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# **Indigestion and heartburn: Prevalence in persons seeking care from chiropractors.**

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SHORT TITLE:  
**Indigestion prevalence and chiropractic**

### **ABSTRACT:**

**Objective:** To determine the prevalence of indigestion and midback pain in persons seeking chiropractic care.

**Design:** A cross-sectional survey using a self-report questionnaire.

**Setting:** Three primary care private chiropractic practices in metropolitan Perth, Australia.

**Subjects:** Persons seeking chiropractic care during a one month period.

**Intervention:** None

**Outcome measures:** Six-month prevalence of indigestion and midback pain. Rate of association between indigestion and midback pain. Distribution of thoracic dysfunction and manipulation. Proportion who report relief from manipulation.

**Observations:** 1494 responses were obtained from 1567 persons who consulted 8 chiropractors on 2974 occasions during November 1994. 119 persons consulted the first-time. The mean age of respondents was 41 yr. (range 10-94) and 57% were female. Fifty-seven percent reported indigestion infrequently or more and 71% reported midback pain during the prior six months. 46% experienced both symptoms during this time. Of these 36% reported the symptoms together at some time. 22% of those with indigestion reported some relief after chiropractic manipulation. Compared to those reporting no relief, midback pain is more common amongst those reporting indigestion. The level of manipulation given was unrelated to relief. No major differences were noted between the three clinics in patient demographics, nor relating to the main outcome measures.

**Conclusions:** Indigestion and midback pain are commonly experienced in this population. A person reporting indigestion is more likely to also experience midback pain. Relief of indigestion by manipulation is more common amongst those who report midback pain. Further research is needed to understand differences between subgroups and compared to other studies.

### **Key Indexing Terms:**

Indigestion, heartburn, dyspepsia, back-pain, chiropractic, prevalence

### INTRODUCTION

The proportion of chiropractic care dealing with non-musculoskeletal conditions has shown a steady but moderate decline in recent years(1 ). Upper abdominal pain, indigestion, heartburn or colic are symptoms that suggest an underlying visceral 'cause'. These symptoms are experienced by up to 40% of adults(2 ). No visceral pathology can be found in three-quarters of these(2) and psychological or social origins are then supposed(3 ,4 ,5 ).

Classic chiropractic theory predicts that spinal dysfunction can cause indigestion and heartburn. Biological plausibility for this link exists experimentally. Altered gastric acidity and ulceration occurs in rabbits and cats when spinal dysfunction is induced(6 ). Clinical evidence for this link also exists. Faster healing times of duodenal ulcers have been noted in human subjects receiving spinal manipulation(7 ). A study of colic in infants also indicates relief can be gained from chiropractic care(8 ). Indigestion and heartburn are the fifth most common 'non-musculoskeletal' presenting complaints to chiropractors (9 ) and account for about 1%(10 ) of new patient complaints.

A reverse association also needs to be considered - where viscera are responsible for spinal symptoms. Midback pain can accompany gastric or duodenal ulcers(11 ) and may be referred from pancreatic disease (12 ). The proportion patients with thoracic pain as a presenting complaint in chiropractic practice is estimated at somewhere between 4-18% (10,13 ,14 ,15 ,16 ).

Our objective was to estimate the prevalence of indigestion and midback pain. We further hypothesized that if the spine has an influence on visceral conditions then indigestion should be associated with thoracic spinal pain. As a first approximation, we decided to study only persons seeking chiropractic care.

### METHOD

A cross-sectional survey was conducted of persons over the age of ten who sought care at three chiropractic clinics situated in the Perth metropolitan region during the month of November 1994. They were questioned about their experience of indigestion, heartburn or midback pain during the immediate past six month period. The survey instrument was refined by

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successive review by the chiropractors at one of the clinics and from feedback from selected patients in the six weeks prior to the formal data collection period. The instrument was arbitrarily limited to one A4 side for patients, similarly for practitioners in order to minimize impact on clinic operation. Responses were sought from both patients and their treating chiropractor (table 1). Chiropractic assistants maintained a list of persons visiting each clinic, the return of the questionnaire and whether anyone refused to complete the questionnaire. Patients were informed of the purpose of the study and offered a report of the study findings. The questionnaire also contained an option for a person to request that no information be used from their files for the purpose of the study.

At one clinic three practitioners operated part-time hours in addition to a full-time practitioner. At another clinic one practitioner operated restricted hours and another operated full-time. The third clinic was operated by a sole practitioner. The number of years in practice ranged from 1 to 19 (mean 8 yr.), and five graduated from Royal Melbourne Institute of Technology, one from Palmer and National College each. In all cases the practices had been operating for a number of years under different practitioners or at different locations (table 2). Practitioners volunteered to participate following discussion with the first author.

One thousand five hundred sixty seven persons visited these three Perth metropolitan chiropractic clinics for 2974 consultations during the month of November 1994 (table 2). Forty-two individuals were aged under ten years, in another 22 instances forms were not completed. Nine individuals refused to complete the questionnaire. This meant 1494 questionnaires were available for analysis which represents 96% of all possible subjects. Only one subject specifically requested a report of the findings.

Fifty-seven percent of the respondents were female and the mean age was 41 yr. The distribution of age and sex were similar amongst persons visiting the three clinics (table 2). One hundred nineteen individuals sought care for the first time. For persons receiving subsequent care, the mean duration between the first consultation and completing the questionnaire was 5 years and was influenced by the length of time each clinic had been operating (table 2). The reasons for first seeking chiropractic care are listed in table 3

### RESULTS

Fifty-seven percent of the study group experienced indigestion or heartburn in the six months prior to responding to the questionnaire (table 4). Midback pain was reported by 71%, and 46% experienced both midback pain and indigestion. Eighteen percent denied experiencing either symptom during the last six months.

Stomach-related symptoms were recorded in only 0.3% cases at the reason for the first visit (table 3). Of the 119 first-time consultations, 2 were specifically for indigestion or heartburn. Indigestion was recorded in 3 more cases as part of the first consultation notes. Practitioners identified that progress notes showed indigestion in a further 9.2% of cases. Forty-two percent of these persons admitted experiencing indigestion over the last six months.

Twenty-two percent reported gaining relief from indigestion after chiropractic care, and 34% used medication for relief (table 5). Relief of indigestion from manipulation was experienced primarily amongst those who also reported midback pain during the previous six months (table 6). The treating chiropractor was aware of relief in 24% of those reporting adjustment-derived indigestion relief. Practitioners noted in 30 instances that patients had sought relief over a mean of 5 yr. (range 1-20), and in 14 cases patients had specifically requested spinal adjustments to relieve their indigestion - some on over 20 separate occasions.

Midback pain, or thoracic problems accounted for 5.9% of first-time consultations compared to 9% of all cases. Forty nine percent of new patients admitted to experiencing midback pain over the prior six months. Seventy-one percent of the total group experienced midback pain during the last six months.

Forty six percent of persons experienced both midback pain and indigestion, while 19% denied both symptoms in the last six months. The proportion of those reporting indigestion together with midback pain (46%) is nearly twice that of those who deny midback pain (25%) (table 4). This association is greater than is likely to occur by chance alone ( $\chi^2 = 101$ ,  $p < 0.0001$ ). Amongst only first time patients the report of indigestion and midback pain shows a similar relationship ( $\chi^2 = 7.65$ ,  $p < 0.006$ ). Of those with both indigestion and midback pain over this period 33% reported these symptoms occurred together to some extent. Nearly half the respondents specifically denied such an association (table 7).

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Adjustments (chiropractic manipulation) to the thoracic spine was provided to 74% (1111/1494) of all persons seeking care. The T4-T8 levels of the thoracic spine were the most frequently manipulated levels, and also those exhibiting the most tenderness and fixation. The thoracic levels at which adjustments were directed are listed in table 8, with separate tabulation for those with and without indigestion, with and without mid-back pain and those with both symptoms or neither. Relative 'anteriority' or local regions of apparent surface kyphosis was noted in 8.4% of cases, and of these 69% had indigestion. 'Anteriority' was noted in 11% of those who gained relief from manipulation.

### DISCUSSION

The point prevalence of these symptoms should have been assessed together with the six-month prevalence. Depending on the definition used, it is estimated that the six month prevalence of heartburn in Western countries is 20-40%(2,17 ). Our finding is similar to this range if only first-time patients are considered. For all respondents, our finding is much higher (57%), even if standardized by age (54%) to the Perth population(18 ) using the direct standardization method.

To explain this we can say those who seek chiropractic care are different from the general population in that they already suffer from symptoms, or spinal problems. A cynical interpretation would be that spinal manipulation causes indigestion as shown by the greater prevalence in continuing patients! It could also mean that those who seek chiropractic care represent a filtered group, perhaps pre-screened for severe pathology, and who self-select because they have experienced temporary but adequate relief from chiropractic care. Additionally this observation was made at selected sites which may not hold true for the Australian or total Perth population. Apart from a random or stratified survey, replication at different locations with similar results would confirm this finding. Other reasons for this difference could be the type of questionnaire and wording used. We included all reports of indigestion for this figure. The clinic environment and timing of questionnaire completion around the time of consultation may also influence responses. Specific questioning is likely to result in an over-report of symptoms, as in an halo effect. Conversely memory of symptoms diminishes with time so that accurate estimates

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of frequency are unlikely(19 ) and the extent of current pain or its course influences memory of prior symptoms(20 ).

Our study shows indigestion is an uncommon reason for a patient to seek chiropractic care initially even though it is a common symptom. Perhaps indigestion is considered a normal consequence of life. Being vague or intermittent, indigestion is likely to be underreported unless specifically requested. Indigestion was reported equally by men and women ( $\chi^2 = 1.23$ , NS). Further post hoc analysis showed that persons older than 30 years of age were more likely to report indigestion ( $\chi^2 = 10.7$ ,  $P < 0.001$ ). Once under chiropractic care 23% of indigestion sufferers reported experiencing some or complete relief of their indigestion. Relief of indigestion was experienced in similar proportions across age groups ( $\chi^2 = 6.6$ , NS), and according to sex ( $\chi^2 = 2.91$ , NS).

As a presenting complaint, thoracic back pain in our sample was similar in proportion to some studies (13,21 ) but less than in others (14,16). As expected the six month prevalence of midback pain was higher at 49% amongst first-time patients and 71% amongst the whole group. This figure is only slightly lower when standardized for age based on the Perth population - 70.4%. The difference between first time and all subjects requires further study. We found midback pain was reported more by those in the age group 20-50 ( $\chi^2 = 32.6$ ,  $p < 0.00001$ ) and more women experienced midback pain ( $\chi^2 = 21.5$ ,  $p < 0.00001$ ). No reliable data is available to indicate what proportion of this group actually had an identifiable 'visceral' pathology, nor what proportion experienced midback pain as a consequence.

The association between indigestion and midback pain in this study population supports the clinical experience of having a good chance of predicting indigestion in a person who seeks care for midback pain. To gain further credence for this association we need to demonstrate such an association in those who do not seek care - as we know that the healthcare system and individual beliefs can influence healthcare choices. Secondly there may be different associations amongst those who seek care from other types of practitioners. We found no differences between the three clinics for indigestion ( $\chi^2 = 0.9$ , NS) or midback pain ( $\chi^2 = 3.7$ , NS). Causal links should not be inferred from these results. The strength of the association is open to question based on the limitations of the method and the earlier comments.

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The relief of indigestion by manipulation was more common in those with midback pain (table 6). This result also needs to be interpreted with caution because one practitioner identified some patients who misinterpreted the question of relief. They had responded as though the question related to their midback pain. To check the extent of this misunderstanding, we found that 5% of those who denied indigestion reported some or complete relief from chiropractic care. These errors were more marked in clinic B than the other two clinics (23 vs 6 and 1). The four persons who denied both indigestion and midback pain, but reported complete relief were excluded from this analysis. Apart from over-reporting and response errors, this result may reflect the purposefulness of practitioners when faced with midback pain.

On the question of concurrent experience of indigestion and midback pain, the option of 'never' was inadvertently omitted from the questionnaire, and most people chose 'rarely'. Some others wrote 'never' on the form. To account for this we only included responses more than 'sometimes' in our estimate. In this context this one third of the sufferers of indigestion were able to report experiencing both indigestion and midback pain at some time.

We created a dummy variable for both indigestion and midback pain. For each, weighted calculations of intensity and frequency were combined to give an overall estimate of severity. Where respondents marked two levels of intensity to indicate that it varied, or was between the categories provided, we always coded the lesser category. Correlation between the severity of indigestion and midback pain was low ( $r=0.32$ ). Indigestion severity was not different when analyzed by sex (Kruskal-Wallis  $H = 0.28$ ,  $p=0.7$ ) nor by age group (K-W  $H = 8.9$ ,  $p=0.18$ ). Correlation between indigestion severity and age was also low ( $r=10.0$ ). For mid back pain there was no difference when analyzed by age group (K-W  $H=5.5$ ,  $p=0.47$ ), but males showed a lesser median value for midback severity (K-W  $H = 0.038$ ). There was no correlation between midback pain severity and age ( $r=0.02$ ). The severity of reported midback pain was no different between those reporting relief of indigestion and those with no relief from manipulation (K-W  $H=1.64$ ,  $p=0.43$ ). Indigestion severity was greater in those reporting relief from manipulation than those with no relief (K-W  $H=4.34$ ,  $p=0.037$ ).

Adjustments to the thoracic spine were much less frequently applied when neither symptom was present, though not absent as might be expected (table 8). This level might

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reflect the chiropractors estimate of 'adjustable' thoracic subluxations in an asymptomatic region of the spine. The findings of tenderness, fixation or "anteriority" may be influenced by predilection of practitioners for particular findings they need to justify adjusting the spine. Interestingly more adjustments were provided than indications listed - but this perhaps reflects the time needed by practitioners to complete the form, or the difficulty in completing this section. For each subanalysis of the thoracic area the T4-T6 region reveals more dysfunction, and more intervention - regardless of the presence of indigestion or midback pain. This could indicate that this area is more prone to dysfunction because it is just above the apex of the thoracic kyphosis, or that it is easier to find problems and provide an adjustment. The spread of adjustments provided to those reporting relief from their indigestion was similar to those without either symptom and to the spread of findings. This suggests that indigestion and indigestion-relief does not depend on the segment adjusted, or that the impact of adjustments is diffuse by virtue of complex biomechanics or intricate neurological connections.

In addition to a placebo effect several physiological hypotheses can be proposed to explain the association between the spine and indigestion or why spinal manipulation might reduce indigestion.

1. Visceral afferent stimulation could cause referred midback pain (11,12) and perhaps reflex spinal muscle spasm and joint dysfunction.
2. Painful or non-painful spinal dysfunction results in the perception of visceral pain - effectively 'pseudovisceral pain' (26).
3. Spinal dysfunction could affect the health of visceral tissue - reducing 'resistance' to say ulceration (7). Midback pain might be a local effect of the spinal dysfunction.
4. Spinal dysfunction might affect the mechanics of the rib cage and diaphragm, so that relief is mainly for symptoms related to minor hiatus hernia rather than neural effects or tissue changes.
5. Non-specific endogenous opiate release after manipulation (7)

There is probably little controversy regarding the first hypothesis. In this study, persons experiencing indigestion were moderately more likely to also experience mid-back pain than persons without indigestion. Knowing more about the relationship between midback pain and

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upper abdominal pain or life-threatening gastrointestinal disease will assist to determine referral for emergency care.

The plausibility of the other hypotheses is partly supported by the observation that in up to 75% of indigestion or heartburn sufferers no ulcer pathology can be found. Stress is thought to be a factor in explaining non-ulcer dyspepsia, though research evidence is scant(22 ). Spinal dysfunction could be one such stressor. The paucity of visceral afferent fibers combined with disproportionately large number of spinal cord neurons that respond to visceral afferent stimulation(23 ) illustrates the potential for an interaction between the spine and viscera. This is supported by the observation that anterior chest pain or pseudo-visceral conditions can result from thoracic spine problems(24 ,25 ,26 ). The finding of Pikalov and Kharin (7) supports the third hypothesis but, being preliminary, no mention is made of thoracic pain in either group and spinal dysfunction is not differentiated by group nor reported as an outcome measure. More information is needed to assess the role of the fourth hypothesis. The fifth hypothesis is supported by the even distribution of the responses to manipulation and the levels of thoracic dysfunction in this study.

Response of viscerally-related symptoms to spinal manipulation occurs in a small group of patients, but in more than those who seek specific relief of visceral symptoms. The relief of these symptoms is more common in those with spinal symptoms and occurs in more than those where the chiropractor is aware of relief. Unexpected relief of visceral symptoms following spinal manipulation could prompt a patient to report it to their medical practitioner or perhaps for chiropractors to overestimate the visceral impact of their intervention.

The results of this study, though limited in scope and subject to cautious interpretation, support the belief of chiropractors that their interventions are useful for some viscerally-related symptoms even in the face of this belief being perceived as an impediment to government support(27 ). In this light infantile colic and hiatus hernia are both considered suitable for referral to a chiropractor by a group of chiropractors(28 ). Consensus amongst medical practitioners for referral to chiropractors is low even for musculoskeletal conditions(29 ), let alone viscerally-related symptoms.

### CONCLUSIONS

Amongst these persons seeking chiropractic care, midback pain and indigestion are common symptoms experienced in a six month period. Those who report midback pain are more likely to also report indigestion, and a smaller group report feeling the symptoms at the same time. Persons seeking chiropractic care frequently report indigestion, but seldom communicate it to their chiropractor and rarely seek treatment for it specifically, unless they have noted its prior relief from adjustments.

A small, but not insignificant, number of persons report complete or partial relief of indigestion from spinal care. Treating chiropractors are aware of less than a third of those who report relief. Indigestion and relief appear unrelated to specific levels or region of thoracic dysfunction. Relief from chiropractic adjustment does not appear to favor any age group or sex, but is more common if accompanied by midback pain.

Differing six month prevalence rates in first-time and the total group for both symptoms warrants further investigation.

## **ACKNOWLEDGMENTS**

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Table 1

### Questions asked of patients and practitioners

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#### *Patients Section*

1. Over the last six months how often have you suffered from indigestion or heartburn? (Response set Daily-Infrequently and included severity scale: mild, moderate and severe)
2. Over the last six months how often have you felt pain between the shoulder blades (midback area)? Response set: none, daily to infrequently, and severity scale: mild, moderate and severe)
3. How often do you have indigestion or heartburn together with your back pain?
4. How useful is each treatment for your indigestion or heartburn? (Response set: Chiropractic, Medication (open list) and for each options of no relief, some relief and complete relief provided)
5. Subjects could illustrate on a front view of a skeleton the location of their heartburn or indigestion (figure 1)
6. Subjects could illustrate the location of their midback pain on a rear view of a skeleton (figure 2).

#### *Practitioners Section*

1. Date of first consultation.
2. Was the first consultation for indigestion or heartburn?
3. What was the main complaint?
4. Was indigestion or heartburn noted in notes of the first consultation?

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5. Was indigestion or heartburn noted in any notes of subsequent visits?
6. Regarding the visit at which the questionnaire was completed, list the spinal level at which the spinous process was noted tender, fixations noted, loss of prominence noted, or an adjustment directed.
7. Was the practitioner aware of relief of symptoms of indigestion or heartburn, and if so over how many years? How many times has a patient asked to be adjusted for these symptoms?
8. Has endoscopy been performed to your knowledge, and if so was any pathology identified?

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Table 2

### Clinic and Respondent Summary

	Clinic			Total
	A	B	C	
Location	Inner	Mid	Outer	
Years established	27	3	8	
Practitioners	4	2	1	8
Consultations	1506	1308	160	2974
Persons	738	726	103	1567
Persons < 10 years	11	31	0	42
Refused to complete	9	0	0	9
Missing	22	0	0	22
Persons > 9 years	696	695	103	1494
Refused access to file	17	18	2	37
First-time consultations	51	51	17	119
Persons returning	645	644	86	1375
Median age of patients	43	39	41	41yr
Age range(49 missing)	10-90	11-78	12-74	
Proportion female(62 missing)	61%	56%	45%	57%
Mean Years after first visit*	7.6	2.4	3.4	

\* Excludes 119 first time visits

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Table 3

Region of problem recorded as the reason for the first visit

REGION	n	%
Neck*	543	35
Thoracic	135	9
Low back	746	48
Extremity	114	7
Para-musculoskeletal	21	1
Checkup	11	.7
TOTAL	1570**	100.7
Stomach-related symptoms		0.3

\* *Includes headaches*

\*\* *More than subjects, as some report more than one reason for visit.*

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Table 4  
Indigestion and midback symptoms\*

Symptom pattern	n	Percent
Indigestion and back pain	683	46
Indigestion but no back pain	160	11
No indigestion but back pain	364	25
Neither symptom	275	19
Incomplete	12	<i>excluded</i>
Total	1494	101

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\* df = 1,  $\chi^2=101$ , p= 0.00000.

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**Table 5  
Indigestion and relief**

	n	%
i. completely by manipulation	73	9
ii. partly by manipulation	114	14
iii none by manipulation	46	6
iv. completely by medication	109	13
v. partly by medication	171	20
vi none by medication	20	2
Total Responses	843	

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Table 6

### Indigestion reported with back pain\*\*

Association	n	%
i. Always	14	2
ii. Mostly	39	6
iii. Sometimes	190	28
iv. Rarely/Never	354	52
v. Missing responses	86	13
Total Responses	683	100

\* Expressed as a percentage of those who reported both symptoms.