea	Yes	9/1
14	Mousavi,2022(14)									r		0
Study	Emamat,2021(15)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Unclea	Yes	8/1
15		100	110							r	100	0
Study	Entezari,2021(16)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclea	Yes	9/1
16		100								r	100	0
Study	Eshraghian,2013(17)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			8/8
17	25114511411,2015(17)	105	105	105	105	105	105	105	105			0,0
Study	Fadaei,2018(18)	No	Yes	No		8/1						
18	1 44401,2010(10)	110	105	105	105	105	105	105	105	110		0
Study	Fattahi,2018(19)	Yes	Yes	Yes	Yes	No	No	Yes	Yes			6/8
19	1 4114111,2010(1)	105	105	105	105			105	105			0,0
Study	Ghaemi,2018(20)	No	Yes	Yes	Yes	No	No	Yes	Yes			5/8
20	Giaciii,2010(20)	110	103	103	103	110	110	103	103			3/0
20											1	

Study 21	Hashemian,2021(21)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			8/8
Study 22	Hekmatdoost,2016(22	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	9/1 0
Study 23	Honarvar, 2019(23)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			8/8
Study 24	Khoshbaten,2009(24)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclea r	Yes	9/1 0
Study 25	Kolahi,2015(25)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	8/1 0
Study 26	Lotfi,2019(26)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclea r	Yes	9/1 0
Study 27	MansourGhanaei, 2018(27)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			8/8
Study 28	Mohammadi,2011(28)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	7/1 0
Study 29	Mohammadifard,2019 (29)	Yes	No	Yes	Yes	No	No	Yes	Yes			5/8
Study 30	Mohseni,2016(30)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclea r	Yes	9/1 0
Study 31	Mokhtari, 2017(31)	Unclea r	Unclea r	No	Yes	No	Yes	Yes	Yes	Unclea r	Yes	5/1
Study 32	Moradzad,2022(32)	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	7/1 0
Study 33	Mosallaei,2015(33)	Unclea r	Yes	No	Yes	Yes	Yes	Yes	Yes	Unclea r	Yes	7/1 0
Study 34	Motamed,2016(34)	Unclea r	Yes	Yes	Yes	Yes	Yes	Yes	Yes			7/8
Study 35	Motamed,2020 (35)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	9/1 0
Study 36	Najafi,2022(36)	Yes	No	No	Yes	Yes	No	No	Yes	Unclea r	Yes	5/1 0

Study	Ostovaneh,2015(37)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			8/8
37												
Study 39	Pasdar,2016(38)	Unclea r	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9/1 0
Study	Pasdar,2017(39)	Unclea	Unclea	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8/1
40	D 1 2010(40)	r	r	<b>X</b> 7	<b>X</b> 7	3.7	3.7	<b>T</b> 7	3.7	37	3.7	0
Study 41	Pasdar,2019(40)	Unclea r	Unclea r	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8/1 0
Study 42	Radmard,2016(41)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			8/8
Study 43	Rezapour,2021(42)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclea r	Yes	9/1 0
Study 44	Salehi- Sahlabadi,2021(43)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclea r	Yes	9/1 0
Study 45	Savadkoohi,2002(44)	Yes	No	Yes	Yes	No	No	Yes	Yes			5/8
Study 46	Shanaki,2016(45)	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclea r	Yes	8/1
Study 47	Sohouli,2020(46)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10/ 10
Study 48	Sohouli,2021(47)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10/ 10
Study 49	Taheri,2022(48)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	9/1 0
Study 50	Totunchi,2021(1)(49)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Unclea r	Yes	8/1
Study 51	Totunchi,2021(2)(50)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclea r	Yes	9/1
Study 52	Totunchi,2021(3)(51)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclea r	Yes	9/1
Study 53	Vahid,2019(52)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Unclea r	Yes	8/1 0

Study	Zarean,2019 (53)	Unclea	Yes	Unclea	Yes	8/1						
54		r								r		0
Study	Zolfaghari,2016(54)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Unclea	Yes	7/1
55										r		0

JBI checklist questions for cross section studies: 1. Were the criteria for inclusion in the sample clearly defined? 2. Were the study subjects and the setting described in detail? 3. Was the exposure measured in a valid and reliable way? 4. Were objective, standard criteria used for measurement of the condition? 5. Were confounding factors identified? 6. Were strategies to deal with confounding factors stated? 7. Were the outcomes measured in a valid and reliable way? 8. Was appropriate statistical analysis used?

JBI checklist questions for case control studies: 1. Were the groups comparable other than the presence of disease in cases or the absence of disease in controls? 2. Were cases and controls matched appropriately? 3. Were the same criteria used for identification of cases and controls? 4. Was exposure measured in a standard, valid and reliable way? 5. Was exposure measured in the same way for cases and controls? 6. Were confounding factors identified? 7. Were strategies to deal with confounding factors stated? 8. Were outcomes assessed in a standard, valid and reliable way for cases and controls? 9. Was the exposure period of interest long enough to be meaningful? 10. Was appropriate statistical analysis used?

- 1. Abbasalizad Farhangi M, Mohseni F, Farajnia S, Jafarabadi MA. Major components of metabolic syndrome and nutritional intakes in different genotype of UCP2 -866G/A gene polymorphisms in patients with NAFLD. J Transl Med. 2016;14(1):177.
- 2. Adibi A, Maleki S, Adibi P, Etminani R, Hovsepian S. Prevalence of nonalcoholic fatty liver disease and its related metabolic risk factors in Isfahan, Iran. Advanced biomedical research. 2017;6.
- 3. Alavian S, Ramezani M, Bazzaz A, Azuzabadi Farahani M, Behnava B, Keshvari M. Frequency of fatty liver and some of its risk factors in asymptomatic carriers of HBV attending the Tehran blood transfusion organization hepatitis clinic. Iranian Journal of Endocrinology and Metabolism. 2008;10(2):99-106.
- 4. Amirkalali B, Poustchi H, Keyvani H, Khansari MR, Ajdarkosh H, Maadi M, et al. Prevalence of non-alcoholic fatty liver disease and its predictors in north of Iran. Iranian journal of public health. 2014;43(9):1275.
- 5. Lankarani KB, Mahmoodi M, Lotfi M, Zamiri N, Heydari ST, Ghaffarpasand F, et al. Common carotid intima-media thickness in patients with non-alcoholic fatty liver disease: a population-based case-control study. The Korean Journal of Gastroenterology. 2013;62(6):344-51.
- 6. Lankarani KB, Ghaffarpasand F, Mahmoodi M, Lotfi M, Zamiri N, Heydari ST, et al. Non alcoholic fatty liver disease in southern Iran: a population based study. Hepat Mon. 2013;13(5):e9248.
- 7. Bahrami A, Teymoori F, Eslamparast T, Sohrab G, Hejazi E, Poustchi H, et al. Legume intake and risk of nonalcoholic fatty liver disease. Indian J Gastroenterol. 2019;38(1):55-60.
- 8. Birjandi M, Ayatollahi SMT, Pourahmad S, Safarpour AR. Prediction and diagnosis of non-alcoholic fatty liver disease (NAFLD) and identification of its associated factors using the classification tree method. Iranian Red Crescent Medical Journal. 2016;18(11).
- 9. Damavandi N, Zeinali S. Association of xenobiotic-metabolizing enzymes (GSTM1 and GSTT 1), and pro-inflammatory cytokines (TNF-α and IL-6) genetic polymorphisms with non-alcoholic fatty liver disease. Mol Biol Rep. 2021;48(2):1225-31.
- 10. Darand M, Darabi Z, Yari Z, Hekmatdoost A. Fructose Consumption is Associated with Non-Alcoholic Fatty Liver Disease Risk: A Case-Control Study from Iran. Hepatitis Monthly. 2019;19(4).
- 11. Dehghan P, Miwechi M, Izadi E, Mohammadi F, Sohrabi MR. Comparison of physical activity and body mass index in patients with and without non-alcoholic fatty liver disease. 2015.
- 12. Dehghanseresht N, Jafarirad S, Alavinejad SP, Mansoori A. Association of the dietary patterns with the risk of non-alcoholic fatty liver disease among Iranian population: a case-control study. Nutrition journal. 2020;19(1):1-9.
- 13. Doustmohammadian A, Clark CC, Maadi M, Motamed N, Sobhrakhshankhah E, Ajdarkosh H, et al. Favorable association between Mediterranean diet (MeD) and DASH with NAFLD among Iranian adults of the Amol Cohort Study (AmolCS). Scientific Reports. 2022;12(1):1-9.
- 14. Ebrahimi Mousavi S, Dehghanseresht N, Dashti F, Khazaei Y, Salamat S, Asbaghi O, et al. The association between Dietary Diversity Score and odds of nonalcoholic fatty liver disease: a case-control study. Eur J Gastroenterol Hepatol. 2022;34(6):678-85.

- 15. Emamat H, Ghalandari H, Totmaj AS, Tangestani H, Hekmatdoost A. Calcium to magnesium intake ratio and non-alcoholic fatty liver disease development: a case-control study. BMC Endocr Disord. 2021;21(1):51.
- 16. Entezari MR, Talenezhad N, Mirzavandi F, Rahimpour S, Mozaffari-Khosravi H, Fallahzadeh H, et al. Mediterranean dietary pattern and non-alcoholic fatty liver diseases: a case-control study. J Nutr Sci. 2021;10:e55.
- 17. Eshraghian A, Dabbaghmanesh MH, Eshraghian H, Fattahi MR, Omrani GR. Nonalcoholic fatty liver disease in a cluster of Iranian population: thyroid status and metabolic risk factors. Arch Iran Med. 2013;16(10):584-9.
- 18. Fadaei R, Poustchi H, Meshkani R, Moradi N, Golmohammadi T, Merat S. Impaired HDL cholesterol efflux capacity in patients with non-alcoholic fatty liver disease is associated with subclinical atherosclerosis. Sci Rep. 2018;8(1):11691.
- 19. Fattahi N, Sharifi K, Moradi G, Iri R, Reshadat R, Ataee P, et al. Prevalence of non-alcoholic fatty liver disease in Kurdistan province, Iran, 2013–2014: a population based study. Govaresh. 2018;23(2):107-13.
- 20. Ghaemi A, Hosseini N, Osati S, Ehrampoush E, Honarvar B, Homayounfar R. Waist circumference is a mediator of dietary pattern in Non-alcoholic fatty liver disease. Scientific reports. 2018;8(1):1-9.
- 21. Hashemian M, Merat S, Poustchi H, Jafari E, Radmard AR, Kamangar F, et al. Red Meat Consumption and Risk of Nonalcoholic Fatty Liver Disease in a Population With Low Meat Consumption: The Golestan Cohort Study. Am J Gastroenterol. 2021;116(8):1667-75.
- 22. Hekmatdoost A, Shamsipour A, Meibodi M, Gheibizadeh N, Eslamparast T, Poustchi H. Adherence to the Dietary Approaches to Stop Hypertension (DASH) and risk of Nonalcoholic Fatty Liver Disease. Int J Food Sci Nutr. 2016;67(8):1024-9.
- 23. Honarvar B, Lankarani KB, Keshani P, Rafiee T. Dietary Determinants of Non-Alcoholic Fatty Liver Disease in Lean and Non-Lean Adult Patients: A Population-Based Study in Shiraz, Southern Iran. Hepatitis Monthly. 2017;17(4).
- 24. Khoshbaten M, Fatahi E, Soomi H, Farhang S, Majidi G, Fatahi V. Clinico-biochemical comparison of patients with Nonalcoholic fatty liver disease and healthy populace. Zahedan Journal of Research in Medical Sciences. 2009;11(1).
- 25. Kolahi AA, Pakdaman R, Mivehchi M, Dehghan P. Comparison of nutritional behaviors and body mass index in patients with and without non-alcoholic fatty liver diseases. 2015.
- 26. Lotfi A, Saneei P, Hekmatdost A, Salehisahlabadi A, Shiranian A, Ghiasvand R. The relationship between dietary antioxidant intake and physical activity rate with nonalcoholic fatty liver disease (NAFLD): A case Control study. Clin Nutr ESPEN. 2019;34:45-9.
- 27. Mansour-Ghanaei R, Mansour-Ghanaei F, Naghipour M, Joukar F, Atrkar-Roushan Z, Tabatabaii M, et al. The role of anthropometric indices in the prediction of non-alcoholic fatty liver disease in the PERSIAN Guilan Cohort study (PGCS). Journal of Medicine and Life. 2018;11(3):194.
- 28. Mohammadi A, Sedani HH, Ghasemi-Rad M. Evaluation of carotid intima-media thickness and flow-mediated dilatation in middle-aged patients with nonalcoholic fatty liver disease. Vasc Health Risk Manag. 2011;7:661-5.
- 29. Mohammadifard M, Saremi Z, Rastgoo M, Akbari E. Relevance between helicobacter pylori infection and non-alcoholic fatty liver disease in Birjand, Iran. Journal of medicine and life. 2019;12(2):168.

- 30. Mohseni F, Rashvand Z, Najafipour R, Hadizadeh S, Moghbelinejad S. Evaluating-238 G > A Polymorphism Association in TNF-alpha Gene with Metabolic Parameters and Nutritional Intakes Among the Iranian NAFLD Patients. Biochemical Genetics. 2016;54(5):685-95.
- 31. Mokhtari Z, Poustchi H, Eslamparast T, Hekmatdoost A. Egg consumption and risk of non-alcoholic fatty liver disease. World journal of hepatology. 2017;9(10):503.
- 32. Moradzad M, Abdi M, Sheikh Esmaeili F, Ghaderi D, Rahmani K, Moloudi MR, et al. Possible correlation between high circulatory levels of trimethylamine-N-oxide and 2177G>C polymorphisms of hepatic flavin containing monooxygenase 3 in Kurdish Population with non-alcoholic fatty liver disease. Mol Biol Rep. 2022;49(7):5927-37.
- 33. Mosallaei Z, Mazidi M, Safariyan M, Norouzy A, Mohajeri SAR, Esmaily H, et al. Dietary intake and its relationship with non-alcoholic fatty liver disease (NAFLD). Mediterranean Journal of Nutrition and Metabolism. 2015;8(2):139-48.
- 34. Motamed N, Maadi M, Sohrabi M, Keyvani H, Poustchi H, Zamani F. Rural residency has a protective effect and marriage is a risk factor for NAFLD. Hepatitis Monthly. 2016;16(7).
- 35. Motamed N, Khoonsari M, Panahi M, Rezaie N, Maadi M, Tameshkel FS, et al. The incidence and risk factors of non-alcoholic fatty liver disease: A cohort study from Iran. Hepatitis Monthly. 2020;20(2).
- 36. Najafi M, Rafiei A, Ghaemi A, Hosseini V. Association between rs738408, rs738409 and rs139051polymorphisms in PNPLA3 gene and non-alcoholic fatty liver disease. Gene Reports. 2022;26.
- 37. Ostovaneh MR, Zamani F, Ansari-Moghaddam A, Sharafkhah M, Saeedian FS, Rohani Z, et al. Nonalcoholic fatty liver: the association with metabolic abnormalities, body mass index and central obesity—a population-based study. Mary Ann Liebert, Inc. 140 Huguenot Street, 3rd Floor New Rochelle, NY 10801 USA; 2015. p. 304-11.
- 38. Pasdar Y, Rahimi F, Darbandi M, Nazar M, Niazi P, Nachvak S. The relationship between anthropometric indexes and blood biomarkers with fatty liver-a case-control study; Kermanshah, Iran. International Journal of Pharmacy and Technology. 2016;8(2):12837-46.
- 39. Pasdar Y, Darbandi M, Niazi P, Bagheri A, Mohajeri SAR, Norouzy A, et al. The risk factors of metabolic syndrome and nutritional status in patients with non-alcoholic fatty liver disease: A case-control study in Kermanshah, Iran. Acta Medica. 2017;33:715.
- 40. Pasdar Y, Moradi S, Moludi J, Darbandi M, Niazi P, Nachvak SM, et al. Risk of metabolic syndrome in non-alcoholic fatty liver disease patients. Mediterranean Journal of Nutrition and Metabolism. 2019;12(4):353-63.
- 41. Radmard AR, Rahmanian MS, Abrishami A, Yoonessi A, Kooraki S, Dadgostar M, et al. Assessment of Abdominal Fat Distribution in Non-Alcoholic Fatty Liver Disease by Magnetic Resonance Imaging: a Population-based Study. Arch Iran Med. 2016;19(10):693-9.
- 42. Rezapour S, Khosroshahi SA, Farajnia H, Mohseni F, Khoshbaten M, Farajnia S. Association of 45-bp ins/del polymorphism of uncoupling protein 2 (UCP2) and susceptibility to nonalcoholic fatty liver and type 2 diabetes mellitus in North-west of Iran. BMC Res Notes. 2021;14(1):169.

- 43. Salehi-Sahlabadi A, Sadat S, Beigrezaei S, Pourmasomi M, Feizi A, Ghiasvand R, et al. Dietary patterns and risk of non-alcoholic fatty liver disease. BMC Gastroenterol. 2021;21(1):41.
- 44. Savadkouhi F, HosseiniTabatabaei M, Nezhad SS. The frequency of fatty liver in sonography of patients without liver diseases background and its correlation with blood cholesterol and triglyceride. Zahedan Journal of Research in Medical Sciences. 2003;5(3).
- 45. Shanaki M, Fadaei R, Moradi N, Emamgholipour S, Poustchi H. The Circulating CTRP13 in Type 2 Diabetes and Non-Alcoholic Fatty Liver Patients. PLoS One. 2016;11(12):e0168082.
- 46. Sohouli MH, Fatahi S, Sayyari A, Olang B, Shidfar F. Associations between dietary total antioxidant capacity and odds of non-alcoholic fatty liver disease (NAFLD) in adults: a case-control study. J Nutr Sci. 2020;9:e48.
- 47. Sohouli MH, Sayyari AA, Lari A, Nameni G, Lotfi M, Fatahi S, et al. Association of dietary insulinaemic potential and odds of non-alcoholic fatty liver disease among adults: A case-control study. J Hum Nutr Diet. 2021;34(5):901-9.
- 48. Taheri E, Pourhoseingholi MA, Moslem A, Hassani AH, Jarrahi AM, Aghdaei HA, et al. The triglyceride-glucose index as a clinical useful marker for metabolic associated fatty liver disease (MAFLD): a population-based study among Iranian adults. Journal of Diabetes and Metabolic Disorders. 2022;21(1):97-107.
- 49. Tutunchi H, Saghafi-Asl M, Ebrahimi-Mameghani M, Ostadrahimi A. Food Insecurity and Lipid Profile Abnormalities Are Associated with an Increased Risk of Nonalcoholic Fatty Liver Disease (NAFLD): A Case-Control Study. Ecol Food Nutr. 2021;60(4):508-24.
- 50. Tutunchi H, Saghafi-Asl M, Asghari-Jafarabadi M, Ostadrahimi A. Association between Dietary Patterns and Non-alcoholic Fatty Liver Disease: Results from a Case-Control Study. Arch Iran Med. 2021;24(1):35-42.
- 51. Tutunchi H, Mobasseri M, Aghamohammadzadeh N, Hooshyar J, Naeini F, Najafipour F. Serum neuregulin 4 (NRG-4) level and non-alcoholic fatty liver disease (NAFLD): A case-control study. Int J Clin Pract. 2021;75(10):e14555.
- 52. Vahid F, Hekmatdoost A, Mirmajidi S, Doaei S, Rahmani D, Faghfoori Z. Association Between Index of Nutritional Quality and Nonalcoholic Fatty Liver Disease: The Role of Vitamin D and B Group. Am J Med Sci. 2019;358(3):212-8.
- 53. Zarean E, Goujani R, Rahimian G, Ahamdi A. Prevalence and risk factors of non-alcoholic fatty liver disease in southwest Iran: a population-based case-control study. Clinical and experimental hepatology. 2019;5(3):224.
- 54. Zolfaghari H, Askari G, Siassi F, Feizi A, Sotoudeh G. Intake of nutrients, fiber, and sugar in patients with nonalcoholic fatty liver disease in comparison to healthy individuals. International journal of preventive medicine. 2016;7.