Intervention To Increase Seat Belt Use At A Primary Care Center

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Abstract: ***Background:*** **Increasing seat belt use represents an ideal opportunity for preventive health care in family practice. Little evidence exists, however, that primary care physicians can increase safety belt use.**

Methods: **Three hundred twenty-six patients seen in a rural primary care center were randomized to either a control or intervention group. Before their health care examination, patients completed a short questionnaire concerning seat belt use and then viewed a 6-minute videotape explaining reasons to wear seat belts (intervention) or espousing general preventive health care guidelines with no mention of seat belts (control). In 6 months the questionnaire was again administered with no further intervention.**

Results: **Two hundred forty-three (74.5 percent) patients completed both baseline and 6-month questionnaires. Seat belt use increased significantly from baseline to 6 months for the intervention (22 to 37.3 percent, $P = 0.00052$) and control (20 to 33.6 percent, $P = 0.00085$) groups; however, the difference between the increase in the intervention (37.3 percent) and control (33.6 percent) groups at 6 months was insignificant ($P = 0.641$). The most common reasons for not using seat belts were forgetfulness (40.3 percent), fear of being trapped (26.7 percent), and lack of comfort (21.8 percent).**

Conclusions: **Seat belt use increased in this study, although the intervention videotape was no better than the control videotape at increasing restraint use. This increase in use supports office-based intervention to improve seat belt use, but further research is needed to clarify the mechanism and extent of change possible.**
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Seat belt use has been conclusively shown to reduce morbidity and mortality in motor vehicle accidents.[1-4] Because accidents are the fourth leading cause of death in the United States, and motor vehicle accidents account for more than one-half of these deaths,[5,6] increasing the use of safety belts represents an important method to decrease needless loss of life. Various sources, including the *Guide to Clinical Preventive Services*[7] published by the US Preventive Services Task Force, have advised physicians to counsel their patients on the use of safety belts.

Unfortunately, physician intervention to increase safety belt use has been inadequately studied. The best evidence for physician action effecting a change in vehicle restraint use has been in children, but the results have been inconsistent.[8-10] Also a recent survey of family physicians found that only 5 percent of family physicians routinely ask their patients about seat belt use.[11]

Findings from a recent questionnaire study indicated that a brief intervention by a physician during an office visit could increase reported safety belt use, but the study was uncontrolled and had a very selected patient population.[12] This study attempts to increase seat belt use through a randomized, controlled intervention trial using a videotaped teaching model. A videotape model has been used successfully for instruction in Coumadin™ use and offers the advantage of a simple method to deliver a consistent, personalized message.[13]

Methods

This study was conducted at a federally funded state-regulated primary care center. The patient population was primarily indigent with the majority of patients receiving their care on a sliding scale fee system. The population was rural and 98 percent white.

The study period was between June 1989 and January 1990. Patients were recruited for the study during routine office visits between June

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and August 1989. Patients were included in the study population if they were between the ages of 14 and 60 years, signed a statement agreeing to allow the author to contact them in 6 months for follow-up, and agreed to watch a 6-minute patient education videotape.

Patients were excluded from the study if they were acutely ill (temperature > 101.0°F, severe pain, mental status changes, or other acute distress), refused to sign a release, or were unable to comprehend the intervention (intellectual impairment or psychosis).

Patients were assigned to intervention or control groups using random number tables. Nursing staff then asked patients to answer a short questionnaire that inquired whether they wore safety belts. The patients recorded their seat belt usage on a linear scale.

Patients who reported wearing their seat belts less than 90 percent of the time were asked whether certain common reasons for nonuse of their seat belts applied to them: (1) I don't believe wearing my seat belt would keep me from being hurt or badly injured if I were in an automobile accident, (2) I forget to put on my seat belt, (3) seat belts are too uncomfortable to wear, (4) if I wear my seat belt, I might get trapped in the car, (5) my car does not have a seat belt, (6) I only drive around town and I don't need my seat belt then, (7) I don't believe an accident will happen to me, and (8) other (please explain).

Patients who reported wearing their seat belts more than 90 percent of the time were asked whether certain common reasons for use of their seat belt applied to them: (1) I believe wearing my seat belt improves my chance of surviving in an accident, (2) it is a state law to wear my seat belt, (3) a loved one makes me wear my seat belt, (4) my job requires me to wear my seat belt, and (5) other (please explain). Patients who could not read (approximately 10 percent) were assisted by the nursing staff in filling out the form; otherwise, no special explanation was given to the patient.

Patients were then shown a 6-minute intervention or control videotape while waiting to see their health care provider. The intervention tape showed me explaining the magnitude of the problem of automobile accidents and discussing the impact of seat belt use on reducing injuries and death. I then addressed common misconceptions concerning seat belt nonusage including the reasons mentioned in the questionnaire for not wearing a seat belt. Finally the family nurse practitioner at the center gave an emotional appeal to all patients in the intervention group to wear their seat belt based on her strong personal conviction.

The control videotape was a 6-minute discussion of preventive health care and screening with no mention of seat belts. Patients were asked to direct any questions concerning seat belt use to their health care provider during the office visit.

Six months after the baseline questionnaire, patients were contacted by a series of three mailings and given a follow-up questionnaire identical to the baseline questionnaire. Patients who did not respond to the mailings were contacted by telephone, if possible.

The data were analyzed using the chi-square statistic for independent sample comparison and the McNemar statistic for comparison of paired samples. Comparison of groups for age used the t-test for the comparison of two independent means. A prior significance level was established at $P < 0.05$.

Results

Three hundred twenty-six patients completed the initial questionnaire on seat belt use and were randomized to the intervention (n = 161) or control (n = 165) group. At 6 months, 243 (74.5 percent) completed follow-up questionnaires, including 118 intervention patients and 125 control patients. The 83 patients (25.5 percent) lost to follow-up included 1 patient who died, 5 who on further review failed to meet inclusion criteria, and 77 who could not be contacted.

The mean age was 30 years in both the control and intervention groups. The population was all white and predominantly female. There was no significant difference between the two groups at baseline (Table 1). There was no significant difference between those with greater than 50 percent seat belt use in the final study group (111 or 45.7 percent) and those lost to follow-up after completing the initial questionnaire (37 or 44.6 percent).

Seat belt use increased from baseline to 6 months in both the intervention and control groups regardless of whether the seat belt user was defined as one who wore his or her seat belt more than 50 percent or 90 percent of the time

Table 1. Comparison of Intervention (n = 118) and Control (n = 125) Groups at Baseline.

Characteristics	Intervention No. (%)	Control No. (%)	*P* Value
Mean age (years)	30	30	NS
Female	91 (77.1)	86 (68.9)	0.189
White	118 (100)	125 (100)	NS

NS = not significant.

(Table 2). Comparison between the control and intervention groups at 6 months revealed no significant differences in seat belt usage rates (Table 3). The increase in seat belt use was highly significant, however, when baseline use was compared with 6-month follow-up use within the intervention and control groups (Table 4).

The explanations for nonuse of seat belts were varied and changed little with intervention even though reasons for not wearing a seat belt were addressed in the intervention videotape. The most common explanation for nonuse was forgetfulness (41.6 percent at baseline, 40.3 percent at 6 months), whereas fear of being trapped (29.2 percent at baseline, 26.7 percent at 6 months), lack of comfort (29.2 percent at baseline, 26.7 percent at 6 months), and a belief that seat belts do not help (10.3 percent at baseline, 10.3 percent at 6 months) were also mentioned frequently.

The explanations for use of seat belts primarily related to the belief that seat belts improve one's chance of surviving an accident (24.3 percent at baseline, 33.3 percent at 6 months) and to the state law in Tennessee mandating seat belt use (14.8 percent at baseline, 26.3 percent at 6 months). There was an increase in all reasons given for wearing a seat belt in both the intervention and control groups.

Table 2. Rate of Seat Belt Use at Baseline and After 6 Months for Intervention (n = 118), Control (n = 125), and Both (n = 243) Groups.

Percent Seat Belt Use	Intervention No. (%)	Control No. (%)	Both No. (%)
Baseline			
⩾ 90	26 (22.0)	25 (20.0)	51 (21.0)
⩾ 50	54 (45.8)	57 (45.6)	111 (45.7)
6 months			
⩾ 90	44 (37.3)	42 (33.6)	86 (35.4)
⩾ 50	74 (62.7)	74 (59.2)	148 (60.9)

Discussion

This study showed an increase in reported seat belt use in both the intervention and control groups. There was no significant difference between the increase in the control group compared with the increase in the intervention group, which suggests that the intervention as originally designed was not responsible for the increase in seat belt use. Both groups, however, had statistically significant increases in reported seat belt use at the 6-month follow-up. There are several possible explanations for this increase.

Table 3. Rate of Seat Belt Use between Intervention (n = 118) and Control (n = 125) Groups After 6 Months.

Percent Seat Belt Use	Intervention No. (%)	Control No. (%)	*P* Value
⩾ 90	44 (37.3)	42 (33.6)	0.641
⩾ 50	74 (62.7)	74 (59.2)	0.668

One explanation is self-report bias. The Centers for Disease Control data suggest that self-reported use of seat belts exceeds observed use by approximately 25 percent.[14] In this study self-report bias should be present in the two groups at both the baseline and 6-month periods. Thus, the tendency toward increased use should be unaffected. Patients could have become more convinced of the need to present positive results at the end of 6 months, however, because of the increased effort made to get follow-up information (three mailings and telephone calls if there was no response to the questionnaires).

Another possibility is that patients who were lost to follow-up were less likely to be wearing their seat belts, which skewed the results toward increased use. Baseline seat belt use in the final study group was similar to that of the group lost to follow-up, which suggests that the group lost to follow-up is unlikely to represent a special subpopulation. No one refused to answer a follow-up questionnaire when contacted, although 77 (23.6 percent) were unable to be reached. Perhaps the most likely reason patients were lost to follow-up was that addresses changed frequently, and many participants in this indigent rural population did not have telephones.

There was no change in the state law regarding seat belt use in Tennessee during the study period, although there was an increase in seat belt use

Table 4. Rate of Seat Belt Use between Intervention (n = 118) and Control (n = 125) Groups at Baseline and After 6 Months.

Percent Seat Belt Use	Intervention			Control		
	Baseline	6 Months	*P* Value	Baseline	6 Months	*P* Value
≥ 90	26 (22.0)*	44 (37.3)	0.00052	25 (20.0)	42 (33.6)	0.00085
≥ 50	54 (45.8)	74 (62.7)	0.00019	57 (45.6)	74 (59.2)	0.00297

*Values in parenthesis represent percentage of totals.

from 38 percent to 42 percent from a 1989–1990 survey (unpublished data, Tennessee Department of Health). This increase in reported use was not nearly as dramatic as the increase found in this study, although the trend in society for greater seat belt use could have had some effect on the study results.

Another explanation is that patients actually did increase their seat belt use. The lack of effect for the proposed intervention could reflect the method of measuring seat belt use. By asking patients whether they wear their seat belts and then asking specific questions about reasons for seat belt use or nonuse, the questionnaire itself functions as an intervention; therefore, all patients who answered the questionnaire were, in effect, receiving an intervention. Unfortunately, without a control group that did not receive the questionnaire, final judgment concerning this explanation cannot be made.

The intervention as designed was not responsible for the increase in seat belt use. Rates of seat belt use for the control and intervention groups were remarkably similar at baseline and at 6 months. Explanations for the ineffectiveness of the intervention include the wrong type of information, no incentive for change, the videotape model was not sufficiently personal, a single patient exposure to the intervention was inadequate, the time between baseline and measuring effect was too long, and the strength of the questionnaire functioning as an intervention overshadowed any effect of the videotape.

The most common reason for nonuse of seat belts in this study was forgetfulness, followed by statistically invalid beliefs and concerns that seat belts are too uncomfortable. If the primary problem is forgetfulness, then any reminder could be adequate to increase use. Reminders and incentives have increased seat belt use significantly.[15-18] One study suggested that most persons do not have strong beliefs against seat belt use; they merely fail to acquire the habit of seat belt use.[19] This information suggests that factual information dispelling wrong beliefs, such as that found in the intervention, do little to change behavior. Discomfort also has been shown to be a common explanation for nonuse, and the intervention did not address this problem.[20-23]

The initial increase in seat belt use has been reported to decline rapidly after only a few months.[19] In this study, greater effect would have been likely if follow-up was performed earlier but would be unlikely to represent long-term changes in behavior. Unfortunately, observational studies that are unable to follow seat belt use for a long period would also be unlikely to reflect long-term behavior changes. Documenting that patients leave their physician's office wearing their seat belts would not necessarily predict seat belt use 6 months later, so simple observational studies would be inadequate to document the long-term effects of intervention.

Reward-based interventions have been effective in increasing seat belt use. One study in a hospital environment used a monetary incentive to increase seat belt use significantly while another used the reward of a soft drink in a fast food restaurant to increase use.[17,18]

This study has several weaknesses. The patient population was fairly homogeneous and was skewed to the rural indigent population. People with higher education and income levels are more likely to wear seat belts, so without that population represented, the ability of this intervention to effect change is reduced.[22,23] Without an observational component to surveillance, it is difficult to validate reported seat belt usage rates. Again, self-report bias is a concern, although repeated observations might be necessary to establish an individual's change in seat belt use. Although this study was randomized and controlled, the effect of the questionnaire as an intervention could have effectively eliminated the control group, which would leave the study without a control group and

therefore raise questions about the validity of conclusions concerning increases in seat belt use.

Conclusion

Seat belt use increased in this study, although the intervention as planned was not responsible for the increase. Other studies have shown that a simple reminder by a physician can cause some patients to quit smoking.[24-26] The results of this study indicate the use of seat belts can be increased, but the specific intervention required is still unknown, as is the amount of change possible. Further study should focus not only on other types of intervention that can effect change, such as a simple verbal reminder at each office visit, but also on a mechanism to measure change without introducing a bias that weakens the value of the control group. In spite of certain weaknesses, this study suggests that seat belt use can be increased by office-based intervention. Physicians should encourage their patients to wear their seat belts and make inquiry into seat belt use a routine part of their preventive health care.

References

1. Newman RJ. A prospective evaluation of the protective effect of car seatbelts. J Trauma 1986; 26:561-4.
2. Campbell BJ. Safety belt injury reduction related to crash severity and front seated position. J Trauma 1987; 27:733-9.
3. Orsay EM, Turnbull TL, Dunne M, Barrett JA, Langenberg P, Orsay CP. Prospective study of the effect of safety belts on morbidity and health care costs in motor-vehicle accidents. JAMA 1988; 260:3598-603.
4. Final regulatory impact analysis: amendments to federal motor vehicle safety standard no. 208 occupant crash protection. Washington, DC: Department of Transportation, 1984. (Publication no. DOT HS 806-572.)
5. National Center for Health Statistics. Advance report of final mortality statistics, 1986. Monthly Vital Statistics Report [Suppl]. Vol. 37. no. 6. Hyattsville, Md.: Public Health Service, 1988. (Publication no. DHHS (PHS) 88-1120.)
6. Conn JM. Deaths from motor vehicle-related injuries, 1978-1984. MMWR 1988; 37(SS-1):5-12.
7. Guide to clinical preventive services: an assessment of the effectiveness of 169 interventions: report of the US Preventive Services Task Force. Baltimore: Williams & Wilkins, 1989.
8. Macknin ML, Gustafson C, Gassman J, Barich D. Office education by pediatricians to increase seat belt use. Am J Dis Child 1987; 141:1305-7.
9. Hletko PJ, Robin SS, Hletko JD, Stone M. Infant safety seat use. Reaching the hard to reach. Am J Dis Child 1987; 141:1301-4.
10. Reisinger KS, Williams AF, Wells JK, John CE, Roberts TR, Podgainy HJ. Effect of pediatricians' counseling on infant restraint use. Pediatrics 1981; 67:201-6.
11. Mullen PD, Gottlieb NH, Biddle AK, McCuan RA, McAlister AL. Predictors of safety belt initiative by primary care physicians. A social learning theory perspective. Med Care 1988; 26:373-82.
12. Kelly RB. Effect of a brief physician intervention on seat belt use. J Fam Pract 1987; 24:630-2.
13. Stone S, Holden A, Knapic N, Ansell J. Comparison between videotape and personalized patient education for anticoagulant therapy. J Fam Pract 1989; 29:55-7.
14. Comparison of observed and self-reported seat belt use rates — United States. MMWR 1988; 37:549-51.
15. Williams M, Thyer BA, Bailey JS, Harrison DF. Promoting safety belt use with traffic signs and prompters. J Appl Behav Anal 1989; 22:71-6.
16. Cope JG, Moy SS, Grossnickle WF. The behavioral impact of an advertising campaign to promote safety belt use. J Appl Behav Anal 1988; 21:277-80.
17. Elman D, Killebrew TJ. Incentives and seat belts: changing a resistant behavior through extrinsic motivation. J Appl Soc Psych 1978; 8:72-84.
18. Nimmer JG, Geller ES. Motivating safety belt use at a community hospital: an effective integration of incentive and commitment strategies. Am J Community Psychol 1988; 16:381-94.
19. Knapper CK, Cropley AJ, Moore RJ. Attitudinal factors in the non-use of seat belts. Accident Analysis and Prevention 1976; 8:241-6.
20. Fhaner G, Hane M. Seat belts: relations between beliefs, attitude, and use. J Appl Psych 1974; 59: 472-82.
21. Mawson AR, Biundo JJ Jr. Contrasting beliefs and actions of drivers regarding seatbelts: a study in New Orleans. J Trauma 1985; 25:433-7.
22. Goldbaum GM, Remington PL, Powell KE, Hogelin GC, Gentry EM. Failure to use seat belts in the United States. The 1981-1983 Behavioral Risk Factor Surveys. JAMA 1986; 255:2459-62.
23. Lichtenstein MJ, Bolton A, Wade G. Derivation and validation of a decision rule for predicting seat belt utilization. J Fam Pract 1989; 28:289-92.
24. Wilson D, Wood G, Johnston N, Sicurella J. A randomized clinical trial of supportive follow-up for cigarette smokers in family practice. Can Med Assoc J 1982; 126:127-9.
25. Wilson DM, Taylor DW, Gilbert JR, Best JA, Lindsay EA, Willms DG, et al. A randomized trial of a family physician intervention for smoking cessation. JAMA 1988; 260:1570-4.
26. Kottke TE, Battista RN, DeFriese GH, Brekke ML. Attributes of successful smoking cessation interventions in medical practice. A meta-analysis of 39 controlled trials. JAMA 1988; 259:2883-9.