La Medicina del Lavoro

Occupational Safety and Health of Riders Working for Digital Food Delivery Platforms in the City of Milan, Italy

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Supplementary Material

S1. Questionnaire Evaluation Results

The evaluation of the questionnaire was conducted following Lynn et al., 1987 and Politt et al., 2006 and 2007. To this end, 8 evaluators were involved in the evaluation process. The expert panel was made up by health and safety professionals (occupational physicians, technicians from health and safety authority), labour law professionals working for the Municipality of Milan, and academic researchers operating in the occupational health and safety field. Experts were asked to rate the relevance and clarity of each item, and to suggest modifications. For each item, content Validity Index (I-CVI) was determined as the proportion of score 3 or 4 on the total number of scores. Finally, to evaluate the questionnaire as a whole, the "Scale-Content Validity Index" (S-CVI/Ave) was calculated as the average of all the computed I-CVIs. The whole document was considered of sufficient validity and clarity with S-CVI/Ave of 0.90 or higher. The evaluation of the questionnaire for both relevance and clarity was successfully completed with S-CVI/Ave score of 0.945 and 0.909 respectively if considering validity and clarity.

S2. Final Version Questionnaire

The final questionnaire is the outcome of both the evaluation process of the first draft and supplemental considerations and suggestions proposed by the same evaluators as well as by the workers we involved in the final review of the draft. The final version of the questionnaire is reported below. The S, O and M letters refer to Single choice, Open or Multiple choice type of answer.

Personal information items		**Answers**	
1	Do you understand Italian? (e.g. when you talk to an Italian customer, can you understand everything he/she says/asks you?)	Well Quite well With many difficulties I do not understand	S
2	Where were you born (Country of birth, e.g. Italy):	____	O
3	How many YEARS have you been in Italy:	____	O
4	Do you have the Italian citizenship?	Yes No	S
5	Sex	Male Female Intersex I prefer not to answer	S
6	How old are you (in years)?	____	O
7	Are you a student?	Yes No	S
8	What degree do you have?	Degree/master degree or upper High school Middle school or primary school Other:_____	S
9	Where do you live?	XXX XXX province Other areas in XXX	S
General information about work		**Answers**	
10	How many YEARS have you worked as a rider?	____	O
11	How many MONTHS have you worked as a rider?	____	O
12	How many platforms/companies are you currently working for?	one two more than two	S
13	Which platforms/companies do you work for?	Deliveroo Glovo Just Eat Uber eats My menù Other:_____	M
14	What kind of contract do you have?	With VAT number Permanent contract Occasional service Continuous collaboration (Co.co.co) I do not know Other:_____	S
15	What is the payment method used by your company?	Travelled km By hours Only number of deliveries Number of deliveries + travelled km	

General information about work		**Answers**	
16	How many hours a day do you work?	1-2 hours 3-4 hours 5-6 hours 7-8 hours >8 hours	S
17	How many days do you usually work a week?	1-2 days 3-4 days 5-6 days 7 days	S
18	How many deliveries do you usually make a day?	Less than 5 5 to 10 11 to 15 16-20 More than 20	S
19	How many kilometers do you usually make per day?	Less than 5 5 to 10 11 to 15 16-20 More than 20	S
20	Have you ever called for support to the labor union for work-related issues?	Yes No	S
21	If NO, why?	I've never heard of such things I never thought about it I don't trust them I ask other associations I talk with my colleagues Other:_____	S
Questions about safety		**Answers**	
22	Do you think your job is dangerous for your health/safety?	Absolutely no A little Enough Very dangerous	M
23	What type of transport means do you use most often?	Traditional bicycle E-bike Motor scooter/moped Electric scooter/kick-scooter Other:_____	
24	The means of transportation you use to work:	Is yours Is of the company Other:_____	S
25	Which of the following devices do you use during work?	Helmet Reflective vest Other reflective items Front lights Back lights Bell/horn/trumpet Back brace Gloves Other:_____	M

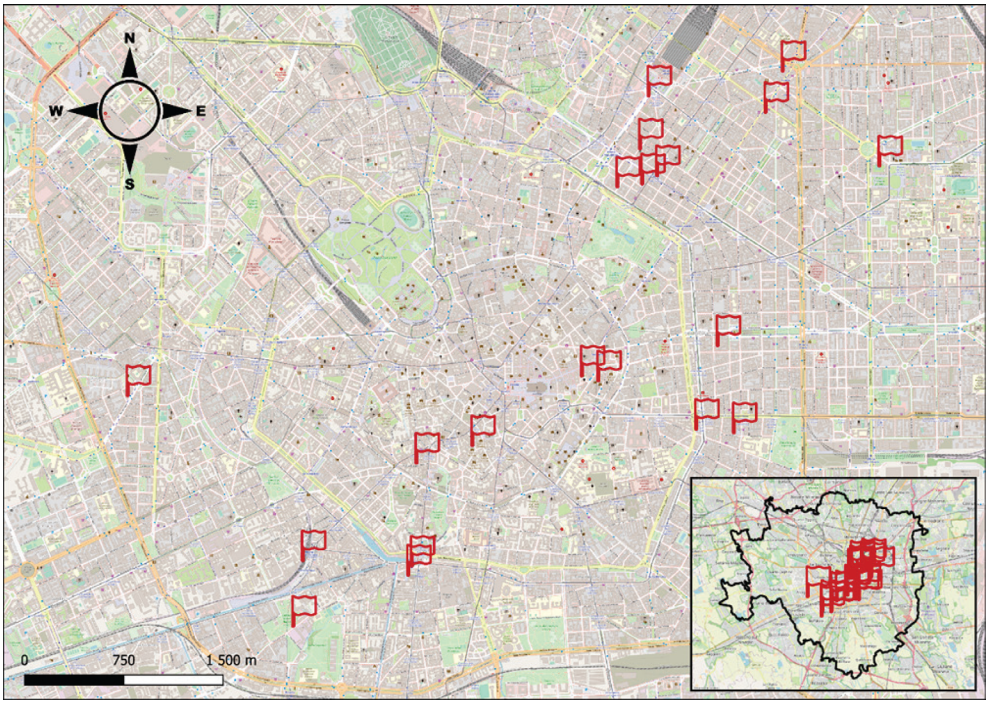
Questions about safety		**Answers**	
26	Have you taken one or more safety training courses?	Yes No	
27	Would you be interested to attend the following free courses organized by the City of Milan: Italian language Road and work safety	Yes No	S
28	What other topics would interested in for these courses?	_____	O
29	Which of the following concerns worries you the most while working? (please indicate a maximum of 5 options)	Traffic Your means of transport Using your mobile phone Air pollution Fatigue Road conditions (e.g: road potholes/holes) Cobblestones Tram tracks Number of deliveries The many hours in the saddle Being always available/ contactable The number of working hours Going around with the money of the deliveries Car not parked properly (e.g double parking) The speed of other vehicles Lack of bicycle paths/lanes The weight of the backpack None of these Other:_____	M

Questions about road accidents		**Answers**	
30	Over the past year, how many accidents have you had during deliveries?	_____	O
31	At what time did you have these accidents? morning (7-12): lunch time (12-15): afternoon (15-17): evening (17-19): night (22-7):	Yes No	S
32	How many times did you have to go to the hospital because of such accidents?	_____	O
33	Over the last year, which of the following types of accidents have you had?	Collision with the door of a parked vehicle Collision with pedestrian Fall to avoid pedestrian Crash/fall due to road conditions (e.g road potholes/holes)	

Questions about road accidents		Answers	
		Collision with car/truck Collision with motor scooter/moped Fall to avoid other vehicle Fall/collision due to inattention Fall/crash due to the use of mobile phone Fall caused by tram tracks Fall caused by wet cobblestones/ road Other:_____	M
34	Following accidents during deliveries, which consequences did you have:	Back pain/issues Neck or shoulder pain/issues Head or face pain/issues Wrists or arms or hand pain/ issues Knees or pelvis or legs or feet pain/issues Psychological issues (panic, depression, anxiety) Other:_____	M
Questions about assaults		**Answers**	
35	Over the past year, how many times have you been PHYSICALLY assaulted during work?	_____	O
36	What were the most frequent reasons for the PHYSICAL attacks you suffered? N.B: DO NOT provide information that may lead to the identification of yourself or others	Road issues (e.g.: a missed stop/ give-way sign) Theft of transported goods Theft of your vehicle Other:_____	M
37	Over the past year, how many times have you been assaulted VERBALLY during work?	_____	O
Questions about health		**Answers**	
38	Since you work as a rider, do you suffer from some of the following health issues?	Back pain/discomfort Arms or wrists or hands pain/ discomfort Neck or shoulder pain/ discomfort Knees pain/discomfort Persistent cough Inflammation of the throath Eye discomfort/inflammation Headache Fatigue Urinary/genital system issues Panic/depression or anxiety Other:_____	M

Supplementary items		**Answers**	
S1	Do you like your job?	A lot So and so A little I don't like it at all	S
S2	Specify why: N.B: DO NOT provide information that may lead to the identification of yourself or others	_____	O
S3	Are you going to change job in the next few months?	Yes No	S
S4	Specify why you intend to change jobs N.B: DO NOT provide information that may lead to the identification of yourself or others	_____	O
S5	Can you freely decide your working hours?	Yes, always Only a few times Rarely Never	S
S6	While working: I wear a backpack on my shoulders I load the backpack on the carrier	Yes, always Only a few times Rarely Never	S
S7	How often is your working vehicle checked/serviced?	1-3 months 4-6 months 7-12 months > 13 months Never I do not know	S
S8	During one or more of the reported road accidents, have you ever been afraid for your health/have you thought about dying?	Yes No I had no accident	S
S9	During one or more PHYSICAL ASSAULTS you suffered, have you ever been afraid for your health/ have you thought about dying?	Yes No I did not suffer any assault	S
S10	During one or more VERBAL ASSAULTS, have you ever been afraid for your health/have you thought about dying?	Yes No I did not suffer any assault	S
S11	Since you've been a rider, has your health deteriorated?	Not at all A little So and so A lot	S

S3. Map of XXX and Riders' Meeting Points, Where the Recruitment of Volunteers Was Performed. These Points Include the Following:



S4. Multivariate Logistic Regression for Overworking

In Models A, B, and C, we investigated the association between the platform, citizenship, and contract with overworking outcomes. All models were adjusted for education, age and student status of riders.

			Days/week = 7	Hours/day > 8
Variables			**CI95%**	**CI95%**
Model A	Platform	Platform B	1.00 (reference)	1.00 (reference)
		Platform C	20.30 (4.03-102.24)	4.64 (0.76-28.48)
		Platform A	67.91 (14.74-312.89)	19.24 (4.23-87.63)
		Multi-account	30.39 (6.58-140.39)	11.79 (2.50-55.52)
Model B	Citizenship	Yes	1.00 (reference)	1.00 (reference)
		No	4.25 (1.83-9.87)	2.23 (0.85-5.83)
Model C	Type of contract	Permanent	1.00 (reference)	1.00 (reference)
		Autonomous	5.70 (2.80-11.63)	3.69 (1.69-8.08)
		Precarious	1.40 (0.51-3.80)	0.40 (0.08-1.99)

S5. Road Accidents Information, Riders Could Give More than One Type of Answer

Sample size		**240**
Riders reporting road accidents, n (%)		91 (38)
Riders reporting road accidents by time, n (%)	evening (17-19)	36 (40)
	lunch time (12-15)	21 (23)
	dinner time (19-22)	17 (19)
	night (22-7)	14 (15)
	afternoon (15-17)	11 (12)
	morning (7-12)	9 (10)
Riders reporting road accidents by causes, n (%)	Fall by wet cobblestones/road	26 (29)
	Road conditions (e.g: road potholes/holes)	25 (27)
	Collision with car/truck	22 (24)
	Fall caused by tram tracks	13 (14)
	Collision with the door of a parked vehicle	12 (13)
	Fall to avoid other vehicle	8 (9)
	Fall to avoid pedestrian	7 (8)
	Fall/collision due to inattention	7 (8)
	Collision with motor scooter/moped	7 (8)
	Collision with pedestrian	3 (3)
	Other	3 (3)
	Fall/crash due to the use of mobile phone	1 (1)
	Fall down the stairs	1 (1)
Riders reporting health consequences after accidents, n (%)		81 (34)
Riders reporting health consequences after accidents by outcome, n (%)	Knees or pelvis or legs or feet pain/issues	39 (48)
	Back pain/issues	28 (35)
	Wrists or arms or hand pain/issues	25 (31)
	Neck or shoulder pain/issues	13 (16)
	Head or face pain/issues	6 (7)
	Psychological issues (panic, depression, anxiety)	4 (4)
	Chest	2 (2)
	None	1 (1)
Riders needing hospital assistance after road accidents, n(%)		32 (13)
Riders needing hospital assistance after road accidents by causes, n (%)	Collision with car/truck	13 (41)
	Road conditions (e.g: road potholes/holes)	11 (34)
	Fall by wet cobblestones/road	6 (19)
	Collision with motor scooter/moped	4 (13)
	Fall caused by tram tracks	3 (9)
	Fall/collision due to inattention	3 (9)
	Collision with the door of a parked vehicle	3 (9)
	Fall to avoid other vehicle	2 (6)
	Other	1 (3)
	Fall to avoid pedestrian	1 (3)
	Fall down the stairs	1 (3)
	Collision with pedestrian	1 (3)

S6. Multivariate Logistic Regression for Road Accidents

In Model A, B, C, D, and E we investigated the association between type of vehicle, fatigue, number of deliveries, the use of backpack, and the use of smartphone holder with road accidents. Model A was adjusted for age, student status, education, and type of contract. Model B was adjusted for age, student status, the type of contract, the type of vehicle, working hours/day, working day/week, the daily distance traveled, and the daily number of deliveries. Model C for age, student status, the type of contract, the type of vehicle, working hours/day, the daily distance traveled, and the type of contract. Models D was adjusted for education, age, and student status.

			Road accidents
Variables			**CI95%**
Model A	Type of vehicle	Normal bicycle	1.00 (reference)
		E-bike	2.23 (1.21-4.08)
		Other	1.27 (0.50-3.21)
Model B	Experiencing fatigue	No	1.00 (reference)
		Yes	2.71 (1.40-5.25)
Model C	Number of deliveries	<11	1.00 (reference)
		11-15	0.95 (0.0.45-1.98)
		>15	1.75 (0.76-4.02)
Model D	Use of backpack	no	1.00 (reference)
		yes	2.25 (0.90-5.67)

S7. Complete List of Type of Reported Health Issues

Sample size	**240**
Riders reporting health issues	150 (63)
Back	89 (59)
Fatigue	73 (49)
Neck/shoulders	48 (32)
Arms/wrists/hands	38 (59)
Headache	31 (59)
Knees	31 (59)
Eyes inflammation	16 (59)
Urinary/genital system	12 (59)
Panic/depression or anxiety	11 (59)
Persistent cough	9 (59)
Throath inflammation	6 (59)

S8. Multivariate Logistic Regression for Work-Related Health Issues

In Model A, B, C, D, and E we investigated the association between type of vehicle, the use of backpack, and travelled distance. Model A and B were adjusted for age, student status, education, and job duration. Model C was adjusted for age, student status, education, job duration, type of vehicle, working hours/day.

			Back pain	Fatigue
Variables			**CI95%**	**CI95%**
Model A	Type of vehicle	Normal bicycle	1.00 (reference)	1.00 (reference)
		E-bike	1.52 (0.83-2.77)	0.87 (0.46-1.65)
		Other	0.81 (0.30-2.18)	2.58 (0.99-6.69)
Model B	Use of backpack	No	1.00 (reference)	1.00 (reference)
		Yes	2.84 (1.31-6.16)	4.21 (1.54-11.54)
Model C	Daily traveled distance	<11	1.00 (reference)	1.00 (reference)
		11-15	2.55 (0.92-7.04)	1.42 (0.50-4.07)
		>15	2.91 (1.22-6.98)	2.86 (1.15-7.11)