

ORIGINAL ARTICLE

SHORT-TERM AND LONG-TERM EFFECTS OF THE ENHANCE ENFORCEMENT PROGRAMMES ON SEATBELT WEARING AMONG FRONT OCCUPANTS IN MALAYSIA

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ABSTRACT

- Introduction:** To determine the effectiveness of the enhance enforcement programmes (The Ops) on the percentage of seatbelt wearing among front occupants in Malaysia.
- Methodology:** The roadside observations for measuring the seatbelt wearing among front occupant were conducted before, two weeks and six months after the Ops. The study was conducted in selected states representing four different zones (Northern, Southern, Eastern and Central zones) of Peninsular Malaysia.
- Result:** A total of 12,298 drivers and 11,212 front occupants were observed for their seatbelt wearing status through out the study. Percentage of seatbelt wearing among drivers and front passengers were increased from the baseline of 82.6 % and 74.4 % to 92 % (95 % CI: 91.2, 92.7) and 87.0 % (95 % CI: 85.9, 88.0) after two week, but declined to 85.7 % (95 % CI: 84.4, 86.8) and 76.8 % (95 % CI: 75.2, 78.3) after six months of the Ops respectively. Pre and post analysis revealed that after 2 weeks, the Ops were significantly effective in increasing the seatbelt wearing among front passengers and drivers with the RR (95 % CI) of 1.17 (1.14, 1.20) and 1.12 (1.10, 1.13) respectively. However, after six months, the effectiveness of the Ops was reduced for both type of vehicle occupant.
- Conclusion:** This study sheds light on the importance of the enhance enforcement programme for increasing the seatbelt wearing in Malaysia. However, in order to give more impact on seatbelt wearing, the strategy and the frequency of the enhance enforcement programme in Malaysia may need to be revised.
- Keywords:** Front occupants seatbelt wearing, roadside observation, enforcement.

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INTRODUCTION

Seatbelt wearing is a vital and proven road safety intervention to prevent and reduce the number of death and serious injuries among vehicle occupants. In an event of a crash, seatbelt wearing reduces the risk of fatality among front passengers by 45 to 50 %^{1, 2}. It is most effective in frontal impact crashes, and they reduce the risk of death and serious injury by almost 50% for both drivers and front passengers^{3, 4}. Manual lap-shoulder belts are more effective than lap belts alone⁵.

Although the use of seatbelt is the most effective means of reducing fatal and non fatal injuries, unfortunately, in reality, not everyone wear it. Given the proven effectiveness of seatbelts wearing in reducing the number of deaths and severe injury cases, it was a matter of national interest to embark on effective interventions to promote seatbelt wearing. Review of evidence has shown that interventions related to law and enforcements are effective in increasing the seatbelt wearing rate⁶. Knowing the effects of seatbelts wearing, many countries have put into place legislation that requires vehicle occupants to wear safety belt as an effort to increase seatbelt wearing. However, not many countries have established a national data collection system to monitor and evaluate the success of the law implementation. Similarly, in Malaysia, as stipulated in the Motor Vehicles (Safety Seatbelts) Rules 1978, front occupants of a vehicle are required to wear safety belt since in the early seventies⁷. Since then, although front occupant are compulsory to wear seatbelt, there was no data collection system established for monitoring the changes in wearing rate. As a result, only a few studies were conducted to measure wearing rate in Malaysia. The earliest study was conducted among taxi drivers in 1993 in the city of Kuala Lumpur⁸, then followed by another study which was conducted in the state of Selangor⁹. However, these two studies were conducted at small scale and limited to particular geographic areas, which limit their generalizability. The first effort to measure seatbelt wearing at larger scale was conducted as part of the National Health and Morbidity Survey III (NHMS III) which was done in 2006¹⁰. The NHMS III reported that the compliance rate for front occupants was 71.3 %, whilst, there were no results mentioned about the patterns of compliance rate according to category of occupants (drivers, and front passengers), gender, vehicle type, road type and time.

Since 2001, Malaysia has been conducting a yearly enhance enforcement activities at national level. This yearly enforcement activity was called "Ops Bersepadu or the Intergrated Operation" which was done in collaboration with many agencies which include Road Safety Department, Road Transport Department, and Royal Malaysia Police. This integrated operation (the Ops) was done specifically during each festive season for two week durations. The aim of the operation was to reduce the number of traffic offences during each festive season that subsequently reduce the fatal crashes. During this period, the enforcement officers targeted on a few major offences that could lead to crashes such as speeding, red light running, driving under the influences of alcohol or drug, and dangerous driving. Besides that, the enforcement also focuses on helmet and seatbelt wearing. Unfortunately, there was no data collection system to collect information and outcomes related to this yearly integrated operation, only since 2008 the government started to monitor a few outcomes of the operation. This article not only report the effects of the enhance enforcement programmes (the ops) of existing law on the seatbelt wearing status but also reported the patterns of seatbelt wearing among front occupants in Malaysia. This information could be useful for the governments to support or revise the ops strategy and frequency in the future. The information also useful for other countries to learn especially for moderate and low income countries as many of them still varies in their seatbelt wearing status.

METHODS

Enhance enforcement campaign implementation (The Ops)

Activities on the enhance enforcement of safety belts laws can involve increasing the number of officers on patrol, increasing citation for safety belt violations or combination of these efforts. The efforts could be combined with advocacy activities to increase the awareness on the enforcement activities and may involves intense efforts of short duration that last for days of weeks⁶. This could be similar with the Integrated Operation (the Ops) that is conducted during busy festive season in Malaysia. The Ops aims to reduce the number of fatal crashes during the festive season. As such, the primary target was on a few major traffic offences such as speeding, red light running, dangerous overtaking, and driving under the influences of

alcohol and drugs. Wearing of safety devices such as helmet and seatbelt wearing were also of special focuses during this period. The Ops was normally conducted for two weeks duration covering before, during and after festive season. As no data was collected to evaluate the previous Ops, this report was the first data collection involving seatbelts wearing in relation to this enhance enforcement campaigns (the Ops). This article reported the effect of the Ops that was conducted nationwide from 19 Jan 2009 to 02 Feb 2009. As such, there was no control group for comparison in this evaluation.

Elements of the enhance enforcement campaign (the Ops):

- i. Inter-agency involvement which is coordinated by the Road Safety Department. The members include Royal Malaysia Police, Department of Transport, Ministry of Health, Highway and Expressway concessionaries, Media, and other emergency services providers such Fire and Rescue Department, Red Crescent, Department of Civil Defence.
- ii. During the period of the Ops, the number of road crashes and fatality were reported to the public on daily basis during prime time TV News. News on the enforcement activities were also aired on a regular basis.
- iii. The compound for major traffic offences such as speeding, red light running, dangerous overtaking, driving under the influence of drug and alcohol and not wearing safety belt were increase to a higher level (from RM 50–RM 100 to RM 300) as compared to normal day.
- iv. With the involvement of many agencies, visibility of enforcement officers was increased during this period.
- v. Emergency service providers were stationed at strategic locations along major highways in the country for emergency assistance to the road trauma victims if crashes occur.

Method of Evaluation

In order to evaluate the effectiveness of the Ops, field observations were done before (1st Jan 2009 – 15th Jan 2009), two weeks (15th Feb 2009 - 29th Feb 2009) and 6 months after the Ops (1st June 2009- 15th June 2009). There were no similar Ops in between before and after evaluation.

2.2.1 Seatbelt Wearing Observation Survey: Study setting and sample size determination

Sample size determination Taking a 5 % tolerable error at 95 % confidence interval, the minimum required sample size was calculated to be 384 subjects as determined by a single proportion formula based on 50 % estimated front occupant seatbelt wearing rate. This wearing rate was used as a starting point for calculations because it generated the highest number of observation required.

Study setting The study was conducted in seven randomly selected states representing four different zones (Northern, Southern, Eastern and Central zones) of Peninsular Malaysia. Two districts from each state were then randomly selected, as the study locations made up the total district involved to 14. Three observations site were then identified for each district made up the total observation sites to 42 sites. Criteria for site inclusion were slowing of traffic, and a safe position for viewing traffic at the closest distance. Examples of the observation sites were intersections and toll collection counters of a expressway.

Field observations Based on the calculated sample size, a minimum of 400 vehicles were observed at each study location. The final observation unit was vehicle occupant. The data on seatbelt wearing was collected manually using a form. Two research assistants were stationed at each observation site during each data collection period, rotated over the sites and time periods. All research assistants involved in data collection were trained on how to measure the safety belt wearing. The survey targeted all occupants of light-duty vehicles, which included cars, light trucks, vans, multipurpose vehicles (MPV) and sport utility vehicles (SUVs). Each observation period was for one hour, and took place during daylight hours (8am-9am, 1pm-2pm, 5pm-6pm). Vehicles with heavily tinted windscreen were excluded from the observation, however, the number of vehicles were excluded due to tinted window was not counted during the observation.

Data analysis

Data was entered by trained officers into a database using EpiInfo statistical software version 3.3.2. Then, data cleaning was done by a researcher before analysis using the same statistical software was performed. Descriptive analyses were performed, and

percentage of seat belt wearing and 95 % CI were calculated for driver and front passengers. To determine the effectiveness of the Ops, pre and post data were analysed using 2 by 2 table analyses. The relative risk and 95 % confidence interval were computed and taken as the final results for assessing the effectiveness of the Ops.

RESULTS

A total of 12,298 drivers and 11,212 front occupants were observed for their seatbelt wearing status through out the study period.

Pattern of Overall seatbelts wearing

The results of seat belt wearing status for drivers and front passengers are shown in Table 1 and 2.

Table 1 Seat Belt Usage Rate among Drivers Before and after Interventions

Seat Belt Use	Wearing Status	Before		After (short-term effect) 2 weeks post			After (Long-term effect) 6 months post		
		N	% (95 % CI)	N	% (95 % CI)	OR (95 % CI)	N	% (95 % CI)	OR ^a (95 % CI)
Overall	Belted	3600	82.6 (81.5, 83.7)	4404	92.0 (91.2, 92.7)	2.45 (2.15, 2.80)	2801	85.7 (84.4, 86.8)	1.46 (1.28, 1.67)
	Not Belted	770	17.4 (16.3, 18.5)	384	8.0 (7.3, 8.8)		409	14.3 (13.2, 15.6)	
Male	Belted	2980	83.4 (82.1, 84.6)	3663	93.7 (92.7, 94.4)	2.97 (2.53, 3.38)	2336	87.2 (85.8, 88.4)	1.35 (1.17, 1.57)
	Not Belted	594	16.6 (15.4, 17.9)	246	6.3 (5.6, 7.1)		344	12.8 (11.6, 14.2)	
Female	Belted	680	79.4 (76.5, 83.0)	738	84.2 (81.6, 86.6)	1.38 (1.07, 1.77)	465	78.9 (75.4, 82.1)	2.32 ^b (0.86, 6.73)
	Not Belted	175	20.6 (17.9, 23.5)	138	15.8 (13.4, 18.4)		124	21.1 (17.9, 24.6)	
Vehicle Type Car	Belted	2883	81.6 (80.3, 82.9)	3541	91.4 (90.4, 92.2)	2.39 (2.07, 2.79)	2157	84.5 (83.0, 85.9)	1.23 (1.07, 1.42)
	Not Belted	650	18.4 (17.1, 19.7)	334	8.6 (7.8, 9.6)		395	15.5 (14.1, 17.0)	
MPV/SUV	Belted	674	87.8 (85.2, 90.0)	745	95.0 (93.2, 96.4)	2.66 (1.78, 4.06)	585	90.0 (87.4, 92.1)	1.26 ^b (0.89, 1.78)
	Not Belted	94	12.2 (10.0, 14.8)	39	5.0 (3.6, 6.8)		65	10.0 (7.9, 12.6)	
Others	Belted	103	79.8 (71.9, 86.4)	116	91.3 (85.0, 98.5)	2.66 (1.19, 6.06)	59	86.8 (76.4, 93.8)	1.65 ^b (0.96, 4.10)
	Not Belted	26	20.2 (13.6, 18.1)	11	8.7 (4.4, 15.0)		9	13.2 (6.2, 23.6)	
Type of road Expressway	Belted	958	86.7 (84.5, 88.6)	1812	97.9 (97.1, 98.5)	7.13 (4.9, 10.41)	1213	93.6 (92.1, 94.5)	2.24 (1.68, 3.00)
	Not Belted	147	13.3 (11.4, 15.5)	39	2.1 (1.5, 2.9)		83	6.4 (5.2, 7.9)	
Non Expressway	Belted	2702	81.3 (79.9, 82.6)	2590	88.2 (87.0, 89.4)	1.73 (1.50, 2.00)	1588	80.4 (78.6, 82.2)	0.95 ^b (0.82, 1.10)
	Not Belted	623	18.7 (17.4, 20.1)	345	11.8 (10.6, 13.0)		386	19.6 (17.8, 21.4)	

^aOdd Ratio of Chi-square analysis: ^bNot significant

Table 2 Seat Belt Usage Rate among Front Seat Passengers before and after Interventions

Seat Belt Use		Before		After (Short-term effect) 2 weeks post			After (Long-term effect) 6 months post		
	Wearing Status	N	% (95 % CI)	N	% (95 % CI)	OR (95 % CI)	N	% (95 % CI)	OR (95 % CI)
Overall	Belted	3056	74.4 (73.0, 75.7)	3666	87.0 (85.9, 88.0)	2.30 (2.05, 2.58)	2217	76.8 (75.2, 78.3)	1.14 (1.02, 1.28)
	Not Belted	1054	25.6 (23.4, 27.0)	549	13.0 (12.0, 14.1)		670	23.2 (21.7, 24.8)	
Male	Belted	902	72.4 (69.8, 74.8)	1552	87.0 (85.3, 88.5)	2.55 (2.11, 3.09)	664	71.7 (68.7, 74.6)	0.97 ^b (0.80, 1.17)
	Not Belted	344	27.6 (25.2, 30.2)	232	13.0 (11.5, 14.7)		262	28.3 (25.4, 31.3)	
Female	Belted	2154	75.2 (73.6, 76.8)	2114	87.0 (85.5, 88.3)	2.20 (1.90, 2.55)	1553	79.2 (77.4, 81.0)	1.26 (1.09, 1.45)
	Not Belted	710	24.8 (23.2, 26.4)	317	13.0 (11.7, 14.5)		407	20.81 (19.0, 22.6)	
Vehicle Type Car	Belted	2384	73.1 (71.5, 74.6)	2917	86.1 (84.9, 87.2)	2.28 (2.01, 2.59)	1673	74.7 (72.8, 76.4)	1.08 ^b (0.96, 1.23)
	Not Belted	877	26.9 (25.4, 28.5)	471	13.9 (12.8, 15.1)		568	25.3 (23.6, 27.2)	
MPV/SUV	Belted	594	81.1 (78.1, 83.9)	652	92.4 (90.1, 94.2)	2.81 (1.98, 3.97)	495	85.1 (81.8, 87.8)	1.32 ^b (0.98, 1.79)
	Not Belted	138	18.9 (16.1, 21.9)	54	7.6 (5.8, 9.9)		87	14.9 (12.2, 18.2)	
Others	Belted	78	66.7 (57.4, 75.1)	97	80.2 (71.9, 86.9)	2.02 (1.08, 3.80)	49	76.6 (63.3, 86.2)	1.63 ^b (0.77, 3.47)
	Not Belted	39	33.3 (24.9, 42.6)	24	19.8 (13.1, 28.1)		15	23.4 (13.8, 35.7)	
Type of road									
Expressway	Belted	856	82.4 (79.4, 84.6)	1604	95.4 (94.2, 96.3)	4.40 (3.30, 5.86)	1010	85.7 (83.6, 87.7)	1.29 (1.02, 1.63)
	Not Belted	183	17.6 (15.4, 20.1)	78	4.6 (3.7, 5.8)		168	14.3 (12.3, 16.4)	
Non Expressway	Belted	2200	71.6 (70.0, 73.2)	2062	81.4 (79.8, 82.9)	1.73 (1.52, 1.97)	1207	70.6 (68.4, 72.8)	0.95 ^b (0.83, 1.09)
	Not Belted	871	28.4 (26.8, 30.0)	471	18.6 (17.1, 20.2)		502	29.4 (27.2, 31.6)	

^aOdd Ratio of Chi-square analysis: ^bNot significant

The percentage of seat belt wearing for drivers increased from 82.6 % (95 % CI: 81.5 – 83.7) to 92.0 % (95 % CI: 91.2, 92.7) and 85.7 and 85.7 % (95 % CI: 84.4, 86.8) two weeks and six months after the ops respectively. These increased in seat belt wearing pattern two weeks and six months after the ops were statistically significant as indicated by the Relative Risk (95 % CI) of 1.12 (1.10, 1.13) and 1.06 (1.04, 1.08)

respectively (Table 3). A similar pattern of increase was observed for front passengers with seat belt wearing increasing from 74.4 % (95 % CI: 73.0, 75.7) to 87.0 (95 % CI: 85.9, 88.0) and 76.8 % (95 % CI: 75.2, 78.3) two weeks and six months after the ops with the increase being statistically significant [RR (95% CI: 1.17 (1.14, 1.20) and 1.03 (1.01, 1.06) respectively] (Table 4).

Table 3 Effectiveness of the ops on driver's seat belt wearing status two weeks and six months after the Interventions

Seat Belt Use	Wearing Status	Before	After 2 weeks		After 6 months	
		N	N	RR ^a (95 % CI)	N	RR ^a (95 % CI)
Overall	Belted	360	4404	1.12 (1.10,1.13)	2801	1.06 (1.04,1.08)
	Not Belted	0	384		409	
Male	Belted	298	3663	1.12 (1.11,1.14)	2336	1.05 (1.02,1.07)
	Not Belted	0	246		344	
Female	Belted	680	738	1.06 (1.01,1.11)	465	0.99 ^b (0.94,1.05)
	Not Belted	175	138		124	
Vehicle Type Car	Belted	288	3541	1.12 (1.10,1.14)	2157	1.04 (1.01,1.06)
	Not Belted	3	334		395	
MPV/SUV	Belted	674	745	1.08 (1.05,1.12)	585	1.03 ^b (0.99,1.06)
	Not Belted	94	39		65	
Others	Belted	103	116	1.14 (1.03,1.27)	59	1.09 ^b (0.96, 1.23)
	Not Belted	26	11		9	
Type of road Expressway	Belted	958	1812	1.13 (1.10,1.16)	1213	1.08 (1.05,1.11)
	Not Belted	147	39		83	
Non Expressway	Belted	270	2590	1.09 (1.06,1.11)	1588	0.99 ^b (0.96, 1.02)
	Not Belted	2	345		386	

^a Relative Risk of 2x2 table analysis: ^bNot significant

Table 4 Effectiveness of the ops on Front Passenger's seat belt wearing status two weeks and six months after the Interventions

Seat Belt Use	Wearing Status	Before		After 2 weeks		After 6 months	
		N	N	RR ^a (95 % CI)		N	RR ^a (95 % CI)
Overall	Belted	305	3666	1.17		2217	1.03 (1.01, 1.06)
	Not Belted	6		(1.14,1.20)		670	
Male	Belted	105	549				
	Not Belted	4					
Female	Belted	902	1552	1.20		664	0.99 ^b (0.94,1.04)
	Not Belted	344	232	(1.16,1.25)		262	
Vehicle Type	Belted	215	2114	1.16		155	1.05 (1.02, 1.09)
	Not Belted	4		(1.13,1.19)		407	
Car	Belted	238	2917	1.18		1673	1.02 ^b (0.99,1.05)
	Not Belted	4		(1.15,1.21)		568	
MPV/SUV	Belted	877	471				
	Not Belted						
Others	Belted	594	652	1.14		495	1.05 ^b (1.00,1.10)
	Not Belted	138	54	(1.09,1.19)		87	
Type of road	Belted	78	97	1.20		49	1.15 ^b (0.95,1.38)
	Not Belted	39	24	(1.03,1.41)		15	
Expressway	Belted	856	1604	1.16		1010	1.04 (1.00,1.08)
	Not Belted	183	78	(1.12,1.19)		168	
Non Expressway	Belted	220	2062	1.14		1207	0.99 ^b (0.95,1.02)
	Not Belted	0		(1.10,1.17)		502	

^a Relative Risk of 2x2 table analysis: ^bNot significant*Pattern of seat belt wearing stratified by gender*

Male drivers (83.3, 93.7, and 87.2 %) reported a consistently higher seat belt wearing rate as compared to female drivers (79.4, 84.2, and 78.9 %) before, two weeks and six months after the Ops respectively (Table 1). For Male, the increases in seat belt wearing pattern were significant for both periods of the Ops. In

contrast, for female, the increase was only significant after two weeks [RR (95% CI): 1.06 (1.01, 1.11)] of the Ops (Table 3). For front passenger, a higher seat belt wearing was observed among female than male (Table 2). For female, these increases in seat belt wearing were significant for both periods [RR (95% CI): 1.16 (1.13, 1.19) and 1.05(1.02, 1.09)] of the Ops (Table 4).

Pattern of seat belt wearing stratified by type of vehicle

When stratified by type of vehicle, results indicated that drivers of MPV/SUV (87.8, 95.0, and 90.0 %) reported a consistently higher percentage of seatbelt wearing as compared to car (81.6, 91.4, and 84.5 %) and other type of vehicle (79.8, 91.3, and 86.8) before and after the Ops respectively. The increase in seat belt wearing pattern for car drivers was significant for the both periods after the Ops with RR (95 %) of 1.12 (1.10, 1.14) and 1.04 (1.01, 1.06) respectively. However, for front passengers, the significant increased was observed only after two weeks of the Ops. For drivers and front passengers of MPV and other type of vehicle, the significant increased was observed only after two weeks of the Ops.

Pattern of seat belt wearing stratified by type of road

Seatbelt wearing status by type of road revealed that percentage of seatbelt wearing among drivers on the expressway was higher than non-expressway. The increased in seat belt wearing among drivers on expressway was significant for both periods after the ops [RR (95 %) of 1.13 (1.10, 1.16) and 1.08 (1.05, 1.011)]. Similar significant patterns were observed among front passengers on the highways (Table 4). In contrast, for non-expressway, the effect of the ops for increasing the seat belt wearing rate among both drivers and front passengers were not significant after six months of the ops.

DISCUSSION

This study revealed that seatbelts wearing among drivers and front passengers in Malaysia could have been improved as a result of the enhance enforcement activities which known as the “Ops Bersepadu” or Integrated Operation (the Ops) which was conducted at national level during the busy festive seasons in Malaysia every year since 2001. The current seatbelt wearing was 85.7 % and 76.8 % among drivers and front passengers respectively which was higher as compared to previous years. In 1993, the wearing rate among drivers was only 40 %⁸ after many years of the introduction of law in early seventy, then it increased to 76.6 % in 2003⁹. However, both studies were conducted at small scale and localized to specific areas which limit it generalizability. The later study was not

tailored toward assessing the effectiveness of the Ops of that year.

Since there was no evaluation done to study the impact of yearly integrated operation (the Ops), the incremental increase in seatbelts wearing by year could not be seen and evaluated. This study indicated that after two weeks, the Ops 12 % (RR: 1.12) and 17 % (RR: 1.17) effective in increasing the overall seat belt wearing rate among drivers and front passengers. However, after six months the effect of the ops on seat belt wearing status among drivers and front passengers reduced to 3 (RR: 1.0) and 6 % (RR: 1.06) respectively. Given the evaluation is based on an observational survey it is difficult to attribute, exactly, the extent to which the ops increased the percentage of seat belt wearing. Importantly we observed a significant increase in the percentage of seat belt wearing after the intervention. Furthermore, when the analysis was stratified for road type, vehicle type and gender of driver and front passengers, there was a consistent increase in the percentage of seat belt wearing after the ops with the magnitude of increase was higher after two weeks as compared to six months of the ops.

The declining effect of the ops over time was reported by many studies. For example, similar observations were reported in a review paper that indicates the declined trend in seatbelt wearing after a few months of enhance enforcement ended has been observed by others studies as well⁶. However, the review also reported that seatbelt wearing rates consistently remained above pre-intervention baselines level (median change +9 %, interquartile range of 7% to 14 %) despite declining trend after the enforcement ended which was similar to our observation. These findings are consistent with other studies that revealed as the enforcement activities increases, the compliance rate to seatbelt wearing would also increase and started to decline when the enforcement activities decrease over time^{11, 12, 13, 14}. However, the percentage of seatbelt wearing increased at six months follow-up was smaller in this study, which may indicate that the effects of short term enhance enforcement activities on seatbelt wearing did not sustain over time. This could be due to several reasons, one could be the approach taken during the Ops that primarily focus on traffic offences like speeding, red light running, and dangerous overtaking and driving under the influences of alcohol and drugs, whereas, seatbelt wearing was not the primary target. This was different

with other studies where the enhance enforcement was conducted specifically focus on seatbelt wearing^{11, 15, 16, 17}. Furthermore, to be effective the enforcement needs to be selective, highly visible and well publicized, conducted over a sufficiently long period and repeated several times during a year¹⁸. As a result, perceptions of being caught by an enforcement officer for not buckle up remain low. Second, the follow up action after the operation was not clearly planned and it's seem just like one off activities. Although, the fine imposed during the Ops was higher, it was reduced back to normal practice after the period of the Ops. The element of covert enforcement approach adopted by the traffic police after the Ops could have also influence the sustainability of seatbelt wearing among front occupants.

Limitation of the study; the effect of the Ops cannot be confirmed for certain in this study, as there was no comparison group involved. As the implementation of the ops was announced for the whole nation through mass media, the whole nation was assumed to have been exposed to the enforcement activities. The public perception of being caught by the enforcement officers would be higher during the ops period regardless of their time and location as the enforcement officers were scattered through out the nation using covert enforcement strategy. Based on that reason, it was impossible for us to find a control group for evaluating the effectiveness of the ops. Other limitation includes; the observations were restricted to daytime, therefore the results were not able to represent the pattern of seatbelt wearing by time.

CONCLUSION

This study sheds light on the importance of enhance enforcement programme for increasing the seatbelt wearing in Malaysia. However, in order to give more impact on seatbelt wearing, the strategy for enhance enforcement programme in Malaysia may need to be revised. Additional efforts to maintain continuous enforcement level over several weeks or months and focus primarily on seatbelt wearing may improve seatbelt wearing rate. Because lack of enforcement officers is always noted as the reason for poor enforcement activities, the media can be used to advocate and promote the seriousness and visibility of the enforcement activities. In addition to that, penalty imposed on those who do not buckle up should be increased and the practice of giving discount for paying their

fines should be stopped. Social marketing activities should be strategize to address not only on knowledge about benefit of seatbelt wearing but more important is to increase the public awareness about enhance enforcement activity so that the perception of being caught by an enforcement officer could be increased.

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